

Sir Aston Webb, R.A.

ROYAL GOLD MEDALLIST, INSTITUTE OF ARCHITECTS, 1905.

VOL. ME
XXXVIII

JAN. & JUNE
1905

THE BUILDER

AN : ILLUSTRATED : WEEKLY
MAGAZINE : FOR : THE
ARCHITECT : ENGINEER : ARCHÆ-
OLOGIST : CONSTRUCTOR : SANI-
TARY-REFORMER : & : ART-LOVER

CONDUCTED BY

H. H. STATHAM,

FELLOW OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

“EVERY man's proper mansion-house, and home, being the theater of his hospitality, the seat of self-fruit, the comfortablest part of his own life, the noblest of his sonne's inheritance, a kind of private principedome, nay, to the possessors thereof, an epitome of the whole world, may well deserve, by these attributes, according to the degree of the master, to be decently and delightfully adorned.”

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“ALWAYS be ready to speak your mind, and a base man will avoid you.”—WILLIAM BLAKE.

OFFICE: CATHERINE ST. STRAND: LONDON: W.C.

Printed at
Windsor House Printing Works,
Bream's Buildings, E.C.

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A Further Note on the Drawings Question.



N discussing in a previous issue the question of an architect's right in his drawings, we have already referred in passing to the different manner in which

this right is regarded by the law in other countries. It may be useful to say a word or two more on this part of the subject. It is easy to say, of course, that English law has nothing to do with the law of any other nation. But it is surely something to the purpose to show that what the English law regards as an unwarrantable and unreasonable claim on the part of architects is regarded by the law of France and Germany as perfectly reasonable and worthy of legislative support. In regard to France especially the argument is of the more

force because it is unquestionable that architecture is much better understood and much more esteemed in that country than in our own.

We have made special enquiries from two or three sources in regard to the practice in France and Germany. A correspondent, an architect practising in Paris, assures us that the judgments which have been delivered in England on this head would be regarded in France as absurd. "The law here gives the architect the absolute right to keep his drawings, and the client has not the slightest right to them, unless of course some special agreement were come to between architect and client." It is customary, however, to give the client tracings or copies of the main drawings *i.e.* the general elevations and plans, if he asks for them; but it is a custom of courtesy only, and no obligation in law. If the client wishes to have copies of detail drawings, the architect may furnish them or not as he pleases;

but if he does, he has a right to make a special charge for them, over and above his commission for carrying out the building.

The German practice, we are informed by a German architect, is that architects keep all their original drawings, specifications, papers and correspondence relating to a building. They are however bound to provide a client with one copy (tracing, lithograph, or process copy) of the drawings (we imagine this means the general drawings) if called upon to do so, without extra charge. But to this there is an important counter-obligation. The client is not allowed in any way to use these drawings for any further building operations, the arrangement being that the fee for the architect's services is for the specific work carried out; and if his drawings or copies of drawings are re-used by the client, the architect is entitled to a fresh set of fees for the design as distinct from supervision. This seems rather clumsy

legislation, for the question naturally arises—*quis custodiet custodes?* If the client is not honourably disposed, who is to keep watch on him and find out whether he makes any further and illegal use of the drawings? But at all events it will be seen how different this is from the attitude of the English law, which simply, as we are now to find to our cost, orders the architect to hand over all his drawings to the client without restriction or condition of any kind.

Our correspondent in Paris makes the very sensible suggestion that it would be well for the Institute to address the "Société Centrale des Architectes Français" on the subject, and ask them for a formal and official statement of the law and custom in France in regard to drawings, with details of any cases which have been decided. The Société would, we have no doubt, be very glad to furnish this information, and the possession of it ought certainly to strengthen the hands of the Institute in seeking a reform in the English law on this subject.

For we consider that the Institute of Architects is bound to take action in the matter, and will not be able to shake off its responsibility to do so without injuring very materially its position and prestige with the profession. We know that already one important provincial society has sent to the Institute a formal demand that it should take the question up in the interests of the profession at large. And we hold that the Council are the more bound to do so, from the fact that it is very much the fault of the Institute itself that things are in this disastrous state. Without at all intending it, we consider that the Institute has a most unfortunate capacity for putting itself in the wrong with the public. In this very matter of the ownership of drawings, they have merely allowed things to slide, have given way to every fresh exaction of the law without any overt protest, and because the law seemed to be against them they have met it half way; withdrawn from their scale of professional charges expressions which implied the ownership of the drawings by the architect, and by the use of the expression that the commission is (in the first instance) for "the necessary general and detailed drawings and specifications" they have, to the eye both of the ordinary and the legal reader, to all appearance given away the case. It is true that the Council did not mean it in that sense; individual members tell us so emphatically; but they have contrived to word the clause so that it reads that way and is capable of and even invites an interpretation which would support the legal view of the ownership of the drawings. They have practically allowed the rights of the profession which they represent to be watered away.


It is surely the bounden duty of the Institute to take the first possible steps to undo that portion of the mischief which is indirectly due to their action (or inaction), by recasting the terms of the Scale of Charges, which, as they stand, are incompatible with the meaning they were supposed and intended to have; and secondly, by standing forward on behalf of the profession and endeavouring to bring about an amendment of the law. Here, no doubt, the peculiar con-

stitution of the English law seems to cause a difficulty. The "Code Napoléon" would have made short work of such a matter; it would have simply laid down what appeared to be the rights of the case and said—"This is the law." But it appears that in England no such simple procedure is practically possible. You cannot ask the House of Lords (the last refuge of appeal) to make a new enactment; you can only ask them to consider a judgment and reverse it, thereby creating a new precedent which effaces the old one. It seems a clumsy and unwieldy system, but there is apparently no getting round it. On this system, however, it is surely possible to appeal for a reconsideration of *Ebdy v. McGowan*, or a restriction of its interpretation. Here again is where the Institute seem to have completely failed us for all these years. As far as we can ascertain, they have simply taken the opinion of lawyers as to what the bearing of the law is. To a lawyer of course (not unnaturally) the law is a sacred thing; if you complain that some particular effect of legislation is unfair to you, he simply says that is the law and you cannot help it. The Institute of Architects seem all along to have been content with this; we know that they have consulted lawyers, but they have accepted the statement that the law is so-and-so, and there they have stopped. They ought to have endeavoured to show that the law was a mistake and an anomaly, based on a total misunderstanding of an architect's position; and that is what they ought to endeavour to do now. To say that it is no use, and that they do not wish to undertake an enterprise in which they are likely to fail, is a most pusillanimous policy. They ought to go on agitating about the matter until they succeed.

Whether, when the Institute Scale of Charges is revised (which we consider to be inevitable) any new principle should be introduced in regard to the case of plans made but not carried out, is a point that should be worth considering. Of course it seems perfectly illogical to say that the plans are the architect's property when the building is carried out, but that they are the client's when it is not carried out. It is an anomaly; but it does not seem to be recognised that it is an anomaly entirely creditable to the profession. Judges appear to regard architects who claim to keep their drawings as rapacious persons who want to be paid for what they do not supply. In reality, the fact that most architects are willing to hand over the drawings when a building is not carried out, illogical as it is, is really a piece of liberality; it is simply acquiesced in from the feeling that if a man does not go on with the building and pays half the commission he has got nothing for his money unless he gets the drawings. As we have before said, we think it is a mistaken policy charging for the drawings as a percentage of the commission; it would be better to make a fair charge for time and thought expended. At the same time we think that the case of charging 2½ per cent. on the estimated outlay and retaining the drawings is perfectly defensible on grounds of logic and fairness. As a rule, they do represent a

good half of the work incidental to carrying out a building. It cannot be expected that a man is to give an architect the trouble of preparing drawings and then not pay him because he (the client) changes his mind about building. In that case, why are the drawings to be given up to him? If he really does not mean to build, they are of no use to him; if he does, he has got possession of them and can hand them over to another architect if he chooses, to carry out, which is grossly unfair to the original architect; or he may think he can carry them out himself, and thereby save the rest of the architect's commission. It would be perfectly possible for an astute person with no particular sense of honour to proceed on those lines of malice prepense; to get the plans all complete and then say "I shall not build at present, but I will pay your commission for the plans," get possession of them, and carry them out with the aid of a clerk of works. If it was a building intended to have any architectural character he would probably spoil it all; but he would not know that; and he would have done a gross injury to the architect without the latter having any remedy of any kind. And after all, what is the hardship or unfairness to the client in not having the drawings? If he did not know his own mind about building when he ordered the plans to be made, that is his own fault. If he wishes to build later on, the plans are waiting for him, and he has no more to pay in the long run than if he had gone on building at once. And why is he to take possession of A's plans and be able, if he chooses, to hand them over to B.? These are points which judges and lawyers do not seem to understand; and it should be the duty of the Institute of Architects, as the representative body of the profession, to put these matters before them in a proper light, instead of sitting down meekly and allowing men to ride over their heads.

THE WINTER EXHIBITION AT BURLINGTON HOUSE.

 E cannot this year speak of the "Old Masters" exhibition, for the Old Masters, as the phrase is commonly understood, have been dismissed in favour of a representative exhibition of a painter whom future generations may, no doubt, class as an Old Master in the sense in which we now apply the expression to Vandyck or Reynolds. And a very representative exhibition it is, and a much more interesting one than some of the exhibitions of the miscellaneous works of older painters. Every side of G. F. Watts's genius is illustrated in it, and we feel able to come to some conclusion, in studying it, as to the position which the author of this great and varied life's work is likely to hold in the roll of modern English painters.

Two conclusions we arrive at are—first, that Watts's middle period was his greatest; secondly, as has been before observed in these pages, that he injured his art in his later years by regarding it too much as a Mission, and endeavouring to make his paintings

serve always the end of conveying some moral lesson. This side of his art has been far too much dwelt on and emphasised in critical reviews of his work which have appeared since his death. That a painter should consider mere artistic achievement as secondary to the desire to make people better by his painting is no doubt a very noble weakness, but it is a weakness, since it is an endeavour to make painting do what may be much better done in words, and it almost inevitably leads to the art being more or less sacrificed to the moral aim. When a painter could do and has done so many beautiful things, was it worth while to emphasise the vulgarising effect of the love of riches by so revolting a painting as "The Wife of Plutus"? a picture which no one would wish to hang in his house (or so we should have thought), and which one is chiefly desirous to forget. The real moral greatness in painting should lie in a greatness of style and feeling in the painting itself, not in the recommendation of a special lesson. Now "Love and Death," which we shall always regard as Watts's greatest and central work, is really a picture with a great moral grandeur inherent in it, but it is not a "lesson"; there is no conclusion to be derived from it that can be expressed in words; only it sets one thinking of the great issues of life, besides being grand and impressive as a design. If it were less grand in design, the meaning, so far as it has a meaning, would be the same, but it would no longer be impressive. And the same is true of the effort to put too much of allegorical meaning into a picture. We see this illustrated in the two nude figures entitled "Daphne" and "Psyche." The former, painted in 1872, has not been much exhibited, and seems to have been forgotten by many of the painter's admirers, as we have never seen any reference to it in the numerous articles that have appeared in magazines since the painter's death. It is a picture which a Greek might have painted, so perfectly beautiful is it in line and design, so statuesque in character, with perhaps, it may be admitted, a little coldness in colour as compared with the painter's later work; this however is possibly to be accounted for by the intention to give the painting a certain degree of conventional decorative character. It has no meaning or allegory of any kind; it is simply a thing of beauty. The "Psyche" in the Tait Gallery, painted at a much later period, is an attempt to symbolise in the nude figure the weakness and the tremulous nature of the soul; but the result is that the work is not beautiful; it gives a somewhat painful idea of a woman nearly destitute of life, or just about to faint away from exhaustion—"anima vagula, blandula": the "Daphne" is an attractive painting, the "Psyche" is not. In the category of works which have pure beauty for their object Watts did few things finer than "The Infancy of Zeus," which appeared, when it was exhibited at the Academy a few years ago, such a contrast to the kind of painting which he had been at that period exhibiting, that there was a rumour that it was an earlier work than first exhibited;

but we see that in the Academy catalogue it is dated 1896, so that it was a happy return to the principles of his pre-moral epoch of painting. Watts must have been a good deal under the influence of Titian in painting this picture; not only do the figures and composition recall Titian, but even the landscape background is Titianesque both in character and colour. A much earlier work which shows the same kind of beauty, though not equal to the Zeus in colour, is the small picture of an infant Ganymede, the one numbered 195 (there are two editions of it), of which the head is of wonderful beauty. This was painted in 1864; we do not remember ever to have seen it before; for pure beauty it might compare even with Raphael's cherubs in the foreground of the Dresden Madonna.

As a colourist there is no doubt that, till perhaps the very last year, Watts was progressing during his whole career. That unhappy infant covered with leather, who comes out of the sea to the query, "Whence? Whither?" is indeed an instance of failure both in regard to colour and texture, and it is a pity that it was included in the Burlington House exhibition; and it is also an example of the dangers of "moral" painting, since there can be no question that whatever interest it possesses lies in the question asked and in the enigma of life thereby suggested. We should have preferred (in painting) a more human flesh-and-blood child, with no enigma. One would almost think that it is this moral element that paralysed the painter's hand, for the "Lilian," painted the same year, has all the old beauty of colour.

The pictures which more than any others, probably, will make Watts remembered are the "Love and Death" and the "Hope." The latter picture, indeed, though most beautiful and original as a painting, has always seemed to us a poor and sad conception of Hope, and one would much more have expected it to be named "Sorrow." By whatever name, however, it is one of the few totally original things in modern art, having no precedent, and differing from everything else that one has seen in painting. There is in the collection another picture, not so universal in its appeal, but which is certainly one of the most remarkable of Watts's ideas of conceptions—viz., "The Nixies' Foster-daughter"; the human child stolen and brought up by the Nixies (whoever they are), and recalling something of her former life through finding a necklace. The face is beautiful and unusual; but what makes the extraordinary charm of the picture is its colour, which seems a kind of inspiration, and defies analysis.

The large early painting of "Time and Oblivion" (1848) is striking from its grand decorative character; one would like to see it carried out in mosaic, for which it is very well suited. Among others that we would specially dwell on is the "Ariadne" (1888) belonging to Mr. Hirsch, noteworthy as a treatment of an ancient legend of tragedy in a truly pathetic and poetic spirit; not only is the composition fine, but the head of Ariadne has a majesty of grief which

places it in quite a different category from the kind of painting of classic legend that we too often see in modern English art; the ordinary model with a classic or legendary name affixed to her. As an example of remarkably rich and harmonious colour we would draw attention to the painting of a girl looking out of a window, under the title "The rain it raineth every day"; it does not, like the colour of the "Nixies' Foster-daughter," elude analysis; you can trace out the scheme of colour and the principle on which it was worked out; but it is remarkably beautiful and perfect. The "Paolo and Francesca," too, is probably the finest illustration that painting has produced of that unhappy pair, and it is worth while to compare the large picture (180) with the small study (152), and see how greatly the expression and character of the heads has been intensified in the larger work, the smaller one being in this respect almost commonplace in comparison, though the composition is the same.

The landscapes afford a curious problem; they are so unlike landscape-painting as generally understood; so little of actual nature in them; and yet so impressive. They are in fact rather records of the sentiment of a landscape as the painter felt it, than landscape-painting, but they have a power and suggestiveness that many more finished landscape-paintings have not; they illustrate emphatically the fact that landscape painting depends upon the mind of the artist rather than on the facts of the scene.

The collection in a further room of paintings and drawings by G. F. Sandys goes to confirm our previous conviction, that the importance of Sandys's work has been somewhat exaggerated. These drawings are rather stiff in character, and show that the artist's powers were limited. What he could do best is illustrated in two or three carefully finished portraits of ladies, but on the whole the work is rather that of a man who, with original talents in art, did not get further than the initial stage of studies and drawings. Sandys would never have developed into a great painter, and he must be regarded as rather a light-weight for the Burlington House Winter Exhibition.

In connexion with this exhibition also is shown, in a separate room, a one-tenth scale model of the Victoria Memorial as intended. It is a grand work as shown here, with its sculptured terrace, and steps, and the concentric basins of water on the outside of the circle. Judging from the model, the work promises to be worthy of the occasion and of the site. But why, oh, why, was not a new façade built to Buckingham Palace, to form an architectural background worthy of the memorial?

THE LA SCALA THEATRE.—In describing a visit to this theatre by the Architectural Association (page 636 *ante*), we referred to the composition—"stucco"—in which the cornice and wall panelling were carried out, as being made and fixed by a French firm. We find that we were misled in regard to this; the tender was from a French firm in the first instance, but proved too extravagant, and ultimately the material, or something practically the same, was made and fixed by English firms.

NOTES.

SOME effort is now being made to encourage afforestation in Wales, an example that deserves the imitation of landowners in all parts of the United Kingdom. The subject is one appealing directly to architects and builders, especially in view of the fact that in a country such as the United States active steps are already being taken for the conservation of forest resources for the present and future benefit of those great industries in which timber is largely used. The necessity for stimulating efforts to perpetuate American forests as permanent resources of the nation is so strongly recognised that a congress is now sitting at Washington, under the auspices of the American Forestry Association, with the object of fostering a more intelligent appreciation of the forest in relation to the industries dependent thereon. When such a gathering is thought necessary in the United States, surely it is time that British landowners should devote attention to measures calculated to develop the possibilities of their native land and to revive an important and profitable industry.

The Aylesbury Railway Accident. TWO INQUIRIES have been held into the recent accident on the Great Central Railway at Aylesbury station—one by Colonel Yorke representing the Board of Trade, and the other by the Coroner for Mid-Buckinghamshire. It is too early to expect the report of the Board of Trade inspector, but there is little reason for believing that the conclusions drawn will be materially different from those embodied in the verdict of the Coroner's jury. The curve at Aylesbury is of such radius that the company had established a speed limit of fifteen miles an hour, and if this had not been exceeded there would have been no accident. The evidence given by two signalmen, a ganger, a platelayer, and several fognmen, makes clear the fact that the train entered the curve at an excessive speed, which was estimated by one witness at fifty miles an hour. As the driver of the train was one of the four men who lost their lives in this regrettable occurrence, it is impossible to ascertain the reason for non-compliance with the company's regulation. Probably, as the Coroner's jury believed, the fog gave rise to some uncertainty as to the position of the train with respect to the curve, and possibly the greasiness of the rails was equally responsible for the high speed of the train, by causing the wheels to skid when the brakes were applied. We are quite in accord with the recommendations that the Aylesbury curve should be modified at an early date, and that in the meantime the distant signals should be kept at danger and properly "fogged" in thick weather.

Inadequate Sea Walls. IN our "Note" of Oct. 22, 1904, we referred to the indifference exhibited by the local authorities to the protection of Sheerness. The high tide of last week affords further evidence of the danger to which the town is exposed, through the insufficient height of the sea walls. The tide then rose to fully 5 ft. above the normal

high-water level and flowed into the town, with the result that the police station and the dockyard railway station were cut off and the low-lying district, known as Blue Town, was flooded. Moreover, the water rose above the top of the dockyard sea walls, flooding that part of the yard in front of the Admiral-Superintendent's offices, and the basement of the Gunners School. On the same day some serious breaches were made in the sea wall near Minster, the wall being injured for a length of about 300 ft. and a gap formed, 30 ft. in width, through which the sea entered in large volumes and, flooding the marshes, threatened Sheerness with an attack from the rear. So imminent was the danger that the town and military authorities joined forces in temporary measures of defence by depositing sandbags in the breach. At Chitney marshes, near Queenborough, the sea walls were broken through; the tide submerged a large area of land and drowned a large number of sheep. Various factories on the banks of Queenborough Creek were flooded, and on the opposite side of the Thames the lower part of Southend was completely submerged. Occurrences of the kind show the almost inconceivable lack of foresight that prevails on the shores of the Thames estuary. In places where sea walls are built, they certainly ought to afford protection from the highest possible tides, an axiom that is understood and acted upon in Holland, a country in which coast protection works are designed by sensible men who place no reliance on chance or good luck.

The Standardisation of Water Pipes and Fittings. A COMMITTEE is now engaged in drawing up standards for regulating the sizes of waterpipes, taps, valves, and fittings throughout the country. This body, which has no connexion with the Engineering Standards Committee, includes representatives of the leading manufacturers, the Plumbers' Company, the Metropolitan Water Board, the Masters' and Operatives Plumbers' Associations, the Royal Institute of British Architects, and has the support of the Board of Trade and the Admiralty. Stated briefly, the object is to secure the adoption of standard dimensions for all pipes and fittings, both lead and iron, and for all taps, valves, and auxiliaries. In order that such a scheme may have a reasonable chance of success it is necessary that the co-operation of the various water companies and municipal water authorities should be secured, and we understand that many of these have already promised their support. But the scope of the Committee includes the regulation of other matters. It has been decided that flushing cisterns shall be provided with stop-cocks to prevent flooding, the metal to be used in the manufacture of fittings and their component parts will be specified, a sub-committee will be appointed to inspect all patterns devised. This all sounds very well in a sense, but we fear that there will be a good deal of trouble caused to householders, and a good many unreasonable demands made upon them. When we remember that one large water company refused, for reasons best known to itself, to sanction Lord Kelvin's tap within its jurisdiction—the most scientifically

designed tap of modern times, we may naturally feel a good deal of apprehension as to what may be forced upon us by doctrinaire committees on water-fittings.

Heavy Motor Traffic. NOTWITHSTANDING the recent date of the development of mechanically-propelled vans and lorries in this country, very satisfactory progress has been made, in spite of the legislative restrictions which have hampered designers and reduced the advantages of their vehicles to industrial firms. The Heavy Motor Car Order, 1904, now 'on the point of issue and to take effect on March 1, embodies the new regulations approved by the Board of Trade, will have the effect of removing some serious disabilities. For instance, the net maximum weight of a motor van will be raised from three tons to five tons, and of the van with one trailer from four tons to six and a half tons. Similarly the combined weight of the van and load is raised to twelve tons. At the same time the width of 7 ft. 6 in. will be allowed, for vans of over three tons weight. The value of these concessions will be realised by the consideration that a heavy motor van cannot be employed economically unless it displaces eight horses or runs at a speed which is objectionable from the public point of view. To guard against undue injury to highways heavy motor vehicles will have to be provided with wheel tires of ample width, the minimum being 5 in. for hard tires, and adequate springs are to be fitted between the axles and the frame. Further, speed is to be limited to five miles an hour for any van weighing more than three tons empty, or drawing a trailer, but vans of less than three tons weight may travel at eight miles an hour. The new regulations will involve considerable activity in the way of new designs, and for this reason we may not see any marked results for some months to come, but it seems certain that the industry will receive a great impetus with concurrent advantage to the general public.

Landscape Exhibition. THE exhibition of six landscape-painters, which has been an agreeable annual incident for some years, is held this year in the rooms of the Society of Water-Colour painters instead of in the Dudley Gallery. Sir E. Waterlow has succeeded from the group, and Mr. Jas. S. Hill has taken his place. There is too much tendency to dingy painting in some of these works; Mr. J. S. Hill's "Harlech," for instance, seems to have lost all the light and joy of nature; and a good many of Mr. Peppercorn's smaller works are what we should call smearing rather than painting; his trees have lost all semblance of trees, and are simply masses of pigment. Trees are not like this. His large work called "Moonlight" is more to the purpose, though it does not strike us as quite cold enough in tone for moonlight. Mr. Leslie Thomson is the finest of the six in composition; "La Pernelle, Normandy," is a grandly built-up landscape; and "Norfolk Mill," "Norfolk Marshes," and "By the Sea" are all fine works. Mr. Allan's "Ebbing Tide" and one or two other coast scenes are admirable; also his small inland scene "Amiens"

(appropriately French in style); in "Honfleur" the ships are rather too ragged in execution. Mr. Aumonier's "The Citadel, Montreuil," is one of the best in the gallery, fine both in effect and composition, in which latter point Mr. Mark Fisher is not so complete, though he shows, especially in "The Mill-Stream," his usual power of light and air effect. Composition rules the subject in Mr. Leslie Thomson's pictures; it mingles with it in Mr. Allan's and Mr. Aumonier's; it is rather lost in Mr. Fisher's; while Mr. Peppercorn's pictures are composition and little else, in the present exhibition, at least.

Exhibition at
the Dudley
Gallery.

We do not understand why the exhibition of water-colours at the Dudley Gallery is called a "Panel" exhibition, except it be for the sake of having a distinctive appellation. The works are no more "panels" than any other exhibition of water-colour pictures. The works of each artist are grouped separately, and commence with seven drawings by Mr. E. R. Hughes, of which "Perdita Found" is the best thing in the room. This is a highly-finished water-colour breathing the very atmosphere in "Winter's Tale"; the edge of a wood near the sea, where the two shepherds find the "barn—a very pretty barn," the child smiling up at them and holding up its little hands. As a Shakespeare illustration it is a complete success. Not so the chalk study of "Antonio," which does not convey the idea of the character; still less the life-size head of "Beethoven," who has suffered a good deal at the hands of painters. Among the other works Mr. Frank Mura's small landscape studies in black and white are very interesting, and have the makings of pictures in them, especially Nos. 9, 12, and 14. Mr. Thorne Waite exhibits some small landscape studies, among which "The Dover Road" is especially good, and would work out finely on a larger scale. Mr. W. Rainey's "A Ring of Roses" is a pretty group of country children dancing round in a ring. Of Mr. Russell Dowson's eleven works, two scenes at Antibes (53 and 62) are worth attention; so are Mr. Selwyn Image's drawings, despite their curious style and execution; they give rather the impression of being old drawings from some sketch-book of the eighteenth century. Mr. Frank Walton exhibits a fine study of rocks at "Pordenack Point, Land's End." Mr. Montague Smythe's works are mere sketches, but full of artistic feeling; two of them, a "Reverie" and "Solitude," seem to have been, consciously or unconsciously, done under the influence of Corot, and might very well pass for studies by that painter. Signor Giam-pietri shows his usual excellence in the treatment of bits of old Italian architecture, especially in "Steps of the Grants Fountain, Villa Lante," with its balustrade on which vases and consoles alternate to form a grandiose decoration. Mr. Robert Little's contributions are hardly up to his usual standard, except the fine sketch entitled "Belfry, Hamper Mill."

Royal Academy
Lectures.
The programme of the Royal Academy Lectures to Students for this season is now issued complete. Professor Clausen's

Lectures on Painting, which commence on the 9th, we have before drawn attention to. The further announcement is that of six lectures on Sculpture by Mr. Alfred Gilbert (the special subjects of each lecture are not stated), two by Dr. Waldstein on Greek sculpture; and four by Professor Aitchison on Vitruvius. We confess that we should have thought enough had been said of late years about Vitruvius, and that lectures dealing with and illustrating the art of architecture from a modern standpoint, as Mr. Clausen's lectures dealt with painting, would have been of more value to the Academy students.

MYSTERY AS AN ARCHITECTURAL QUALITY.*

THE love of mystery is akin to the love of knowledge. It is a universal instinct of mankind. It was not the aboriginal savage, but the scientific Egyptian, who devised a plan for his temples of which mystery is the very keynote; and even the rationalistic Greek must have his Eleusis wherewith to feed this universal craving.

Without being careful to define the term logically it may be useful to distinguish the two senses in which the word is used. (1) Mystery absolute: something which we may apprehend, but not comprehend, that which transcends the powers of thought, and about which speculation is either superfluous or mischievous. This is the theological sense. (2) Mystery relative, i.e., to man's knowledge, or condition of growth at any given period of time, as, e.g., the phenomena of light and sound may be said to be mysterious to the blind and deaf. It is under this latter head that mystery as an æsthetic quality falls. We may describe it, then, as that which is obscure until it is explained, not as a puzzle without a solution. In this sense mystery is opposed to obviousness, or, if I may be allowed the word, to blatancy—never, I think, to simplicity or lucidity, the true contrary to which is mystification or confusion.

"To many temperaments," wrote a reviewer in the *Quarterly*, "it is extremely disagreeable to be kept in the trammels of mystery." But, as Arnold Toynbee pointed out, "it is vain to chafe at mystery—it is as appropriate to consciousness as clearness to the intellect. We are very near the fount of all things when we feel that there is mystery." We cannot escape it, and for the following reason:—

"Poetry," says Matthew Arnold (in words that may well apply to art generally), "is nothing less than the most perfect speech of man, that in which he comes nearest to being able to utter the truth."

Art has to deal with *phenomena*, which are "but shadows and likenesses of the absolute truth that reveals itself to men in different ways, but always imperfectly, and as in a glass." Hence the sense of vagueness that one so often feels in poetry, a vagueness that is partly subjective, due, i.e., to the reader's lack of imaginative grasp, and partly inseparable from the poet's work; for, after all, human speech is a clumsy instrument for recording and conveying thought, and words are but an index or signpost to the poet's meaning. It is this blurred vision, this approximation to the absolute truth, that makes the greatest art mysterious. Nature herself is full of mystery: the complexity of forests, the monotony of deserts, the height and depth of mountains and ravines, darkness and silence, sleep and death—all are mysterious. The value of this quality in the arts generally arises, then, from its correspondence with the same quality in the natural and spiritual worlds, whence art draws her subject-matter; in other words, from its truth to nature.

Its function is to arouse the imagination of the beholder. It is, indeed, as a challenge to imagination that it makes its presence felt to most of us; and to those in whom the imaginative faculty is well developed does this quality most of all appeal.

The slightest means suffice to set the active imagination at work, e.g., a very superficial analysis shows Hood's powerful and fantastic

* A paper read before the Edinburgh Architectural Association on Wednesday, Nov. 23, by Mr. F. C. Eden.

poem, "The Haunted House," to have been suggested in the first instance solely by "those boards obscurely spotted," which, to the poet's eye, tinge with their own lurid colours all the ordinary incidents of decay and ruin, and give a sinister import even to the vanished midge and deserted cobweb.

Not only in poetry, but in the higher romance and drama, does the mysterious play a conspicuous and recognised part. The painter also must be, to use Ruskin's phrase, "truthfully various and obscure." The sculptor's appeal is more obvious than that of the painter. "I would not like," said Thackeray, speaking of Michael Angelo's great work—"I would not like to be left alone in a room with the Moses." The same sense of vague uneasiness, as in the presence of some unseen, but felt, spiritual intelligence, produced by another work of the same master, is well conveyed by the lines in which Rogers describes the Duke Lorenzino in the New Sacristy at Florence. "It fascinates, and is intolerable." But it is, I think, to music, and architecture, as being entirely creative and not imitative arts, that mystery is especially appropriate. In the former it reaches perhaps its highest expression in Beethoven's Symphonies; and as to the latter, if the imperfection of language as a medium for transmitting thought be a necessary source of mystery in poetry, what are we to say of stone, wood, and clay in which the architect must find his inarticulate utterance?

We have seen that if art is to be true to the rock whence she was hewn, she must share the quality of mystery with nature herself. Nevertheless, I would guard against being supposed to claim too much, too large a sphere, or too great importance for its influence in æsthetics. It is, after all, but one of these countless qualities which combine to make up the perfect work of art. This much, I think, may be claimed for it, that though we cannot say that mystery is essential to true beauty, yet in the very noblest examples it is ever present. In the words of Bacon, "There is no exquisite beauty but hath some strangeness in the proportion." It is, in fact, the finishing stroke that puts us in touch with the infinite. "No work of any art," writes Ruskin, "in which this expression of infinity is possible, can be perfect, or supremely elevated, without it, and, in proportion to its presence it will exalt and render impressive even the most tame and trivial themes."

In attempting to enumerate and in some sort classify certain sources of mystery in architecture, I am aware that there is danger of treading on forbidden ground. As in all æsthetic analysis, there is this risk: that "we murder to dissect." For mystery itself is intangible, ethereal, elusive. It is overheard, rather than heard; felt, rather than seen. Insight, not sight, is needed, since

We are led to believe a lie
When we see with, not through, the eye.*

But we have to do not so much with the abstract quality, as with the concrete forms and forces that seem to us, if not to combine to produce it, at least to enshrine and clothe it, and through which the perception must penetrate to reach the spiritual essence within.

I have placed first that which seems to me the most fruitful source of the mysterious element, viz., *Reserve and Suggestion*. These are, to a great extent, correlative, i.e., the mind of the designer imposes the restraint, the imagination of the beholder responds with the suggestion. No doubt the designer suggests also, but it is chiefly by silence that he does so. It is this reserve which modern architecture for the most part lacks. It puts, as the phrase goes, all its goods in the shop window. One glance and we have seen into the heart of it. We have no longings, no supplings, no musings over it. It does not kindle dreams, nor is it touched with visionary impulses. There can be no tender, pathetic strain where all is loud and definite—very note accentuated with beat of drum.

Complication, that is, complexity of plan, may, I think, be rightly considered under the heading of reserve, because it is by this very complexity that the designer causes his meaning to be grasped bit by bit. He does not intend that we shall understand him too easily.

And so in churches—and I am thinking chiefly of religious buildings—four or six aisles are more mysterious than two. It is the mystery of the maze or forest—not very subtle,

* Blake.

perhaps, but undoubtedly effective. Again, a frequent device of the Middle Ages, viz., deflecting the axis of the chancel from that of the nave (which is, by the way, a purely æsthetic device, not a symbolic one), was used with the same object; and so also the apse with its radiating chapels, or any plan which constantly brings fresh perspectives into view as the point of sight is changed. In illustration, the plans of Canterbury, Cordova, Oxford, and Burgos may be alluded to; also crypts generally, and that wonderful group of buildings known as S. Stefano, at Bologna, where we find seven complete churches, differing in level, size, plan, and age, under one roof.

In connexion with complexity of plan may be mentioned *Complexity of Grouping*, and of this the Piazza Maggiore at Bergamo, described by Street, is a striking example:—

"The very position of the Broletto," he writes, "teaches us a lesson, forming on one side the boundary of the piazza, on the other its faces, within a few only, the church of S. Maria Maggiore, and abut at one end on the west front of the Duomo; and to this singularly close, even huddled grouping, much of the exquisite beauty of the whole is owing. No doubt, S. Maria and the original cathedral were built first, and then the architect of the Broletto, not fearing—as we would fear now—to damage what has been done before, boldly threw his work across in front of them; but upon lofty open arches, through which glimpses just obtained of the beauties in stone beyond make the gaze even more delighted with the churches when he reaches them than he would have had if all been seen from the first. It is, in fact, a notable example of the difference between ancient grouping and modern, and one instance out of hundreds that might be adduced from our own country and from the Continent of the principle upon which old architects worked, and yet people, ignorant of real principles in art, talk as though somewhat would be gained if we could pull down St. Margaret's in order to let Westminster Abbey be seen; whereas, in truth, then, certain result would be the loss of that kind of intricacy and mystery which is one of the chief evidences of the Gothic spirit." (*Brick and Marble*, etc.)

Slightly differing from the last is *Sub-division of a Simple Plan*. This, again, is an illustration of the principle that the eye must not be allowed to comprehend all at once. This is the chief æsthetic function of screens. Not long ago the vicar of a large town church was discussing the desirableness of a chancel screen to which he was himself opposed; and to justify his opposition, he pointed out, as an insuperable objection to a high screen, that, from a certain carefully selected position in the nave, the cornice would appear to cut the screen in two, or perhaps it was the east window, but it matters not. Nor did the obvious reply, that there was only one particular spot in the church where this deplorable optical effect would be produced, tend to modify his conviction. It is easy enough to demonstrate the irrelevancy of such a contention, for it is all a question of the position of the eye, and that, happily, is not fixed. This little incident is typical of a constantly recurring objection—people forget that it is the very object of a screen to obstruct, baffle, and perplex the sight. Art, no less than the religion she serves, has her "discipline of the secret" and her "economy" of truth. True art never deceives, but reserves her secrets for the right persons and the right times.

It was stated by no less an authority than the late Archbishop of Canterbury that a huge unobstructed parallelogram, such as Westminster Hall, was the ideal plan for a modern church. Well, there are, and have been for centuries, two types of church plan: one northern, Gothic and mysterious; the other southern, Italian and apocuous—the one based on reverence, the other on sacrifice. It is useless to discuss the merits of the rival systems, since each has produced, and may produce, such magnificent results; but there can be no question as to which of the two is indigenous to the soil of these islands. In any case, such a line of thought as that of the vicar above-mentioned, who added, truly enough, that mystery was opposed to the spirit of the age, showed a complete misconception of the fundamental idea upon which the former type, that familiar to us nevertheless, is based. It is a misconception that has been risen among restorers, from Wyatt the Destroyer down to the present time. Cathedral churches especially have suffered from the fallacy of the vista, or unimpeded view from end to end of every part, to which have been sacrificed so many solid structural and central organs. On the contrary, as mediæval architects were well aware, the more a church is divided and subdivided with walls, screens, grates, and veils, the better it becomes both devotionally and æsthetically—æsthetically, because its apparent size is increased; the eye is thwarted and curiosity stimulated; there is a feeling of expectancy,

a sense of power in reserve; a suggestion of infinity. Such a church becomes in a word mysterious. Nor is the mystery that comes from such subdivision any bar to devotion. "I should like to lay it down as a principle," said a great philosopher, "indeed, it is a principle, that no place can be devotional but what is small." "When thou prayest enter into thy closet." Of the great altar screens, such as we find at Winchester and St. Albans, Walcott, the antiquary, finely writes: "Whilst they obstruct the view of the eastern limits of the church, which hitherto augmented the sublimity of the sanctuary, they resemble a gorgeous veil before some further Holy of Holies, which our earthly services faintly shadow."

The last sub-heading under reserve is *Incompleteness*. This may be actual, as in many old buildings, or merely suggested for purposes of his own by the designer. There is a type of west front not uncommon abroad, where a beginning is made of two towers, one only of which is finished, as at Strasburg and elsewhere. The fancy is then better pleased to picture the completed design than it would be by seeing it actually realised; and I think few of us would wish to see a second tower added to Antwerp. And doubtless this is one of the reasons why the old fragmentary Cologne Cathedral was far more sublime—as those who have seen both tell us—than the completed building.

The rhetorical figure called *Apoteosis*, by which the speaker leaves a sentence unfinished for the audience to supply the conclusion, has its analogy in architecture. The design starts a train of thought, and then breaks off suddenly. I have noticed the employment of this device in the late J. D. Sedding's works. I recollect a design for a tower—never, I think, carried out—which became suddenly rich in the belfry stage, and then, before the design was worked to a logical conclusion, it was impatiently cut off by the heavy projecting eaves of the roof, leaving the spectator free to complete the suggested thought as he chose.

The *Unexpected* may be claimed as a legitimate source of mystery, though chiefly concerned with detail and furniture. We are startled by points of interest in unexpected places, or by coming perhaps upon realistic sculpture in out-of-the-way chapels and nooks, Calvaries and sepulchres of life-sized figures and the like. But though these may, nay, should be, fearful and severe, there must be nothing to excite disgust, as does so much of modern religious sculpture on the Continent. I am no advocate for mystery of the skull-and-cross-bones type.

But experience shows that this method of exciting the imagination by surprise is easily abused, and there is no fear that the self-respecting architect will fall into the cheap, stagey trickery with which one is only too familiar abroad—concealed and reflected lights, false painted perspectives, and devices in luminous paint (as I have seen in a crypt at Boulogne). Such unworthy methods are soon detected and merely excite contempt.

A word as to gloom. I am inclined to doubt whether it be a true source of mystery, except in combination with other attributes. I know many modern churches which are gloomy enough in all conscience without being in the least mysterious.

Gloom to have real value must be relative, not absolute; relative, that is, to the light outside. We can appreciate gloomy churches in Spain, but not here. In the south their cool interiors are a relief from the relentless glare of the sun; here for three hundred days in most years they would merely repel. The effects of gloom are:—

1. It increases the apparent size of a building; and this, not by equally diffused gloom, but by unequal lighting.

2. To the parts remote from the eye it gives the effect of gradual melting into nothingness, or infinity.

3. Part being lost to sight, the imagination is called upon to supply the deficiency. Crypts and catacombs derive much of their impressiveness from this source, but also from their complexity, association with the dead, and so forth.

Under this heading I may be permitted to suggest the question whether the artificial lighting of churches has been adequately approached from this point of view. Much time and ingenuity have been expended on the design of gas and electric lights fittings—far too much to my thinking—too little for the arrangement and disposition, quality and

quantity, of the light itself, and it is thought that enough has been conceded to art when the ironmongery has been architecturally treated. But surely church lighting, considered quite apart from fittings, has extraordinary capabilities for artistic treatment, though the garish aspect of many churches when the gas is lit gives but small promise of any such possibility.

Its special function in this respect lies in developing certain qualities of the building, chiefly mystery; and here not so much by what it does as by what it leaves undone—that is, by judicious disposition of shadow. Nothing is commoner in a town church when lit up at night than an entire absence of shade or shadow. Light, however, when equally diffused throughout an interior—and this is the ideal aimed at in most schemes for lighting—makes accentuation, essential as it is to artistic success, impossible. The great evil from which we now suffer is over-lighting, originating partly from ignoring the real purpose for which light is wanted, and partly from the fatal facility with which gas and electric light lend themselves to abuse in this respect. Nobody ever saw a church overlit with candles. Artificial light is wanted in a church in order that the ceremonies may be reverently performed, that people may come and go with ease and security against panic, and that those who wish to do so may be enabled to read their books. Hence, if the light is put where it is wanted for these purposes and there only, i.e., near the floor and not up in the roof, and shaded so as not to tease the eye, we have gone a long way in the direction of a rational method of lighting, and one that will help, not mar, the expression of the architecture.

Next, any highly *imaginative design* possesses an element of mystery, and this, I think, for the reason that all design of the highest order has something of inspiration. It comes from without. The more spontaneous and inevitable the design appears, the more we wonder at it.

Men *size* possesses no charm on this side of the Atlantic; nor is it in the least mysterious, except so far as it can suggest infinity. "The vastest bulk is no nearer infinity than the most minute, if it be definite bulk."* The Middle Ages builders, especially in Italy, employed many methods for baffling the eye and, as far as possible, preventing it from gauging the exact size of buildings. For instance, they would gradually diminish the arch openings of the arcade eastwards, as in the Duomo of Fiesole. They would also lower the capitals progressively, at the same time sloping the floor upwards or raising it by a step in the middle, as at Sta. Maria Novella. Sometimes they would gather in the walls eastwards, as at S. Stefano, Venice, where the church actually approaches one another to the extent of 16 ft. The result of these devices, and many others of the same kind, is not necessarily to increase the apparent size of the building—it is, indeed, obvious that they might have the opposite effect—but to destroy the sense of definite size, and to suggest infinity also by gradation and progression. Certain forms impress the mind with spiritual ideas, e.g., roundness expresses finality and completeness; curves and gradation suggest infinity. These forms, in conjunction with great size, are the cause of the majesty and power of the dome. "Under the dome of St. Paul's," says a modern writer, "we are awed by this feeling of vastness of space—it is the infinite made finite."[†]

I think it not improbable that St. Mark's, the lower church at Assisi, and many of the Byzantine churches owe much of their mysterious impressiveness to the extreme richness of their materials and decoration. But it is chiefly in small objects that abundance and intricacy of detail produce a kind of mystery—from the runic monsters of Scandinavia, "in-veterately convolved," to the sumptuous looms of Genoa and Bruges. Even a pattern may be mysterious.

With many an old building *situation* is a more potent factor in rousing the imagination and the sense of expectancy than any conscious effort of the architect. But if his building match its situation nature will second his endeavour. When the mediæval workers had to build upon a rock they rooted their masonry as it were in the crevices of the rock, so that the building seems to grow out of and form part of nature's architecture. Nowadays we

* Ruskin.

† A. Toynbee.

seldom build upon a crag if we can help it, but when obliged to do so we blast the top to make a comfortable platform on which to set a snug building that would be equally suitable upon a level plain. So all mystery of situation is lost. Still, in dealing with the outlying parts of a building, the enclosures, and approaches, it must be the architect's endeavour, when he would make his building mysterious, to bring about a state of mind in which such impressions are most readily received. "So the spectator," says Ruskin, "is brought to your work already in an excited and imaginative mood. He has been impressed by the cathedral wall as it loomed over the low streets before he looks up to the carving of its porch, and his love of mystery has been touched by the silence and the shadows of the cloister before he can set himself to decipher the bosses of its vaulting. . . ." You must meet this imaginative temper half way; you must "touch the sense of terror, or satisfy the expectation of things strange, which have been prompted by the mystery or the majesty of the surrounding scene. And thus your leaving forms more or less undefined, or carrying out your fancies, however extravagant, in grotesqueness of shadow or shape, will be for the most part in accordance with the temper of the observer; and he is likely, therefore, much more willingly to use his fancy to help your meaning than his judgment to detect your faults."

Remote age, I have placed last, because the mystery in perhaps the majority of cases arises more from association than from any intrinsic property of the architecture itself. This, together with their incompleteness, is the mystery of ruins. The mediæval life of castle and cloister is a thing outside our experience, and in the distance appears surrounded with a halo of romance; and so buildings which to contemporaries were perhaps commonplace will be endowed by Time with properties both new and strange.

But, after all, mystery refuses to be docketed and pigeon-holed, and I would not be understood to imply that the qualities of reserve, gloom, etc., just enumerated are other than secondary and contributory causes in its production. It is easy to say that the undercroft at Canterbury is mysterious because it is dark and complicated; but what of a badly planned basement, which may combine these attributes in a superior degree? Is that mysterious also, and if not, why not? And if the thickly-planted columns of a crypt increase its mystery,

would the same effect be produced by a forest of steel stanchions; and will a glazed-brick corridor, however narrow, dark, and tortuous, be as mysterious as the straightest alley in the catacombs?

In conclusion, I would submit that mystery is the resultant of many converging forces, some of which cannot easily be traced to their starting point; and is of so subtle an essence that it is liable to be dispelled by the slightest breath of the commonplace and the vulgar. F. C. E.

SPRING-GARDENS, CHARING CROSS, AND WHITEHALL: 1801-1900.

Spring-gardens.—The lettering "Mr. Penn's garden" (10, New-street) on T. Chawner's Survey of 1804 (Fig. 1) explains in a measure an announcement in the *Times* of February 26, 1802:—

"Lord Malmesbury and Mr. Penn have obtained a grant of the Crown of so much of the ground as lies within the angle of the wall at Spring-gardens. The wall is to be straightened and the space within will give Mr. Penn an agreeable area before his windows, and add to his Lordship's garden. The work is already in hand."

Having obtained a grant from the Crown to build over the Wilderness in Outer Spring-garden in 1772, Frederick, fifth Earl of Berkeley, built a house (B, Fig. 3) which in part stood over the north entrance of the long narrow passage, plotted in a plan of 1690, leading into the old Spring-garden and Milk Fair in St. James's Park. Porter's sketch and plan, 1824, prove that next west to Berkeley House, and on the site of the French Huguenot Chapel (A), stood Wigley's auction mart, with its "Great Room" on the first floor, being, it appears, the "Great Concert Room in Spring Garden," in which Leopold Mozart and his two children gave their first concert in London on June 5, 1764. James Cox, a clockmaker of Shoe-lane, rented the Great Room for his museum, dispersed by lottery in May, 1775. The Huguenot Chapel, founded temp. William III., was replaced with the later St. Matthew's chapel-of-ease to the parish church, which until last autumn stood at the north-east corner of New-street. In 1858 the late Metropolitan Board of Works bought Berkeley House from Lord Fitzhardinge's executors for 500*l.*, and having taken a new lease of the site, removed in 1860 from No. 1, Greek-street, Soho, to the new offices built by F. Marrable, first Superintendent of Metropolitan Buildings

and Architect to the Board. To Marrable succeeded in 1861 G. J. Vulliamy (ob. 1886), who raised the building by one story and made extensive additions at the rear. In 1876 the Board acquired the leasehold interests of the adjoining Nos. 10, 12, and 14. D. Burton had built No. 14 in 1827 for himself; his dining-room, the "Grecian Parlour," on the third floor, is commonly confused with Wigley's Great Room, which was burned, with the two adjoining houses, on April 2, 1785. Mr. Thomas Blashill enlarged the Board-room for the London County Council in 1889, by building a semi-circular wall and a public gallery on the north side, and rearranged the floor space for 137 councillors. Amongst the many houses since taken by the Council are Nos. 26-7, Cockspur-street, built by Mr. T. Barnes-Williams [January 12, 1889]* for the firm of E. Stanford on the site of the British Coffee House; the destruction of that unique example of Robert Adam's work is much to be regretted. The demolition in Spring-gardens and New-street (Figs. 3 and 4) has continued during eighteen years past. It was begun in the spring of 1886 with the pulling down of the terrace and the Gun-house in the Park. New-street and the terrace are plotted in a plan of 1726; the retaining wall at the end of the street and along the terrace was a piece about 228 ft. long of the old Park wall delineated in Aggas's map. In 1804 Chawner pulled down part (A-B, Fig. 1) of the wall, took a small parcel of the Park for the rounded sweep (C) at the end of New-street, and made the steps and footpath (E and D) descending into the Park. Many of the New-street houses were occupied by the Admiralty, and were handsomely fitted with joinery, and carved work in wood and marble.

Charing Cross.—For postal purposes Charing Cross extends from Northumberland-avenue to Great Scotland-yard (Nos. 1-34), and from Buckingham-court to Cockspur-street (Nos. 38-66). Nearly all of the houses were rebuilt during the century; some have been pulled down since. Messrs. Cox & Co., army agents, removed in November, 1888, from Nos. 1 & 2, Craig's-court, to No. 14, designed for them by Ewan Christian (ob. 1895); No. 43, Messrs. Cocks, Biddulph, & Co.'s, is by Richard Coad. In 1900 Mr. J. Oldrid Scott built the Spring-gardens front of the bank, on the site of No. 31, formerly No. 20, a house well known to architects.

* Dates within square brackets relate to illustrations in the *Builder*.



Fig. 1. Spring Gardens, etc.: a Survey by T. Chawner, 1804.


A to B—Old Park wall taken down.
C—Part taken into the street from the Park.

D—New public passage into the Park.
E—Way under this landing.

F

for it was his father's home in 1838-44, and subsequently his offices. No. 49, Messrs. Drummond's bank (June 28, 1879), was rebuilt in 1879 by Philip C. Hardwick (ob. 1892) on the former site of the Bull's Head and Adam and Edward Lockett's taverns; and, we gather, of the house into which Andrew Drummond (ob. 1769), the founder of the bank, migrated from his first counting-house, since absorbed in Cox & Co.'s, Craig's-court. In excavating the ground were found an unusual amount of the fossilised remains of extinct mammalia—the cave lion, mammoth, Irish elk, etc., and in the upper deposits the Celtic ox, horse, and sheep. As elsewhere in that quarter the soil presented great difficulties, and the foundations were carried to a depth exceeding 30 ft. On March 22, 1879, we described and illustrated the works, with the use of the pulisometer, the water being heavily charged with sand. The Phoenix Fire and Police Life Offices, 1804-5, are by Joseph Michael Candy (ob. 1843); the Union of London and Smiths Bank [April 20, 1872], by F. W. Porter (ob. 1901), stands on the site of Nos. 66-7, Farrance's noted confectionery and ice shop. In the winter of 1855-6 Sir G. G. Scott repaired the pedestal of King Charles I.'s statue. He found that fractures in the black marble slab had been pieced with Portland stone, and that the fastenings of three feet of the horse had become insecure by reason of the strain due to the attitude of the horse. Scott inserted a copper chain around the stones of the cornice below a new and thicker slab of granite, securing the latter to the pedestal, and the horse's feet to the slab, with copper bolts. The carving of the pedestal, 1674, by Joshua Marshall, is attributed also, 1680, to Gibbons: the railings have been removed.

(New Admiralty.—In his report of August, 1835, upon the Admiralty (by Ripley, 1724-6), Sir James Pennethorne says it rests altogether upon a timber platform or raft laid over a bed of river deposit 6 ft. or 7 ft. thick, which is soft and full of water, and that in consequence it had settled more or less in every part. The site, in fact, is that of the shallow lake, once part of the Thames lagoon, since fed by an affluent of the Ay brook, or Tyburn, and by the tidal estuary of the Merleth, which, it is said, Dunstan and his engineer-monks embanked and drained. The Admiralty extensions which are now being completed with Block III. (Figs. 3 and 4) are the outcome of the proceedings of a Select Committee appointed in April, 1887. Five years before, a Committee had recommended a larger scheme for new Admiralty and War Offices, involving the demolition of the (old) Admiralty and the Paymaster-General's Office, and the site was obtained for 500,000*l.*, whereas only 150,000*l.* passed to private owners, the remainder being for Crown property [July 8, 1882, official plan]. Nine architects were nominated to compete in 1884; P. C. Hardwick, Ewan Christian, and three Government officials adjudged that the best sets submitted were, in the order named, those by Messrs. Leeming & Leeming, A. Webb & E. I. Bell, and Verity & Hunt (September 6, 13, and 27; and October 4, 1884). Messrs. Leeming & Leeming's designs were accepted, and as modified by them are illustrated by two drawings in our number of April 4, 1885; the clearance of the site, on the north-west, was begun in February, 1886. The project did not receive general approbation. The Council of the Institute, who, in June, 1882, had addressed a letter to Mr. Shaw-Lefevre, First Commissioner, framed a memorial, and on March 1, 1886, the Earl of Morley received a deputation of the members, who submitted a block plan [March 6, 1886] for using the site with greater advantage. The chief points urged in the memorial related to a redistribution of the "open area" spaces, the setting back of the street frontage without dislodging Messrs. Drummond's bank, and the opening out of the Mall to a width of 100 ft. into Charing Cross. The Government re-considered the whole matter, and their Select Committee of April, 1887, recommended an abandonment of the scheme in favour of extending the Admiralty, and of erecting a separate War Office. The supplementary estimates of August, 1887, included a sum of 8,000*l.* to be paid to Messrs. Leeming & Leeming, "in full satisfaction of their claim . . . in connexion with the preparation of plans for the erection of new offices for the Admiralty and War Departments," and they were then instructed to proceed with the Admiralty extension. The additional buildings were designed by them

at first as -shaped on plan, with a colonnaded screen (since replaced with Block III.) on the south side. Mr. William Webster, contractor for the foundations, began the work in January, 1891, excavating to a depth of 17 ft. over an area 324 ft. by 134 ft. Finding the loose gravel sub-soil above the clay heavily charged with water, he lined the cavity with thick concrete walls and a floor, and covered the faces of the retaining walls with Claridge's asphalt. Block I., completed in July, 1895, cost 190,000*l.*; Block II., into which the Accountant-General's branch moved on August 14, 1900, cost 160,000*l.*; for Block III. 150,000*l.* were voted in 1899. Messrs. J. Chessum & Sons constructed the foundations; the superstructure by Messrs. Holloway Bros. supplants the gallery or covered way, which would have formed a pleasing and unwonted feature of the quadrangle as seen from the parade-ground. It is stated that another block is contemplated, to front Whitehall, and taking in the site of the Paymaster-General's office.

(New War Office.—For the block now being erected by Messrs. Foster & Dicksee on the east side of Whitehall, the designs [March 25, 1899, with ground floor and block plans] were made by William Young, who was chosen in July, 1898, out of a list of eight nominated by the Institute. Mr. Young, unhappily, died in November, 1900; the carrying out of his designs has been entrusted to his son and partner, Mr. F. Clyde Young, in association with Sir John Taylor, Consulting Architect and Surveyor for New Public Offices, for the interior arrangements. The site (Figs. 3 and 4) covers about 3½ acres; Messrs. Foster & Dicksee contracted for 447,000*l.*, and to complete the structure by June 26, 1906. On June 20, 1885, we published a perspective view, especially made for our journal, of Mr. H. B. Garling's submitted designs for the two offices, as they would have appeared on the Park side, and on September 9, 1899, his design for the War Office, adapted to the lines of the official plan: see Foreign Office group, *infra*.

Northumberland-avenue.—The last of the river-side mansions between Whitefriars and Whitehall, and the home of the Howards, the Percys, and the Seymours, was sold by their inheritor, the Duke of Northumberland, to the Board of Works for 500,000*l.*, in June, 1874. Their Charing Cross and Victoria-embankment Approach Act, 1873 (36-7 Vict. c. 100), empowered them to make a new street to the Embankment they had completed three years previously. Henry Howard, Earl of Northampton, built the house in or about 1605; Algernon Percy, tenth earl of Northumberland, rebuilt the southern front and the stone stairs after a design, 1642, ascribed to Inigo Jones. It was the Suffolk House, drawn by Hollar, and the "house with stairs" whence set forth

the wedding, sung by Suckling, of Lord Broghill and Margaret, daughter of Theophilus Howard, second Earl of Suffolk. The precise period of the later changes is fixed by two letters written in 1749-50 by Frances, Duchess of Somerset, and communicated to this journal (April 15, 1871) by Wyatt Papworth, which describe all the works, and evince her capabilities in no common degree:—

"I am attending to all my Lord's designs there. . . . Mr. Lord will do a good deal to the front of the house in order to make it appear less like a prison; he builds a new wing on the right-hand side of the garden . . . the staircase is very noble . . . private and state rooms, new garden, stables, etc., described."

The court-yard, of plain Italian character, measured 81 ft. square; the street front, of brick, 162 ft. long (1605) is generally attributed to Bernard Jansen, though he may have been only the builder, the later stone frontal to Gerard Christmas. Papworth cites a fine fo: print of the front, dated February 24, 1762, and lettered "Daniel Garrett, art. J. June, that time. Below the lion were the initial letters of the Duke's name and titles in Latin—"A L G: D: S: 1749 C: N: Res:." and "A S: "P N" intertwined. In 1765 Robert Mylne added a pavilion and two wings on the south side; Robert Adam built the great drawing-room in 1774. The picture-gallery and the state staircase formed the chief features of the interior. On the demolition in the autumn of 1874 the lion (its head to the west), modelled in lead by Carter in 1752, was taken to Sion House, Isleworth, and the marble stairs to the late F. R. Leyland's house, No. 49, Prince's-gate, S.W. The avenue, made by J. Mowlem & Co., and opened in March, 1876, is the only road laid out by the Board of Works at a profit, due mainly to the absence of trade interests, and to the eager speculation in the sites; the surplus amounted to 119,819*l.* over a gross outlay of 711,491*l.* The Victoria, until June, 1887, the Northumberland-avenue Hotel [May 1 and November 6 (main entrance porch, carving by Mr. J. Beekbinder), 1886] is by Messrs. Isaacs & Florence, who, to reach a solid foundation for the principal walls, excavated to a depth of 50 ft., and even then were compelled to use a 10-h.-p. engine with pump night and day six or seven months, whilst a 6 ft. concrete bed was laid over the entire area of 32,000 ft. For the Constitutional Club, opened on October 4, 1886, Colonel R. W. Edis adopted terra-cotta and glazed faience by Mr. J. C. Edwards, for the elevations. He designed all the fittings, and under his directions Mr. Frampton, R.A., modelled most of the outer detailed ornament. Mr. Boyce was the general contractor; the wrought-iron work is by Messrs. Starkie Gardner & Co. The main walls stand upon brick legs or piers on continuous footings at a depth of 40-50 ft., with hoop-iron bond iron between their courses. The Royal Colonial Institute [November 6, 1886, with three plans] is by Messrs. W. G. Habershon & Fawcner. On November 3, 1879, the Society for Promoting Christian Knowledge moved from Newcastle (or Powis) House, Lincoln's-inn-fields, to the building [October 18, 1879] designed by John Gibson (ob. 1892), having bought the freehold for 40,500*l.* Messrs. Kirk & Randall erected the Royal Avenue Theatre in 1881-2, after F. Fowler's plans and designs, using corrugit and bottom-bed from the Cornsham Down quarries for the stone-work. The Board of Works had at the outset required that all the buildings in the avenue should be fronted with Portland stone. The interior of the block at the corner of the avenue and Charing Cross [F. & H. Francis, April 21, 1888] was re-arranged by Mr. F. W. Waller for temporary uses of the National Liberal Club, founded in 1882.

Scotland-yard (Base-court) and Whitehall-place.—Middle and Little Scotland-yards have disappeared. On the formation of the force in 1829 the headquarters of the Metropolitan



Drawn & etched by J. T. Smith.

Guard Room Scotland Yard.



Fig. 3. General Plan: first half of XIXth Century.

A—Site of French Chapel.
B—Berkeley House.
C—Marshalsea Court House.
D—Metropolitan Police, A Division: 1829-90.
E—Queen's Treasury } Palace Beer
F—Almonry Office } Buttery.
F—Fife House, pulled down in 1899.

G—Little Fife House.
H—Fore-shore reclaimed by Lord Fife.
I—Confectionary: 7, Whitehall-yard.
J—Old Exchequer: 3, Whitehall-yard.
K—Cromwell House (Palace Wine-Cellar).
L—Malmesbury House.
M—Pembroke, or Harrington, House.

N—Boat-house.
N—Board of Trade (Earl of Rochester's).
O—Lord Loudoun's.
P—Duke of Richmond's.
Q—Ordnance and Transport: Board of Control: Civil Service Commissioners (now the Police-station).

R—Dover House Stables (now R.U. Service Institution).
S—"The Old Tennis Court."
T—Long's (Charles II's) Tennis Court.
a—Whitehall Stairs.
b—Privy Stairs.
c—Garden Stairs.
d—Manchester Stairs.

Police were established in Great (or Old) Scotland-yard, where until their removal in 1890 to New Scotland-yard, Canon-row, they occupied the detached block and the present Reformatory and Industrial School Inspection Office (D, C, Figs. 3 and 4). The latter building had been the Palace Court, transferred thither from Southwark in 1801. The Court, constituted in 1664 and abolished on December 31, 1849, was served by judges and officers of the ancient Marshalsea Court of the Queen's House, being one of record for actions of debt, damage, trespass, etc., arising within twelve miles—the City excepted—around the sovereign's Palace of Whitehall. The "verge of Court" extended from the corner of Downing-street to the river-side at the end of Northumberland-street, Strand, and in the yards debtors found sanctuary under protection of the Board of Green Cloth. T. Chawner rebuilt the entrance from Whitehall in 1824, carrying the archway up another floor; his coloured drawings of the old and new archways are in the Grace Collection. Chawner's signed plan of August, 1821, is lettered "the newly-erected houses in Whitehall-place," built on Crown leases of ninety-nine years, as a cul-de-sac with a garden, of which the rounded wall abutted on Dalgleish & Taylor's coal-wharf by Scotland Dock. The Charing Cross railway bridge obstructs what was one of the finest views in London, with St. Paul's in the distance as seen due east across the low wall. The Woods and Forests Office, and the adjoining

house, at one time the Dutch Ambassador's, at the north-west corner, are by William, brother of Robert and James Adam (ob. 1822). The east end was opened out into Victoria-embankment, (1864-70). Nos. 12-22 have since been pulled down (1899) for the new War Office, the Office of Works removing from Nos. 12-4 to Storey's-gate.

Whitehall-court and Horse Guards and Whitehall avenues.—The Whitehall Court Company's plan (December 5, 1885) closely follows the course recommended in the Thames Embankment Commissioners' Report of 1861; to that circumstance was due, it appears, the co-operation of the Treasury and the Woods and Forests in their undertaking, which involved the demolition of Nos. 8 (Lord Carrington's), 4, 5, and 6, Whitehall-yard. King Edward VII. (then Prince of Wales) opened the two avenues on June 6, 1893. Whitehall Court [January 2, 1886, Archer & Green] contains suites of 7-20 rooms in six blocks, and constructional woodwork was entirely eschewed. Our drawing shows the National Liberal Club, of which Mr. A. Waterhouse, R.A., made some modifications to complete the east façade. The club-house [May 9, 1885, with upper-floor plan] covers 23,750 ft. superficial; a noteworthy feature is the angle-tower which, whilst severely plain in the lower stories increases in richness and intricacy as it detaches itself from the gables on either side.

Dover House.—James Paine built Dover House on the site of the Duke of Ormond's lodgings

(Figs. 2 and 3) in 1754-8 for Sir Matthew Featherstonehaugh, who died in 1784. Ten years afterwards his son, Sir Henry, or, by another account, Sir Jeffrey Amherst (Lord Amherst) vacated the house in favour of the Duke of York and Albany, for whom Holland added the Ionic portico, domed vestibule, and grand staircase. In 1791 the Duke exchanged York House to Lord Melbourne for the house of the latter—now the Albany—in Piccadilly. The name of Melbourne House occurs in the Blue Book, 1831; the next year occurs the name of Dover House, the lease having passed to G. J. Welbore Agar-Ellis, only son of Viscount Clifden, and first Baron Dover, whose son, Lord Clifden, and the son's widow lived there until 1885. Dover House then became the Scottish Office; a wing was added in 1899 on the south-west. The portico is opposite the site of the King's, or "Holbein's" Gate, pulled down in June, 1750.

"The Court" and Whitehall-yard.—The outline of present buildings plotted on our reproduction of Fisher's plan (Fig. 2) is made exclusively for the Builder from a large-scale survey of the Crown property drawn, and signed on April 11, 1881, by the late Arthur Cates, Surveyor of Crown Lands, etc., and with the valuable assistance of Mr. Walter L. Spiers. Surveys and views of the XVIIth century demonstrate that the fire on January 4-5, 1698, consumed less of the Palace than is commonly supposed. The Court did not return to Whitehall; the Crown leased the vacant sites for

short terms for houses whereof many have in their turn disappeared. Portions of Wolsey's York Place and its successor survived, indeed, to our own day. In the stone-built basement of Cromwell House (K, Fig. 3) (Board of Trade) may be seen four bays, in two aisles, of a Tudor Gothic vaulted crypt; the site is that of the "Wine Cellar" of Fisher's plan. Sydney Smirke's description and measured drawings, January 23, 1832, are in *Archæologia*, Vol. XXV. He ascertained that the floor was 5 ft. 4 in. above the old level. His remark that "it is even now scarcely out of the reach of spring tides," reminds us of the inundations from the Thames and of Lord Dorset's lines:—

"The King, with wonder and surprise,
Will swear the seas grow bold;
Because the tides will higher rise,
Than e'er they did of old.
But let him know, it is our tears
Bring floods of grief to Whitehall stairs."

One of the two shields in the spandrels of the doorway bears per pale the Cardinal's own coat-arms, and those formerly borne by the see of York—a carved boss in the vaulting of Christ Church gate, Canterbury (1517) bears the same charge. In July, 1884, the writer, having for a while the advantage of Mr. Cates's guidance, surveyed the area since covered by Whitehall-court and Horse Guards-avenue. Scattered about the waste and uneven ground, and overgrown with grass and weeds, lay the ruins of Fife House; its gardens were dug up, though some of the elm trees remained, the stables were dismantled, and the gateways in Whitehall and Middle Scotland yards thrown down; the Palace Beer Buttery was being "wrecked." Extending from the end of Whitehall-yard lay the stones of the causeway sloping between two side walls to the public river-stairs (see illustrations II.); the exposed stones of the south wall abutting on No. 6, Whitehall-yard, and of the north wall, still bore green marks of water. Similar traces could be seen on the north face of the abutment wall of the bridge at the return with the original river-wall. An etching by Hollar depicts the wooden bridge, beneath which the river ran at flood, with its abutments and the stone steps or stairs beyond which gave access to the boats (a). Laid bare were portions of the lower courses of three massive walls having ashlar on the east face, and set parallel-wise, nearly due north and south, which marked successive embankments of the foreshore. One represented the terrace-wall that extended from the way to the stairs, past the Beer Buttery, and so to the Great Bake House and Scotland Dock; nearer to the river lay a long piece of the later wall which embanked Fife House garden. "The Corte" (since Whitehall-yard) and "Beere House" are plotted in Hoefnagel's bird's-eye map of London made in, or before, 1561 (since it shows the spire of St. Paul's), for Braun and Hogenburg's "Civitates Orbis Terrarum," 1573-1618. A water-gate in the Beer House or Buttery (illustration) gave access from York (or Palace) place and Scotland-yard to the terrace; it was subsequently sub-divided for uses of the Queens of England. The north portion, the Queen's Treasury (E), was assigned to George II.'s wife, Caroline, and the consorts of his successors; the south portion (since 1820 the Royal Almonry, E¹) became the treasury-house of Augusta, Princess-Dowager of Wales, and in 1805 passed to Queen Charlotte; Queen Adelaide there dispensed her benevolence. The business of the Royal Almonry was transferred to No. 36, Spring-gardens, and thence, in 1891, to No. 6, Craig's-court. Between the wine-cellar and the public stairs stood Wolsey's Great Hall, and the Chapel with two vestries, afterwards the site of No. 6, Whitehall-yard (Army Medical Department) and its garden, the way to the stairs descending between an archway under that house, and skirting the garden. Nos. 4 (Lord Gage's), 5, and 6, Whitehall-yard gave way to Horse Guards-avenue, which traverses the sites of the Great Hall, Kitchen and the Master Cook's. In 1764 James, second Earl of Fife, leased a site at the east end of the yard, plotted by Fisher as the Pantry, Privy Buttery, and part of the Pastry, and adding, in 1769, the site of the Kitchen and the Small Beer Cellar of Hollar's print No. IV., built a house of stone and red brick having three stories and no basement (F). Before he made his first embankment, barges discharged the house coal into the cellars at high tide. In 1772, Lord Fife employed Thomas Yeoman, engineer, to make a survey for embanking the foreshore, northwards, from Whitehall-stairs;



Lord Cathcart's House, Whitehall.

for his second embankment (H), on which he built a high wall, he reclaimed an area of about 85 ft. by 200 ft. On February 4, 1803, he writes to the Society of Arts, who had awarded their gold medal to him for his arboriculture in North Britain:—

"Fife House, Whitehall, is a Crown lease. I have made two different embankments, which in the building have cost me many thousand pounds. The first embankment was made about five years after my entry on the lease, and the other twelve years after; they were made at a great expense. All the trees and shrubs planted in these embankments, as also the stones, were brought from my estates in Scotland. . . some of the sines planted in the first embankment measure 3 ft. 4 in. in girth, and above 50 ft. high.

The deportation of Scottish soil, etc., revived the associations of that quarter with the palace inhabited by the Kings of Scotland when they came to our Parliaments. Lord Fife died in 1809, his executors sold the lease to Lord Liverpool, the statesman, who resided there 1812-27. His niece and co-heiress, Selina, Viscountess Milton, married G. Savile Foljambe, who, in 1860-4, let most of the house for the India Museum; the property reverted to the Crown in 1868, and in May, 1869, Fife House and the adjacent Little Fife House (G) were pulled down. Lord Carrington gave the gates to the Duke of Fife for his residence at East Sheen, a part of the staircase was removed to the Museum at South Kensington. Next, south-west, stood on the north side of Whitehall-yard the house—the "goose-py" of Swift's satirical lines—which Sir John Vanbrugh built for himself in 1722-3 out of the ruins of the Palace, and wherein he died on March 26, 1725-6, and his widow, Henrietta Maria, in 1776 (see illustrations I., "Lord Cathcart's"). In 1793 General the Hon. Charles Stuart bought the lease, which passed to his son, Baron Stuart de Rothesay who shortly before his death in 1845 sold his interest to the Committee of the Naval and Military Library and Museum (1830). That body, incorporated in 1860 as the Royal United Service Institution, vacated the house in February, 1895, taking many of the fittings, fireplaces, etc., good specimens of their time, to their new quarters in Whitehall. The materials were sold on August 4, 1897; the sale being the first that was held to clear the site for the new War Office. On the west side of the passage into Middle Scotland-yard stood No. 7, Whitehall-yard, the offices of Arthur Cates, which embodied portions of the Confectionary (I); opposite are the old buildings of the Exchequer Office, now No. 8, Whitehall-gardens. The lease of Carrington House [August 9, 1884, dining-room and staircase], built of brick with stone dressings, after the Palladian manner, on the site of the Palace Wardrobe, in 1764-70, by Sir William Chambers (ob. 1796) for George, second Earl Gower and first Marquis of Stafford, was bought in 1810 by Robert Smith, first Lord Carrington, and remained in his family until the demolition of the house in 1886, when were

found a number of elm piles, with remains of the Palace gate and the road through the great court. In 1885 Colonel Seddon, R.E., had made plans for raising the house and moving it northwards.

Whitehall-gardens.—In 1806 was begun the block of six houses (with gardens reaching to the later river-side) on the site of the apartments of the Earl of Bath, the Maids of Honour, and the Countess of Suffolk, part of His Majesty's lodgings, Mr. Chiffinch's rooms, and the Queen's wardrobe. No. 4 was built in or about 1824 by Sir Robert Smirke for Sir Robert Peel, who there collected the Dutch, Flemish, and English pictures and portrait busts, catalogued in the *Art Union* of 1846, of which some are in the National Gallery and others were dispersed at auction in 1900. Peel died in the dining-room, on the ground-floor, on July 2, 1850. The leases of Nos. 4, 5, 6 expire on August 2, 1923. On the site of No. 6 stood, until 1805-6, the residence of the Duchess Dowager of Portland (see illustrations I.), at the sale of whose museum (in April, 1786, the Barberini, or Portland, vase, the last lot in the sale, realised 1,029*l.*). The house occupied a site taken in or about 1666 by the Earl of Portland, and lying between the Stone Gallery and Queen Mary II.'s "terras walk" or "little garden" which absorbed the Privy Stairs (b). No. 7 marks the situation of the lodgings of Lady Silvis, Sir F. Clinton, Dr. Frazier, Father Patrick, Lady Arlington, the Countess of Falmouth, Queen's Waiters, and Pages of the backstairs. No. 7 now includes Malmesbury House (L), having only two floors; Cromwell House (already cited), next north; Sir John Puleston's; and Pembroke, or Harrington, House to the east (M). The group is entered through the old coachhouse and its door of the last-named house. A covered passage between the stables leads to the narrow doorway set in rustic-work of the house built by Colin Campbell, and drawn in his "Vitruvius Britannicus," for Lord Hertford, afterwards Earl of Pembroke and Montgomery, who in 1744 procured a new lease and took in part of Queen Mary's terrace. The front elevation, now concealed from view, has an Ionic tetrastyle order with pediment on the first floor. The former limits of the site may be traced in the garden, where is the old bathhouse (m) entered from a passage in the basement. In 1838 Charles, fourth Earl of Harrington, the eccentric Lord Petersham of the Regency, took a sub-lease from Robert, Earl of Pembroke, and in 1843 enlarged the house on the south side. Having formed the War Office in 1855-9, the time of the Crimean War and Indian Mutiny, No. 7 next became the Foreign Office; in 1865-6 the Board of Trade migrated thither from Treasury buildings. The late Renaissance decorations of Harrington House extend to the door-frames, walls, and ceilings; the principal rooms have mahogany double-doors, the main stairs have a handsomely wrought-iron balustrade. Malmesbury House, leased in 1788 to

James Harris, the diplomatist, and first Earl of Malmesbury, was built in or about 1725 on the site of the "organ-builders' workhouse"—the workshop of Bernard Schmidt "organ-maker in ordinary to King Charles II.," who there built the organ for the Chapel Royal, and of his son-in-law and successor, Christopher Schneider, No. 8 (Board of Trade) was the old Exchequer Office, No. 3, Whitehall-yard (J). Montagu House, projecting into Privy-garden, covers the sites of the south end of the Stone Gallery, and the apartments of the Earl of Bath, Earl of Lauderdale, Duke of York, Prince Rupert, Lord Peterborough, and Mrs. Kirk. The former mansion, pulled down in 1859, was built in 1733 for John, second Duke of Montagu, whose grand-daughter Elizabeth brought it in marriage, 1767, to Henry, third Duke of Buccleuch. The ninety-nine years' Crown lease of the present house, built in 1859-60, after designs by William Burn (ob. 1870) for the fifth Duke, expires in 1954.

Banqueting House, and R. U. S. Institution.—James Wyatt (ob. 1813) added the annexe for the staircase and vestibule in 1798. The exterior stone-work had fallen into decay as early as the time of Pope—

"Shall half the new-built churches round thee fall?
Make quays, build bridges, or repair Whitehall!"
—Satire II.*

* Confer also—
"See under Ripley rise a new Whitehall,
Whilst Jones, and Boyle's united labours fall."
—Dunciad III.

and in 1829-37 Soane re-cased it, Sir Robert Smirke restoring and refitting the interior, at a cost of some 15,000*l.* Smirke took down the Guards' gallery and closed in the middle row of windows with oak panelling which was used in the conversion of the Chapel Royal into the Royal United Service Institution Museum in 1891, when the brick vaulting of the lower floor was plastered and its windows, for the first time, opened out. Dover House stables (R), next adjoining, were built after 1796, and before 1810 on the site of the Lord Chamberlain's and the Lord Keeper's rooms. In June, 1892, the R.U.S. Institution accepted from the Treasury an offer of an eighty years' building lease of the ground at a rent of 350*l.* for the first year and 580*l.* for the remaining period. Messrs. Mowlem & Co. erected the new buildings (May 13, and September 16, 1893, three views and two plans), after designs by Sir Aston Webb, R.A., and Mr. E. Ingress Bell. The task was a difficult one: in their solitude to leave unimpaired the "solemn state" of Jones's work, the architects set back the two elevations and inserted a plain break between the two portions of what is now practically one building. Some may think that their façades effect too great a contrast. Still, the area is confined, whilst a lecture-theatre, a large library, with many rooms, and communications on different levels with the museum were required. Gwydyr House, built in 1795-6 by John Marquand, Surveyor to the Woods and Forests, for the first Lord Gwydyr, formed the first home, in 1832-40, of the Reform Club, and

has since been occupied by the Poor Law, now the Local Government, Board (about 1866), the Charity Commissioners (1876), and the Board of Education (1893). In 1884-5 the attics were converted into a top-floor; an addition made on the south side in 1898 projects into the Privy-garden on to the site of the dial (Fig. 2) constructed by Edmund Gunter for Prince Charles. Nicholas Stone made the pedestal; in his MS. "account book" he enters: "And in 1622 I mad the great dial in the privy garden at Whit Hall for the wich I had 46*l.*"

Chawner built Richmond-terrace and the stables in 1824-5 on the site of the houses of Lord Loudoun and the Duke of Richmond four years after the Duke had sold his twenty-one years' interest in the property for 4,300*l.* The first Duke procured a lease in 1711 of the site on the Bowling-green of his mother the Duchess of Portsmouth's lodgings. Lord Burlington built the house, facing northwards, for his successor, whose son added in 1758 a gallery of casts from the antique, which, with unwonted liberality, he opened to students; see the *Chronicle* of February 2, 1758. In or about 1778 the Duke rebuilt that portion which abutted on the river-wall, surmounting a bastion, and is delineated in Canaletti's picture. James Wyatt reconstructed the mansion after the destruction of the gallery and other parts by fire on December 21, 1791 (P). In the Gardner collection is Capon's drawing of Loudoun House (O), which stood to the west of the Duke of Richmond's; it had been built *temp.* James II. on the Bowling-green, and having been subdivided and inhabited by the Earls of Mar and of Loudoun, was bought by the third Duke of Richmond. Chawner's drawing, 1827, of the elevation of Richmond-terrace, 253 ft. 6 in. long, is in the Craze Collection.

The Government Offices.—That history really begins in 1809 when John Adey Repton (ob. 1860), being then thirty-four years of age, won the first premium with his designs for public buildings on what is now the site of Parliament-square. The entire story comprises many episodes which need not be rehearsed after the lapse of years. They will be found in volume after volume of reports, evidence, projects, and plans—testifying to the procrastination, near-sighted, albeit wasteful, economy, departmental jealousies, and partisanship of the government and their non-professional advisers. We will repeat no more than we cannot help in order to render our epitome intelligible. For the block of offices northwards from Downing-street, Soane pulled down Nos. 1-9 on the north side of that street, and the adjacent tennis court (Fig. 2). Captain Cooke, master of the King's tennis courts, and Robert Long, the King's marker, built the court (T, Fig. 3), after the model of that at Hampton Court, for Charles II. in 1662-3, over Lord Sandwich's garden, on a parcel of land called the Brake. In the Pells Dormant Privy Seal Posting Book, vol. v., fo. 78d., we find:—

"5 Sept., 1804. To Mr. Kyrryn towards the repairs of the Tennis Court commonly called the Brake at Whitehall: 200*l.*"

"Long's" is mentioned in Shadwell's "True Widow," 1679. The "Long Gallery next the brake," the "Close tennis court," and the "Little tennis court" are named in a bill for repairs belonging to a series of accounts relating to public works and buildings, 1600-1, preserved in the Record Office. Soane pulled down also the houses facing Whitehall, of which he made a coloured drawing, whereof, by the courtesy of Mr. Walter L. Spiers, curator of the Soane Museum, we give an illustration. At that time, 1824, those houses were occupied by the Board of Trade and Plantations, and the India Board of Control: *confer* Marquand & Leverton's plan of 1804. Between them and Dover House stood the much older building, to which we will revert as the "Old Tennis-court" (S), whereof the west wall is incorporated in the more modern work. Soane's first designs presented front and return elevations relieved and elaborated with a continuous colonnade and a more diversified parapet; his model, in the Soane Museum, embraces a bolder and larger treatment of the north end of the block and a corresponding block to extend southwards from Downing-street, with a triumphal arch across that street to connect the two blocks. He intended that the arch should be adorned with sculpture and to erect a similar arch opening into the Park from the remoter end of Downing-street, the two to stand across a processional road to the Houses of Parliament. Soane's building, 1824-8 (see illustrations II.),



Fig. 4. General Plan: latter half of XIXth Century.

the present day is an anachronism; but it is at all events, in this case, a picturesque anachronism.

A HALL IN TENNYSON'S "PALACE OF ART."

TENNYSON'S dream-like poem, "The Palace of Art," has always fascinated me with its succession of word-pictures and descriptions. Some years ago I made an attempt in the *Builder* at an idea of its exterior aspect. This is supposed to be one of the many interiors through which the soul wandered, as described in the quotation. H. H. S.

"PEACE": DESIGN FOR THE DECORATION OF A PUBLIC BUILDING.

THIS design, which we have already noticed as having gained the Royal Academy Prize in this class of work, sufficiently explains itself, except that we may mention that the space given for the design, showing a wall cut into by a semi-circular arch, was furnished in a diagram to the competitors, part of the problem being to fit the design to a special position.

As we have before said, we think this method of illustrating "Peace" is rather vague, but as the Academy accepted it we may suppose that they considered it to come within the terms of the subject given, and there is no doubt that it was the best work sent in. It has the merit also of being really a decorative design, with no pictorial character whatever in it. We give also a reproduction from the life-size cartoon of one of the figures shown in the general design.

The artist is Mr. G. Howard Short.

LOGGIA DEI LANZI, FLORENCE.

THIS Loggia was originally known as the Loggia dei Signori. It is said to be from a design of Orcagna dating about 1356; it was not built till twenty years later; the names of Benozzi di Cione and Simone di Francesco Talenti are given as the architects. This form of open-air hall was a feature of Florentine palaces, and in the present instance it was doubtless the stage of many impressive and gorgeous public functions, the Piazza della Signoria holding the audience. It is now a gallery of famous sculptures. Benvenuto Cellini's Perseus, with the head of the Medusa, is shown on the left. The lion shown is not the antique one, but that by Flaminio Vacca. Menelaus with the body of Patroclus, a restored antique, is shown in the near foreground; the group behind this is modern. The statues at the back are antiques.

The drawing was made on the spot by Mr. A. C. Conrade. Many illustrations of the Loggia from the exterior have been published; but a view taken from the interior is not common; indeed, this is the first we have seen.

THE CHURCH OF OUR LADY OF RESTELLO, BELEM, PORTUGAL.

THERE existed in mediaeval times a small chapel at Restello, a place between two and three miles from Lisbon, and towards the mouth of the Tagus. It was founded by Dom Enrique, the Infante, for the special use and benefit of sailors.

Before sailing on his voyage to the East Indies, on July 8, 1497, Vasco de Gama paid his devotions here; as also on the occasion of his return, about two years later.

It was to commemorate the momentous results of this voyage that Dom Manuel I. (1495-1521) erected over the site of the small chapel the present sumptuous church of Our Lady of Restello. It is in a style like the later or Ogival Gothic of Spain, with some local differences. The decorative work is of the Plateresque school, and is most elaborate and highly finished. The sculpture, with which it is profusely adorned, is of high merit and interest. The portal is very rich in its composition, with figures, brackets, canopies, and foliage, etc., most effectively treated.

There are in the interior statues of Our Lady (under a superb canopy), St. Michael, Dom Manuel I., and many others. Some of the Royal tombs of Portugal are in the vaults of the adjoining convent. The buildings at Belem are among the finest of the few remaining specimens of mediaeval Portuguese Gothic. A. C. C.

KINGSTON BRIDGE.

In a note in our issue of October 5 last year (page 356) we gave some account of the history of Kingston Bridge, in view of the fact that there was some talk of rebuilding it. We hope

however that this threat will not now be carried out; at all events we understand that if the bridge is widened, it will be done by rebuilding one side on its present design.

One never knows, however, what may be done when an old bridge is once meddled with, and therefore it is well to have a record of Kingston Bridge while still intact. Mr. W. Monk has made an excellent drawing of it; and though it is not equal to old Kew Bridge, it is a fine example of that kind of simple but dignified structure which is so much more effective than the supposed "ornamental" treatment with which many modern bridges are bedizened.

LUTON CHURCH, BEDFORDSHIRE.

REFERENCE has recently been made in these columns (*Builder*, November 12, 1904) to the proposed repair of the fine church of Luton. Its western tower, the chief feature of the exterior, of flint and stone, is shown in one of the plates, and the most interesting feature of the interior, the baptistry, an octagonal structure enclosing the font, is illustrated in the text. The diameter of the interior of this baptistry is about 7 ft. 4 in., and its total height 20 ft.

It stands in the centre of the nave, in the second bay from the tower. The font itself, with an octagon bowl, a central drum, and surrounding detached columns, is, with the

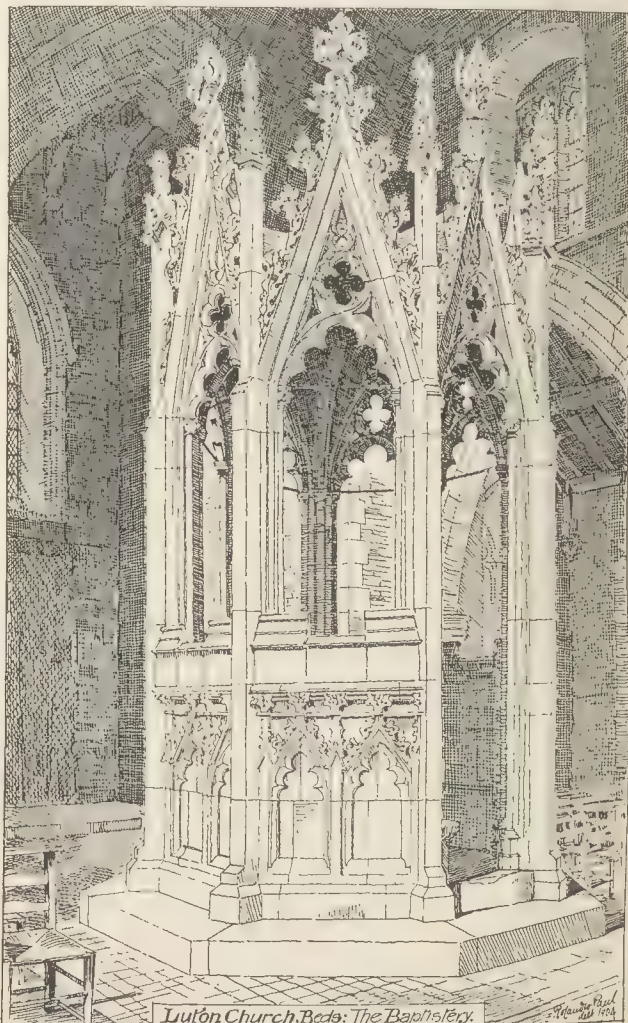
exception of the latter, of Purbeck. The other chief objects of interest are the Wenlock chapel and tomb, the sedilia on the south side of the chancel bearing the motto of Westminster, Abbot of St. Albans, and the Easter Sepulchre on the north side of the chancel, this latter being of earlier date.

DECORATIVE TREATMENT OF KING'S CROSS STATION FACADE.

THE front of King's Cross Station, plain and unassuming as it is, is the best and most sensibly treated railway station facade in London, as it is not an unmeaning screen, but really expresses the structure in its rear, the two large arches corresponding with the two internal roofs.

Mr. A. C. Dickie has suggested in this drawing a decorative treatment of the facade in various coloured marbles, for which its simple style and expanse of flat surfaces renders it very suitable.

Mr. Dickie writes, in explanation of his design:—"The lines of the present brick design have been retained in every respect. The marbles which are least affected by the London atmosphere, and which would be adaptable to the colour scheme, are green and red serpentine, Jura buff, and alabaster. The lower projecting arcade is intended to be in green and red serpentine banded; and the



Luton Church, Beds: The Baptistry.

towers, arches, and spandrels to be buff Jura ground with panels formed of green serpentine slips. The upper panels of the towers to be red serpentine, and the outer ring of the two arches to be in the same marble. The inlay enrichment on the cornice to be green serpentine on a Jura buff ground."

The design was of course made in colour, and we should have wished to have reproduced it so, but the cost, unfortunately, was prohibitive. The general effect can, however, be judged by the monochrome reproduction in conjunction with the author's description.

ILLUSTRATIONS OF OLD LONDON SITES.

THESE views are taken from plates in the Grace Collection in the British Museum; they are given as illustrations of the article in this issue on old London sites in the neighbourhood of Whitehall and Charing Cross, and must be taken in connexion with that article.

The title "Scotland Yard" on No. 2 sheet is a mistake in the lettering of the drawing in the Grace collection, which was copied here before we discovered the error. It should be "Whitehall Yard" or "Court"; Scotland Yard was higher up to the right.

SOME OLD LONDON HERALDRY.

OF the six heraldic stones illustrated only one—the shield from St. Saviour's Church, Southwark—is now in *situ*. Of the other five, three (the lion and shield from the Strand and the two examples from Clare Market) are now in the possession of the London County Council at Spring Gardens; the remaining two form part of the collection at the Guildhall Museum.

The arms and supporters of Gilbert Holles, Earl of Clare, were about ten or eleven years ago on the front of a house over what was known as Gilbert's passage. A good reproduction from a photograph of this house will be found in the *Westminster Budget* of August 25, 1893. On the demolition of this house the arms were preserved, and afterwards placed on the first floor level of No. 8, Holles-street, and so remained until that street, with others in the vicinity, was demolished to make way for the new Strand and Holborn thoroughfare. The earl's coronet is much mutilated, but the arms themselves are well preserved, also the inscription with date 1665, and the motto *SPES AUDACES ADJUVAT* on the ribbon below.

The smaller panel, with two Blackamoors' heads and initials and date 1715, were until recently on the angle of the house at the junction of Holles-street and Clare Market. The third panel—with a lion rampant and shield charged with the Arms of the City, was on the first floor of No. 342, Strand (at the corner of Catherine-street).

Before the demolition of the Old Bell Inn, Holborn, with its picturesque galleries, the well-carved panel with the arms of Grege, now in the Guildhall Museum, occupied a prominent place on the Holborn front of the inn. Considering its exposed position, it is in excellent preservation. Another panel in the same museum has a well-carved eagle, a part of the crest of the Stanley family, brought from Crooked-lane, E.C.

SCULPTURE: "L'OFFRANDE A L'AUTEL DE L'AMOUR."

THIS group, at once poetic in fancy and admirable in sculptural execution, was a prominent exhibit in the sculpture hall of the Paris Salon last year.

The sculptor is M. Hector Lemaire.

LIBRARY, KINROSS, N.B.—A new public library is to be erected at Kinross from plans by Mr. Peter L. Henderson, Edinburgh, whose design was selected in competition. The building is in two stories, the upper flat containing a house for the librarian, and a museum, while on the ground floor are—on the left of the entrance, a lending library for 6,500 volumes; on the right, a reading-room, and at the back a hall to accommodate 150 persons, with retiring-room, lavatories, etc. At the back of the hall is a small gallery, to accommodate about thirty persons. The front is a battlement tower in the centre, bearing an inscription tablet, and flanked on the one side with a crow-stepped gable, and on the other with a pavilion roof and dormer.

COMPETITIONS.

SCHOOL, POULTON-ROAD, POULTON, CHESHIRE.—The following is the result of this competition:—1st premiated design, Messrs. Thomas E. & James Murray, 10, Blandford-road, Bedford Park, London; 2nd, Messrs. Farmer & Williams, Prudential-buildings, 36, Dale-street, Liverpool; 3rd, Mr. Joseph Holt, Scottish Prudential-buildings, 9, Albert-square, Manchester.

SECONDARY SCHOOL, POOLE, DORSETSHIRE.—Designs for the new secondary school, to be built on a site at Seldown, given to the borough by Lord Wimborne, have been sent in for competition for the premiums offered by the education authority. The committee in making their awards were assisted by Mr. John Elford (Borough Surveyor) and Mr. S. J. Newman (Surveyor to the Branksome Urban District Council). The result is that the first premium of 30*l.* has been awarded to Mr. G. Bligh Livesey, of Parkstone, and the second of 15*l.* to Mr. Walter Andrew, also of Parkstone.

Books.

The Architect's and Builder's Pocket-Book: A Handbook for Architects, Structural Engineers, Builders, and Draughtsmen. By FRANK E. KIDDER, C.E., Ph.D., Fellow of the American Institute of Architects. Illustrated with 1,000 engravings, mostly from original designs. Fourteenth Edition, rewritten. New York: John Wiley & Sons. London: Chapman & Hall, 1904.

IF the reader judges of this book by its title he will probably form a most inadequate opinion of the enormous amount of instructive material which it contains. We do not feel confident to give an expert opinion upon the proportions and tensile strength of pockets as designed in the United States, but it is problematical whether many architects in that country will find it practicable or convenient to carry about with them a "pocket-book" measuring about 7 in. by 4½ in. by 2 in. thick, and weighing nearly two pounds. Nevertheless, the claim made by this portly volume on the capacity of its owner's pocket is small as compared with the demand which its contents make upon his mental receptivity. In writing his first edition, some twenty years ago, Dr. Kidder aimed at giving to architects and builders a reference book occupying a position analogous to Trautwine's pocket-book for engineers—comprising practical data, rules, and tables, relating to building construction. That edition, although requiring three years for its preparation, contained only 586 pages, and could fairly be called a "pocket-book." As time passed by, so many developments took place in connexion with building construction that, at last, in spite of the revisions made in thirteen consecutive editions, the author decided to enlarge the scope of his work, and the present edition, containing nearly 1,700 pages, is the result. It may be convenient if we state here that in the latest revision the author had in view the production of (1) "A reference book which should contain some information on every subject (except design) likely to come before an architect, structural engineer, draughtsman, or master-builder, including data for estimating the approximate cost. (2) To as thoroughly cover the subject of architectural engineering as is practicable in a handbook. (3) To present all information in as simple and convenient a form for immediate application as is consistent with accuracy. To this end, a great many new tables, arranged and computed by the author, have been inserted." In view of the comprehensive programme here set forth, it will be readily understood that the author found it necessary to make a very considerable addition to the size of the volume, which is now an invaluable adjunct to the office or drawing-table, although its original title of "pocket-book" is still retained.

The book is divided into three parts, of which the first and third are subdivided into paragraphs, and the second into chapters, a somewhat meaningless lack of uniformity. Part I. is devoted entirely to units of weight and various mathematical data. In the compilation of such matter it is very difficult to know where to stop, but the author has included very little in the way of unnecessary data and tables. Part II. is entitled "Strength of Materials and Stability of Structures," and comprises twenty-eight chapters covering nearly 1,000 pages. After disposing of preliminaries, the author

commences in Chapter II. the consideration of "Foundations and Spread Footings." A useful term is employed in these pages to distinguish between the real foundation of a structure and the earth on which it rests, sometimes incorrectly described as the "foundation." It is here designated as the "foundation-bed." The most noteworthy part of this chapter is to be found in the section dealing with "Spread Foundations," a heading under which the author describes various types of such work more familiar to American than to British architects, among them being the following:—(1) Concrete footings with twisted or other forms of iron tension rods, making the transverse strength of the footings equal to that of steel beams. A table on page 160 giving the strength and properties of footings constructed in this way will be found serviceable as a check upon calculations. (2) Steel beam footings, for wide foundations of small height, as largely used in Chicago. Referring to these the author expresses the opinion, with which we quite agree, that it is doubtful whether steel footings will prove as durable as those of masonry. (3) Caisson foundations, the chief value of which is in connexion with the erection of heavy buildings over treacherous soils, permitting a bearing to be secured on solid bed-rock at considerable depths.

Passing on, the author discusses the construction of masonry walls and footings, retaining walls, and vault walls, and gives data relative to cements and concretes, and to the strength of brickwork, stone masonry, and concrete masonry. Then comes a theoretical chapter dealing with the composition and resolution of forces and the centre of gravity, subjects that could have been treated just as well, and a little more appropriately, in the preliminary portion of Part II. Still, the chapter is not altogether out of place, as it serves to explain the graphic methods applied in Chapters VII. and VIII., wherein are considered the stability of piers, buttresses, and arches, the latter of these chapters being an excellent little treatise on arch construction. "Moments of Inertia and Resistance, and Radii of Gyration" receive very ample attention, and, after methods of calculation have been explained, a series of voluminous tables is given containing the dimensions and properties of numerous sections of structural steel. The value of these tables is comparatively small to British architects, as the sections in question are based on American standards, and in many cases relate to special sections rolled by certain firms in the United States. Without intending any discourtesy to the author, we express the hope that the usefulness of the tables in this country may be still further reduced by the universal adoption of the British standard sections recommended by the Engineering Standards Committee. Chapter XI. on "Resistance to Tension" is another comprehensive section of the volume, and among the chief matters dealt with are the physical properties of iron and steel, the strength of rods, ropes, and cables, and the proportions of screw ends, eye-bars, and turnbuckles. The question of resistance to shear raised in Chapter XII. naturally brings under consideration the proportions and strength of riveted joints, and the strength of pins and bolts, these being subjects to which far too little attention is paid in architectural engineering. After dealing briefly with the proportions of cast-iron and steel-bearing plates for columns, beams, and for brackets on cast-iron columns, the author goes fully into the strength of columns in a chapter which contains a vast fund of information, although unfortunately many of the tables relate to special forms of columns made by various American firms. We are glad to see that due emphasis is laid on the necessity for taking into account the effect of eccentric loading. In this chapter numerous useful diagrams are given of steel column sections, connexions, and base plates. No less than six chapters, covering 150 pages, are devoted to different forms of timber, stone, cast-iron, and steel beams. This portion of the handbook should be widely appreciated by architects and builders alike.

"Mills and Warehouse Construction" is the title of a chapter which deserves special notice. As understood in the United States, the term is employed to describe a special system of construction which, although not what is commonly called "fireproof," has the effect of reducing fire risks very considerably. The notes given by the author will be found of much interest, and it may be mentioned that they

are taken from an illustrated report issued by the Insurance Engineering Station, Boston (U.S.A.). The next two chapters, entitled "Fire-proofing of Buildings," and "Fire-proof and Incombustible Floors and Flat Roofs," respectively, leave very little unsaid on these subjects, and contain, moreover, an excellent series of notes relative to concrete-steel beam and floor construction. The remainder of Part II. is occupied with the discussion of roof trusses, and wind bracing. The various types of trusses are well described and illustrated, and simple methods are stated for the computation of stresses, and for determining the proportions of the members of roof trusses. The concluding chapter on "Bracing" is particularly worth careful study.

Part III. covers about 530 pages, and rejoices in the comprehensive title, "Useful Information for Architects, Builders, and Superintendents, and all who have to do with the Building Trades." It is true that a fairly large proportion of the information has little value to the British architect. Among such matter we class numerous estimates of cost based upon American prices, tables relative to the dimensions of various purely American fittings of different kinds, lengthy price-lists of common and plate-glass, reprints of legal enactments, and a brief trade directory of manufacturers in the United States. Other information of encyclopaedic character is included, which, although interesting, can scarcely be looked upon as necessary in a practical handbook. Still, making allowance for all non-technical material in this part of the volume, there remains much that is quite to the point. Heating and ventilating systems are thoroughly discussed, as also are chimney construction, hydraulics and plumbing, gas lighting, and electric lighting, while the voluminous series of notes and data upon other matters connected with building construction represent an immense fund of information which the architect can draw upon for the refreshment of his memory, or the student for the acquisition of knowledge.

Dr. Kidder's pocket-book is less a collection of notes such as are to be found in Molesworth, than a small library of text books bound in one cover. Speaking generally, it is well up to date, and when lack of space has prevented the author from dealing at sufficient length with any particular subject, he has given references to books or technical journals, so that in such cases his work serves as an index to other sources of knowledge. The task which the author set himself was a great one; it has been admirably performed, and he is to be thoroughly congratulated upon the result achieved.

Ornament and its Application. By LEWIS F. DAY. London: B. T. Batsford. 1904.

"It is strange that there should be any occasion to insist upon the necessity of knowledge, and to combat the common superstition that the artistic faculty, because it is inborn, is all-sufficient."

This, from p. 5 of Mr. Day's Introduction, is a very good text for any dissertation upon the principles of Ornament and their application.

The book before us is not the first from Mr. Day's pen having for its subject the nature and evolution of design. His method here, as elsewhere—although the examples are almost all from more or less "historic" sources—is not that of the archaeologist or of the amateur, but is rather that of the craftsman applying his knowledge of to-day's work to the study and consideration of what has been done in the past. His book is admirably written and ingeniously planned. Perhaps only those who have themselves tried to write a technical work can at all appreciate the problems which arise in connexion with what a writer calls "Method." How to preserve, in a wide and scattered field of facts, some semblance of order and consequence is the question which has to be faced and answered. To those not already familiar with Mr. Day's methods a word must be said. In the work before us there must be said. In the work before us the purely conventional treatment of Ornament comes first. Then we have a chapter on the meaning of Applied Art. We are next led to a chapter designated the Teaching of the Tool. And then Mr. Day inserts two cleverly written chapters called respectively "Where to stop" and "More than enough." Later on special sections of the work are devoted to "processes," and there is a very good one on "Partnerships." The work ends (p. 297) with a refreshing return to one of the foremost

principles of any scheme of decoration—"The inevitable line."

Of necessity such an arrangement of subject matter provokes some redundancy of illustration, and precludes the possibility of keeping the various crafts even for one moment separate. With this in his mind, the author has given us a most useful syllabus of illustrations, arranged alphabetically under their subject. This extends from pp. 1-32. With this list itself we might begin what we have to say by way of caveat. Under "Human Figure" we should expect references not only to a good deal of talk, but to a fair number of illustrations. We are referred to one only, Fig. 271. Inasmuch as there is no first-rate series of examples in the book covering so very important a basis for decorative effect, the few illustrations which might serve should, we think, have been enumerated, such, for instance, as Figs. 143, 150, 153, 155, 242, 257. In the text some deeper insistence on the peculiar and excellent treatment of the human figure should surely have found a place where Greek Vase Painting and the Majolica of Renaissance times came up for consideration. We pass from this to a word about that section of the work devoted to "Pottery." These are but small points, but perhaps worth raising, when a book obviously aims at thoroughness. Under "Pâte sur pâte," something might in another edition be said about Wedgwood, his experiments, and ultimately fine results. M. Solon, whose work is praised by the author, learnt something from Wedgwood. The personal equation is very much manifest in the following passage:—"Where is the piece of Sèvres or Dresden china to compare with a fine bit of Nankin blue and white porcelain?" Their aims are very different, and some of us have a use for Sèvres (don't let us put Dresden beside it) which Nankin cannot fulfil. After all the first charm of Sèvres is the symmetry in its design; it is felicitous above all other ware in the proportion between its deep-coloured borders and the white space left for individual painting.

A word about the choice of plates—among so many good ones we should have liked to see, as illustrations of Ironwork, some examples of English and French work of the XVIIIth century. This is a noticeable omission. With regard to book-binding, it is impossible to gather much from one of the illustrations (p. 284). It might be an example of either appliqué or insid leather ornament; or again of painted or stained work—the paint applied after the tooling had been executed—a fashion common in England, Germany, and the Low Countries after 1610. This example is evidently German and is rather coarse in treatment.

There are one or two misprints scattered about the book, but the only one we noticed as rather a nuisance was on p. 287. Here the reference to the picture of The Assumption should be 285 and not 185.

In another edition—for which we hope a well-justified sale of this issue will afford an excuse—we should like to see properly treated, in a little section by itself, Heraldry, as a subject matter for design. It is ignored in the present volume. Lastly, when so much has been said of individual artists down to a welcome appreciation of Mr. Walter Crane, the next edition need not leave out the Brothers Adam.

Old Cottages, Farms, and Other Houses in Shropshire, Herefordshire, and Cheshire. Photographs by J. W. PARKINSON, with notes and sketches by E. A. OULD, F.R.I.B.A. B. T. Batsford. 1904. Crown 4to.

THIS book is a companion volume to that recently published by Mr. Batsford on the old cottages and farmhouses of Kent and Sussex, the work of Messrs. W. Galsworthy Davis and E. Guy Dawber. The new volume is confined to half timbered work of which the counties treated of are still rich with examples of that style of architecture. Mr. Ould in his descriptive notes points out the characteristics of the work in these counties. The scantlings of the timbers used is heavier, and there is more variety and richness in the constructive forms themselves than in the southern counties. In the first case Mr. Ould suggests as an explanation that timber was more abundant where it was never used for ship-building or iron-smelting; in the second the geometric patterns and elaboration of the struts to the framing he attributes to the trees used which supplied more distorted and crooked timber than straight. The notes also contain an analysis of timber building construction, a

form of construction now unfortunately seldom adopted but none the less interesting for that. We do not remember seeing this class of building described in any work or building construction. Few and favoured are the spots where the law will still admit of its use, and few the clients who will pay for it; English oak is difficult to get as it is being supplanted by the inferior but more easily worked foreign varieties. Oak buildings are extraordinarily durable, witness Greenstead church, described in our last issue, built probably 900 or 1,000 years ago, the timber still sound and so hard it is difficult to touch it with a saw. There are, however, few half timbered buildings left of an earlier date than the beginning of the XVIIth century, the bulk of it belongs to the XVIIth. The present work shows a collection of exceedingly good photographs which will one day form a valuable record of a manner of building growing rarer year by year. Of all styles of building half-timbered work is the most picturesque, vide plates IX., XVII., XIX., XLVII., LV., LXXXI., story projecting over story and thatched gable over all, on lines strictly scientific the soundness of which is approved by time. In half-timbered houses the chimney gains special prominence from having to be built of stone or brick. Their generous size adds much to the appearance of the building, what could be more delightful in this respect than the cottage shown in plate XIX. Plate LXXXI., again, is charming; these houses seem to fit into the country and harmonise with the surroundings like birds or insects with protective colouring. They are little masterpieces in their way of which their builder designers were happily unconscious. They are probably well satisfied with the pleasure derived from doing the work. The book is nicely got-up and worth the guinea that will buy it to all who love things beautiful or old.

The Cathedral Church of Saint Asaph. By PEARCE B. IRONSIDE BAX. London: George Bell & Sons. 1904.

LIKE preceding volumes of this series of cathedrals, this latest addition, dealing with the history of the church and See of Saint Asaph, in North Wales, is excellent both in letterpress and illustrations, the latter being chiefly from photographs expressly taken for the work. Considering its chequered history it is fortunate that so much of the mediæval church has been spared to us. Its chief characteristics are extreme simplicity of detail both inside and outside, and the effect of spaciousness given to the interior. The church has also the advantage of occupying a fine position on high ground above the river Clwyd. A good deal of restoration was carried out in 1868 under Sir G. G. Scott, during which the fine original Early English windows of the presbytery were found. The remainder of the fabric is almost entirely of XIVth century date, the window tracery being particularly effective. The canopied stalls in the choir are mostly ancient and of Perpendicular date. The throne and much of the woodwork of the choir are, however, modern. It is to be regretted that the monumental slabs were removed from the presbytery floor to make room for a new tile pavement, and it would add interest to that part of the church, if they could be placed in positions as near as possible to their original sites. The fine effigy attributed to Bishop Annian stands at present against the south-west pier of the tower. Another ancient slab with a curious shield of arms has been placed in the north transept floor, and a third slab, in the south transept, with a cross, is supposed to have covered the grave of Bishop Wm. de Spridlington (who died in 1382), and was removed at the restoration from the east end of the choir. A chapter is devoted to the history of the See, and short notices are given of the bishops. Following is a list of deans, and a ground-plan of the church to a useful scale, showing the site of the destroyed chapter-house on the north side of the presbytery. In addition to the views of the church, good photographic illustrations are given of the small parish church of St. Asaph, between the cathedral and the river, and of the picturesque ruins of Rhuddlan Castle, on the banks of the Clwyd between St. Asaph and the sea.

A Synopsical Monograph on the Abbey of Fécamp, Normandy. By J. ATTWOOD SLATER. London: Sprague & Co. 1903.

THE chief feature of this monograph on the interesting Benedictine church of Fécamp is a

series of illustrations reproduced from drawings and photographs by the author—twelve plates in all supplemented by a ground plan. The ground plan is, unfortunately, to a very small scale, and, consequently, is lacking in detail, but it shows well the Benedictine arrangement and is interesting to compare with buildings of the same class in England—with Tewkesbury Abbey Church, for instance—which it much resembles. An earlier church was destroyed by fire in 1165, and the greater part of the existing building was built between 1171 and 1220. The beautiful Lady chapel, however, is of XVth century Flamboyant work, so are the windows of the chapel on its south side, and what remains of the pulpitum that formerly occupied the ninth bay of the nave. This pulpitum when perfect must have been an exceedingly striking feature of the interior. Its position is still clearly marked by canopy work attached to the eighth pair of piers, and the traces of side screens under the arches of the ninth bay. A fragment has also been placed in the north transept against the wall, much in the same way, apparently, as in the case of the fine work at Salisbury Cathedral, and a good idea of its delicacy of workmanship is given in Mr. Slater's drawing in one of the plates. Of the other details, the choir stalls, the organ case at the west end, and the stone screens dividing the chapels of the great apse from the ambulatory, are all of Renaissance work. The west front was rebuilt in 1748 in the style then in vogue, and, it need scarcely be added, with details utterly out of keeping with the remainder of the church.

Among the features of interest are some tombs of the abbots, and stained glass of the XIIIth and two following centuries, the greater part of the latter being in the windows of the Lady chapel.

Three illustrations—two from photographs—are also given of the picturesque but simple chapel of Notre Dame du Salut. A good deal of character is given to an otherwise plain exterior by the use of brick and stone in broad alternate bands, in the construction of the buttresses.

While praise may be bestowed on the plates (we should have liked to see some measured sections and details, however, as well), it is to be regretted that, in the letterpress attached to them—ten pages in length—much of it is so spoiled by an eccentricity of style as to be almost unreadable. "Concoctions of a wizardly goodness, and sagacity, of ravishing and supreme advantage in tone" and much more in the same strain constitutes a large part of the notes, and, although much may no doubt be put down to enthusiasm, some plain facts about the building, put in plain English, would have been preferable. The ten pages devoted to the building are none too many in which to record the numerous fine and interesting details of a building of this class. As it is, much is obviously omitted that should have been included, and its place usurped by outbursts that are, to say the least, irritating to the reader.

TRADE CATALOGUES.

We have received from the Edison & Swan Company, of Queen-street, London, a leaflet illustrating the "button" switch, for use in electric lighting circuits. In our opinion this switch is a great improvement on the "tumbler" switch which is now almost universally used. In appearance it is similar to the switches used with electric bells. By pressing a push the lamp is lighted, and when we wish to turn out the light the push is pressed in exactly the same way. The cycle of operation required is performed by merely pressing the button twice, and thus it can be done by one finger only. It is impossible to receive a shock, as the button is made of insulating material. These switches are made in several patterns, and some of them can be let into the wall directly, as the mechanism is all boxed in by a metal cover, and so can be made flush with the surface. The only objection we can think of to this type of switch is that, in the event of the filament of the lamp being broken, we should be unable to tell whether the switch was "on" or "off." In another leaflet a switch plug which acts automatically is illustrated. It is suitable for high voltage circuits, and meets the requirements of fire insurance offices.

Mr. Peter Brotherhood sends us his new catalogue of air-compressing machinery, a pamphlet which is devoted chiefly to the

description of vertical steam-driven compressors, the compound two-stage type being selected for special attention as a representative example of the many combinations possible. We may mention that the one-stage type, of which an illustration and brief particulars are given, is suitable for air pressures varying from 20 lb. to 80 lb. per sq. in.; the two-stage type for pressures from 80 lb. to 250 lb. per sq. in.; and a five-stage type, also illustrated, for the working air pressure of 3,000 lb. per sq. in. References are made in the catalogue to electrically-driven and belt-driven compressors, and among a few auxiliaries described, a patent clutch coupling and a flexible shaft coupling are worthy of special note. The last mentioned, primarily intended for connecting the rotating shafts of engines and dynamos, may frequently be found of service for coupling any two shafts that are not in perfect alignment, and without causing bending strain in either shaft, or waste of power due to excessive friction in the bearings.

Messrs. Knights & Drake send us a circular describing their patent plant for producing concrete paving slabs. The apparatus consists of a mould in the form of a box, on the bottom of which the first slab is made. A horizontal wooden partition is then inserted, on the top of which another slab is formed, and so on until the mould is full. The whole series of slabs—eight or ten in number—is then turned out to harden, and in about twenty-four hours the slabs are ready to be separated, and the wooden sheets can be removed for use again. Compression of the concrete is produced by means of a steel-faced die driven home by a sliding weight raised by ropes and pulleys and allowed to fall on the die. The patentees claim that a block comprising eight slabs, 24 in. x 24 in. x 2½ in. can be turned out in about twenty minutes.

The General Electric Company have sent us a small catalogue describing their various types of electric radiators. The issue of this catalogue is a timely one, as nearly all electric supply companies will now supply electric current at greatly reduced rates for heating and cooking purposes. Although at first sight the cost of the current used by these radiators seems prohibitive, yet when we take into consideration the saving of labour effected by their use, and that they do no harm to decoration, etc., they may often be economically employed. Each radiator lamp consumes about a halfpenny-worth of energy per hour, assuming that the energy can be obtained at 3d. per unit, and as four lamps will heat a moderately-sized room, it will be seen that it compares favourably with heating by gas, and is peculiarly suitable for libraries as it does no harm to the bindings of books.

The General Electric Company also sends us leaflets describing various novelties. The "Robertson Witelite" lamp has apparently been designed to meet the competition caused by the introduction of Nernst lamps. A high efficiency lamp is enclosed in a large spherical bulb, which is made of frosted glass underneath but the top part of the bulb is of clear glass, and the light leaving the lamp in the upward direction is reflected downwards by an opal shade. The general effect produced by this lamp is good. They also show a cheap automatic time switch which should prove valuable in flats and hotels. By its use the current can be switched off any circuit at a given hour. Other leaflets describe new and improved forms of Leclanché batteries for telephone, bell and fire alarm indicator work.

The Hozier Engineering Co., of Glasgow, send us their preliminary catalogue for 1905 of "Argyll" motor-cars, ranging in price from 700, down to 450. So far as we can judge from the illustrations and specifications here published, these cars are of good design in every sense of the term, an opinion which is confirmed by the facsimile reproduction of a reliability certificate awarded to the makers by the Scottish Automobile Club, for a non-stop run between Glasgow and London in May last. We are quite in sympathy with the announcement made that it is the constant aim of the firm to simplify the mechanism and eliminate every point liable to failure or apt to be troublesome. The popularity of motor vehicles generally would be much increased by greater attention to such matters, and, we need scarcely say, by further reduction in the cost of production.

Messrs. John Whitehead & Co., of Preston, send us their new catalogue No. 126 of brick, tile, pipe, and clay-working machinery. The catalogue is a volume of convenient size containing 100 pages and a large number of

illustrations. About one-third of the book is devoted to the description of multiple-process machines from combined pugging and brick-making machines with an output of about 6,000 bricks daily to combination plants with capacities up to 40,000 bricks a day. The pages following illustrate cutting tables of different types, brick and tile pressing machines, and various accessories. Next, we find descriptions of single and double action brick, pipe, and tile machines, apparatus for specially large pipes, and pipe socketing machines. The remainder of the catalogue deals chiefly with crushing, grinding, pugging, and moulding plant. The whole of the apparatus described appears to be well designed and of thoroughly substantial construction, as might be expected of a firm that has occupied a prominent position in connexion with the brick-making industry for more than half a century.

Messrs. G. Philip & Son send us a catalogue of their series of atlases; atlas for general reader; atlas for yachtmen; for students of astronomy; for motorists; for teachers and students; etc.

Messrs. J. E. King & Co. have sent us their new catalogue of the well-known "Mack" patent slabs and hollow blocks. These are made of gypsum, and reeds are embedded in the mass to render them lighter and more resistant to sound. The catalogue shows in detail the various uses to which the slabs and blocks can be put in floors, ceilings, partitions, wall-linings, etc., and for encasing steel joists, stanchions, etc. Summaries of tests to which the slabs have been submitted in London, Berlin, Boston, and Chicago, are given on pages 10 and 11.

The British Steel Corner, Plate Co. have sent us a sheet containing a description and illustrations of their galvanised steel corner-plate for the protection of plastered angles in buildings. It is designed to take the place of wood beads or cement angles, and is fixed by means of clips nailed into the joints of the brickwork.

From Messrs. J. H. Sankey & Son we have received a new catalogue consisting of three sections, formerly issued in three separate catalogues. The first is entitled "Bricks, Cements, etc.," and includes illustrations and prices of plain and moulded facings, paving bricks, glazed bricks, glazed tiles, roofing tiles and ridges, slates, etc. Section II describes fireclay goods of various kinds, including plain and special bricks, boiler seatings, hollow bricks for partitions, etc. The third section contains a fairly comprehensive list of drain-pipes, gullies, interceptors, and other sanitary ware. The catalogue is fully priced, and will prove useful to buyers of what are termed stock goods.

Mr. Thomas Potterton (Balham) has sent us his new catalogue of apparatus for hot-water supply. This is rather more than an ordinary trade catalogue, as it contains a good deal of information of general interest and utility on the subject of domestic hot-water services. The special object of the catalogue is to explain the advantages of the inventor's types of boilers for fixing at the back of kitchen fires. They are designed to obtain a greater proportion of heat than is obtained by boilers of ordinary shape, and are now shown in connection with the "Rex," "Regina," and "Competent" kitcheners, which have been specially made to receive the new types of boiler.

The Underfeed Stoker Co. send us their new catalogue, giving full descriptions of the various types of mechanical stokers made by them for internally-fired boilers and for all types of water-tube boilers. As the name of this apparatus implies, the fuel is introduced from below the level of the fire, and this end is attained by means of a fuel chamber under the grate, which is of special design and has a gap along the middle. The effect of feeding in this manner is to maintain a surface of incandescent fuel at the top, while exercising a maximum heating effect, is at the same time gradually heating the fresh fuel coming up from below and causing it to give up combustible gases. Thus it follows that the highest possible thermal efficiency and absolutely smokeless combustion should be secured, even with the most bituminous coals. How far these ends can be attained is a question that is to some extent answered by copies of reports printed at the end of the catalogue. We may add that mechanical draught is an essential part of this stoker system, and is supplied by fans driven from steam engines or electric motors, as may be most convenient.

Correspondence.

CANTERBURY TOWER.

SIR,—As public interest is aroused in the repair of the grand central tower of Canterbury Cathedral, the following extract from the fifth report (1876) of the Historical Art Commission on the documents belonging to the Dean and Chapter, may prove of interest to your readers.

"The central tower of Canterbury Cathedral, named, from an image which formerly surmounted it, the 'Angel Steeple,' was rebuilt at the end of the XVth century. The MS. (c. 245) records the outlay during nearly three years, extending from Easter, 1494, to Michaelmas, 1496. 1,163 quarters of lime were consumed, each quarter costing 8d., 1,132 tons of Caen stone purchased for 530*l.* 8*s.* 10*d.*, and 490,000 bricks were used, costing 3*s.* 4*d.* the thousand. The total expense for the whole period amounted to 1,035*l.* 1*s.* 3*d.*, in addition to which the monastery provided out of its stores lead, nails, ashlar, and ironwork."

In what are called the "Scrap books" in this collection of the Chapter are three volumes, which contain bills for work done and materials furnished or some memorandum of money paid out.

The report of these valuable records of the Dean and Chapter was drawn up by the late Dr. Sheppard, who gave much time to their better care and elucidation. The charters alone, dating from the VIIIth century to the reign of Elizabeth, are a historical feature, while the general range of subjects is very wide, touching on the monastic history of Christ Church and also on its relation to other distant foundations connected therewith.

It is most satisfactory that such a report was printed, thus assisting the antiquary and scholar, who cannot examine the original papers.

S. W. KERSHAW.

THE GUARDIANSHIP OF LONDON ANTIQUITIES.

SIR,—An interesting relic of London, viz., the dial stone which used formerly to occupy the centre of Seven Dials, has for many years occupied an ignominious position at the roadside of Weybridge Common, the column upon which it was originally placed having been converted into a memorial to the late Duchess of Kent.

Can nothing be done to rescue this memorial of London from where it now is, or, at any rate, have it placed on some other part of the Common? The wonder is that, after all these years, it has not been turned into road material by the local authorities.

I referred to it nearly two years ago in a paper read before the Architectural Association.

ANDREW OLIVER.

BRICKS FOR PAVING.

SIR,—I find that red bricks suitable for paving garden paths, made in my neighbourhood, cost about twice as much as good ordinary bricks, although they are only 2 in. thick instead of 3 in. It is true they have a smoother surface. This is necessary in order that they may be easily washed clean.

Should it not be possible to buy what I require—viz., a brick with a smooth surface on one side—at a more reasonable price? Perhaps one of your readers will be good enough to help me. The thickness of the bricks is immaterial.

CLAUDE JOHNSON.

GALLERY OF BRITISH ART, MILLBANK.—By the bequest of Mr. Henry Evans, of Derby, the picture, "Outward Bound," painted by Sir Edward J. Poynter, P.R.A., is added to the collection. Miss Tye has presented Chantrey's small sketch in burned clay of "A Nymph Reclining," and Mrs. Watts is the donor of a bronze portrait bust of the late G. F. Watts, by Mr. Alfred Gilbert.

TOWN HALL, MANSFIELD.—The Mansfield Corporation are asking for power in their Bill, which will shortly be before Parliament, to alter, enlarge, and improve their town hall and other adjoining properties, or to pull down the existing buildings and erect a new town hall, market hall, corn exchange, post-office, arcade, shops, offices, and any public or municipal buildings, and furnish and equip the same. They also seek borrowing powers to the extent of 40,000*l.* for new waterworks; 3,000*l.* for the purchase of land and erection of a museum; and for the town hall, etc., such sum as the Local Government Board may determine.

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE-STEEL.

INTRODUCTORY NOTE.

IN a recent series of articles* we dealt with the distinctive characteristics of concrete-steel, discussing the principles underlying construction in this material and stating rules for its application to the design of the chief members required in structural work.

Since the publication of the articles to which we refer, a widespread interest with regard to the subject has been manifested among architects, and we believe there is a general desire for further information. Having considered sufficiently, although by no means exhaustively, the main points necessary for the guidance of the designer, we now propose to deal with the practical side of the question by describing and illustrating the details of some typical buildings and other structures in concrete-steel. Our hope is that the records thus presented may be of practical service to those who are already convinced of the merits possessed by concrete-steel, and, further, that they may have the effect of arousing the interest of those who have not yet realised its peculiar suitability as a material of construction, or who have not been convinced of the ease with which it can be applied to structural work of almost every kind.

The First Concrete-Steel Building in Chicago.

It is very frequently stated, and especially by Americans, that Great Britain is the most backward among civilised nations to adopt new things. Sweeping assertions of the kind are seldom of universal application, and are frequently made by persons who mistake reasonable caution for undue timidity or culpable indifference, but it may be admitted that with respect to reinforced concrete construction we are considerably behind other countries. Those who throw stones, however, are not entirely free from blame, for we find that Chicago, which claims to be one of the most progressive cities in the United States, has made tardy recognition of concrete-steel as a material of construction. Steel cage and skeleton buildings have retained their position, and, until quite recently, the use of concrete-steel has extended to nothing more than floor construction.

The first indication of a change is marked by the erection of the building which is illustrated in this article, but it will be observed that the employment of concrete-steel is limited to the interior, as the outer walls are of brick masonry built in the ordinary manner. In accordance with the practice general in the United States, the main features of the buildings were designed by an architect, and the purely structural work was executed from the drawings and under the superintendence of a civil engineer.

The building, occupying a site measuring 100 ft. by 130 ft. deep, with frontages on Michigan-avenue and 13th-street, was intended for use as a warehouse, having been designed for seven stories, of which four have been finished and occupied, leaving the other three to be added as tenants offer themselves.

Fig. 1 includes a part sectional elevation through the outer wall, girders, and columns, an elevation of one series of columns, and cross sections of two girders and a column. The height of the ground floor is 10 ft. 6 in. above the basement floor, the height of the first story 15 ft. and of the other two stories 12 ft., measured in each case from floor to floor, the clear height being 1 ft. 6 in. less, with the exception of the second story, in which it is 1 ft. 7 in. less.

All the concrete-steel work, including column bases, columns, girders, joists, and floor slabs, is monolithic, being formed of Portland cement concrete, reinforced by round bars of mild steel, with an elastic limit of 36,000 lb. per square inch, these bars being of different sizes according to requirements.

We may here mention that the columns are spaced 15 ft. 6 in. apart, in rows running from front to back of the building, the rows being at a distance of 20 ft. one from another, measurements being taken from centre to centre in each case.

The column bases rest upon a layer of fine

sand, which is permeated with water and lies above a stratum of blue clay. The bases are proportioned so as to keep the load down to 4,000 lb. per square foot. Fig. 2 shows the details of a typical column base, the area in this instance being 11 ft. by 11 ft., but in some cases the dimensions are slightly less. No vertical bars or stirrups are employed for resisting shear, but the downward thrust of the column is distributed over the concrete by means of a horizontal plate of metal (see section in Fig. 2).

In constructing the footings, a 4-in. layer of concrete was first formed, the proportions being 1 part of Portland cement, 2 parts of sand, and 3 parts of limestone crushed so as to pass through a 1½ in. diam. ring. Four ½-in. steel bars were then placed side by side near and parallel to each edge of the concrete slab, over these two sets of seven 1-in. bars spaced 6 in. apart were laid diagonally from corner to corner of the slab, and finally two sets of seven ¾-in. bars were laid near the centre and parallel to the edges of the slab (see plan in Fig. 2). All the bars were connected by means of two strands of 18 B.W.G. wire, so as to keep the bars in their correct positions. Concrete was then poured upon and around the bars to form a layer 5 in. thick. The bars were shaken to permit the material to settle properly, and the concrete was thoroughly tamped. The concrete used in this layer was mixed in the proportions of 1 part of Portland cement, 2½ parts of sand, and 2½ parts of gravel passed through a ½ in. diam. ring. A third layer of 1:2:3 concrete was then deposited so as to complete the footing to the dimensions and shape shown by the section in Fig. 2. The parabolic curve in the same section represents the diagram of bending moments for the footing, and this diagram determined the height of the upper layer of concrete, upon which a ¾-in. steel plate, 24 in. square, was placed to receive the four vertical bars of the column reinforcement.

The footings of the outside walls and the party wall of the building are of concrete reinforced by longitudinal and transverse bars, varying in diameter from ½ in. to 1 in., and spaced from 4 in. to 9 in. apart, according to the loads to be carried. These bars are placed near the under-surface of the footing, at a distance equal to about one-sixth of the thickness of the concrete.

Although the columns are continuous from the bottom to the top of the building, the vertical bars of the reinforcement extend only from floor to floor, the joints, which are 6 in. above the floor level in each case, being made by means of a loosely-fitting sleeve of iron pipe, into which the ends of two bars were inserted, and the annular space between the bars and the sleeve was filled with cement grout. For the purpose of insuring the satisfactory bearing of one bar upon another, the end surfaces of the bars were carefully squared.

By the vertical and transverse column sections in Fig. 1 it will be seen that the reinforcement consists of four vertical bars connected at intervals by ½ in. diam. bands crossed with wires. The addition of these wires has the effect of assisting the round bands to resist outward pressure. Although the transverse reinforcement is probably not more effective than it would be if made of flat bars, it had the advantage of permitting the designer to place the vertical bars slightly nearer the exterior surface of the concrete than is possible when the verticals are threaded through holes drilled or punched in flat bars.

The vertical bars in the ground-floor columns are 2 in. diam., the bars for the columns above being reduced in diameter, as indicated in the vertical section in Fig. 1, in accordance with the diminution of load. Throughout the columns the concrete consists of 1 part of Portland cement, 2 parts of sand, and 2 parts of gravel passed through a ½-in. ring.

In building up the columns, the reinforcement was first erected and the moulds were then set up, clamped, and carefully plumbed and squared with the building. Details of a column mould will be seen in Figs. 3 and 5. The moulds consisted of square boxes of 1½-in. pine boards screwed together with 2-in. by 6-in. cleats, and bound at intervals by 2-in. by 4-in. clamps bolted at the corners, the ends of the clamps being wired as shown by the lower drawing in Fig. 3, representing a section on A—A in Fig. 5. The clamps were made rather larger than shown in the drawing, and were fixed outside the cleats

* The Builder, vol. LXXV.

so that wedges could be driven between the clamps and the cleats.

The moulds were constructed so that they could be lengthened or shortened to suit the heights of the different stories of the building (see Fig. 5).

The upper drawing in Fig. 3 is a cross section of the mould at B-B in Fig. 5, and shows the arrangement for the connexion of longitudinal and transverse girders. Bracket reinforcement, consisting of four $\frac{3}{4}$ -in. bent bars, was placed at the capitals of the columns (see Fig. 1), for connexion with the lower reinforcement of the girders, as well as to provide for resisting vertical shear.

The next step was to set up the girder moulds in accordance with the arrangement represented in Figs. 4 and 5, but it should be observed that the pouring of concrete into the column moulds was performed before the girder and floor slab reinforcement had been laid. The greatest care was taken to insure the penetration of concrete to all parts of the mould by stirring and tamping down the material between the bars.

Fig. 6 shows details of the reinforcement in one of the main girders, and it will be seen that the bars form the kind of truss usually adopted in the Hennebique system. The tension reinforcement consists of three 1-in. bars and the compression reinforcement of three $\frac{3}{4}$ -in. bars. There are also three bent bars of 1 in. diam. A novel feature of the reinforcement in this example is that the three bars in each truss are connected by means of electrically-welded network, 4-in. by 6-in. mesh, one net enveloping each set of reinforcing bars for one-third

of the span at each end. The three separate sets of reinforcement are similarly connected by means of another net extending over the centre third of the span. The object of the network is to afford resistance to the effects of shearing stresses in the girder. The nets are bent over and wired to the compression bars, thus preventing these from buckling in an upward direction under heavy load. All the reinforcing bars are bent at the ends for a length varying from 1 in. to 3 in. to the form of a right angle, so as to increase adhesion between the concrete and the steel.

In every case the girder reinforcement was assembled and tied together on the ground level, being afterwards hoisted and placed in the moulds. To keep the lower bars from touching the bottom of the mould, the reinforcement was hung from small trestle frames provided at intervals along each span, and, to preserve the predetermined lateral spacing, sets of wedges were placed between the three trusses, each formed by one set of the reinforcing bars. The trestles mentioned were afterwards used as supports for plank gangways required for the purpose of wheeling and dumping concrete to form the floor slabs.

The girder forms shown in Figs. 4 and 5 were connected at each end and the column moulds, where they received additional support from 2-in. by 6-in. timber struts (see Fig. 5), and were supported further by three 4-in. by 6-in. timber posts placed on wedges at floor level and diagonally braced with 1-in. by 6-in. boards, as indicated in Fig. 5.

As soon as the girder moulds had been fixed in position the floor centring was erected.

This was made in four parts for each panel, as shown in Fig. 4, to facilitate handling. The floor surface of the moulds consisted of boards simply nailed one alongside the other, but it would certainly be a better plan to employ matched boarding for the purpose. Owing to the weight of the floor, estimated at about 75 lb. per square foot, it was considered necessary to apply an adjustable centre support below each floor panel, as indicated by dotted lines in Fig. 4.

After the girder moulds and floor centring had been prepared, the reinforcing bars were distributed to different points of the floor, and were laid by a gang of labourers on marks previously made on the bottom of the floor centring. Two lathers followed the labourers to wire the bars together. All bars in the outer rows—that is, those next to the girders—were tied at every intersection in each direction, and the next three rows were tied at every third intersection. The bars in the middle of the panel were simply laid along the marked lines. All the floor bars were wedged up about 1 in. by means of stones. Finally, a series of bars termed "negation rods" was laid across the upper reinforcement of the girder and tied down to the floor rods on each side. These bars were designed to resist negative moments arising from continuous girder action, and causing tension in the upper parts of the floor slab near the supports. They were also intended to prevent the upper reinforcement of the girders from buckling in an upward direction under excessive strain. All the bars of the girder and floor reinforcement which ended at the outer walls of the building were bent

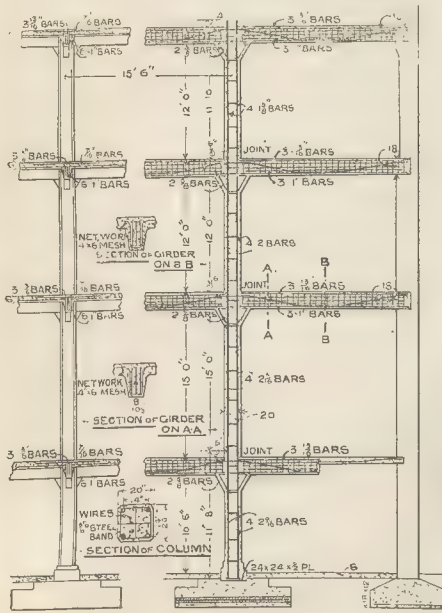


FIG. 1

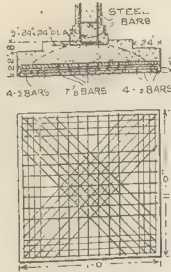


FIG. 2

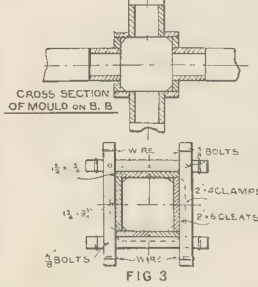


FIG. 3



FIG. 4

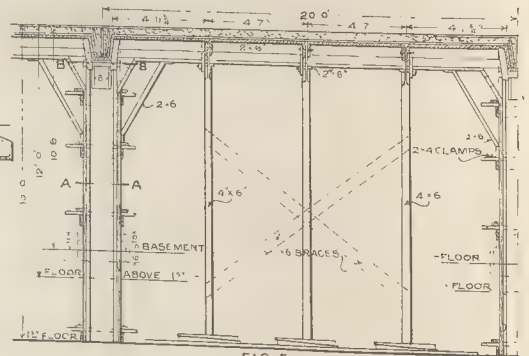


FIG. 5

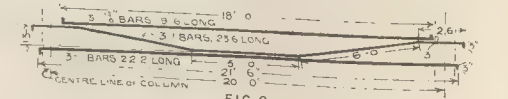


FIG. 6

Illustrations to Student's Column.

GENERAL BUILDING NEWS.

PONTRELAS COURT, HEREFORDSHIRE.—This residence has been remodelled; the old drainage system has been entirely removed and replaced by a system carried out upon the best modern principles. The question of sewage disposal has received careful consideration by the architects, the septic treatment being finally decided upon as being the best in this case; the necessary septic tank and filter beds have been laid down at a considerable distance from the residence. The whole of the sanitary fittings have been replaced and brought up to date. The water supply has been augmented, a new reservoir having been built and the water conveyed therefrom to the residence by means of galvanised water tubes. A complete installation of acetylene gas has been laid down, the generator used being supplied by Messrs. Thorn & Hoddle. The heating of the residence has been carried out by means of radiators, the heating medium adopted being low-pressure hot water. The sanitary work, water supply, heating, and general work have been carried out by Messrs. Beavan & Hodges, of Hereford, and the decorations and acetylene gas installation by Mr. J. C. M. Vaughan, of Hereford; the whole being according to the drawings and specifications and under the supervision of Messrs. Groome & Betington, architects, Hereford.

ABERDEEN BUILDING TRADE.—The building trade in Aberdeen during the past year has not been brisk, and the estimated value of the plans passed by the Town Council shows a falling off of nearly one-third from the value of those passed the previous year. The period under review has been remarkable in respect that the completion of several important building undertakings is now within view. The extensive operations at Marischal College will be finished before another year is past, Regent Bridge is practically finished, and the new post-office is far advanced so far as actual building work is concerned. In succession to these, the only contracts of magnitude which have been settled recently are those for the new theatre and for Sunnybank School, which should provide work for a large staff of men for a considerable time. When the general trade of the city and the country generally is as it has been lately, so important a branch of industry as the building trade is one of the first to be affected, and herein, no doubt, is the explanation of the dullness experienced.—*Aberdeen Gazette.*

EDINBURGH BUILDING TRADE.—Prominent builders in the city state that for dullness in trade the year has not had a parallel for a considerable time. It is rather curious to note that this view does not coincide with the building statistics of the Edinburgh Dean of Guild Court, the returns of which show more building warrants than the previous year. For the number of idle men, therefore, other causes must be looked for. In the first place, it must be once admitted that only about 60 per cent. of the work included in last year's return is in operation, and, compared with ten years ago, the statistics bear out that a similar condition prevailed at that time. It would, therefore, seem to indicate that the working population in this trade is vastly in excess of what normal conditions would warrant. This is particularly the case as regards unskilled labour. In no other trade in the town has there been such an outcry about the number of idle men than in the building trade. It must also be borne in mind that there is no industry which employs a greater number of unskilled labourers, and these are, as a rule, not of the provident class. For the year ended, the total warrants granted number 832. These include sixty-seven tenements, seventy-one villas, 212 self-contained houses, 123 public and other buildings, and 583 alterations. In these tenements there were twenty-five shops, forty-eight houses of one apartment, 207 of two apartments, 396 of three apartments, 189 of four apartments, fifty-four of five apartments, two of six apartments, and one of seven apartments; representing a total number of 897 tenement houses—the year's work representing an approximate value of £25,584, thus showing an

increase in favour of this year to the extent of 152,291.—*Scotman.*

GLASGOW BUILDING TRADE IN 1904.—The prediction made at this time last year that 1904 would be "a period of quietness" in the building trade throughout the city has been, unfortunately, amply borne out by results. Interviewing several of the principal builders and others interested in property, a Glasgow *Evening News* representative ascertained that the building industry generally has been suffering for the last two years through the natural depression in trade. Public works, it was pointed out, have no inducement to make additions at present, and the building trade—being so much bound up with every manufacturing industry—had been affected by the dull times experienced by the latter. At present there must be a considerable number of men unemployed—a state of matters that may continue until February or March, by which time builders are in hopes that trade may brighten up. Notwithstanding the dullness of trade, wages generally in the building industry have fallen very little, and compare (it was added) very favourably with those of any operatives—skilled or unskilled. At first sight the statistics furnished by the Dean of Guild for his year ending in September were highly satisfactory, but, as was pointed out by Lord Inverclyde when retiring from the chair, there had really been a considerable decrease in building operations in Glasgow—exceptional causes keeping up the total valuations. The total number of linings granted was 540, of which eighty-three were for houses and shops, compared with 170 for the previous year, and 197 for the year before. There was a very marked falling-off in the applications for linings throughout the city, both in regard to houses with a small number of apartments, and houses with six apartments and upward. The decreased valuation in that respect, compared with the previous year, was no less than nearly 800,000. That falling-off, however, had been met in the increase in valuations of linings applied for in connexion with public buildings, warehouses, workshops, and alterations and additions to existing buildings, while a few special linings for works of large value had made up for the decrease in other directions. The building of house property, it was further stated, has been brought to a complete standstill from the fact that already the supply is a long way ahead of the demand. The number of unlet houses—particularly for the working and middle classes—is greater than it has been at any time for the last ten years.

LEITH BUILDING TRADE.—The building trade in Leith during the past year has been anything but brisk, the total value of buildings for which warrants were granted by the Dean of Guild Court being only 173,700, as compared with 268,500 during 1903, a decrease of 88,800. Had it not been for the new poorhouse to be erected by Leith Parish Council at Seafield, the value of buildings passed by the Court would have been considerably less than half that of the previous year. The new poorhouse is estimated to cost about 60,000, and will, it is expected, take about three years to complete. Contracts have already been accepted for the boundary walls and roads, work in connexion with which is now being proceeded with. Altogether, fifty-six warrants were granted by the Dean of Guild Court during the year, as compared with fifty-eight during 1903. In addition to these, forty-one minor warrants were granted for work of an unimportant nature. Plans for thirty-two tenements were passed during the year. Of these, ten were of the two-roomed type, eleven of the three-roomed type, and eleven of the four and five roomed type, and they will provide accommodation for 315 families. These tenements are proposed to be built at Iona-street, Sloan-street, Albion-road, Jamieson-place, Darnell-road, Trinity-road, Craighall-crescent, Main-street, and Pitt-street; and a large block with fine shops underneath is also being erected by Sword at the corner of Great Junction-street and King-street. Warrants were granted during the year for sixty-two villas, chiefly of the flat and semi-detached type.

THE BUILDING TRADE IN MANCHESTER.—The head of a large firm in Manchester pronounced the past year to have been one of the worst that he had known in the building trade for over thirty years. There had been less ordinary competitive building in the city of Manchester and the district round about than, he thought, had obtained for a generation. "Railway companies," he said, "are doing practically nothing." There has not been any estimating for railway work in the district during the last fifteen months. The London and North-Western Railway Company, which has generally been doing

for about 2 in. at the end to afford satisfactory anchorage, and the girders were carried from one-half to two-thirds of the thickness of the brickwork into the wall.

Having prepared the reinforcement in the manner described, the floor girders and floor slabs were cast. All the concrete for the portion of the work was in the proportions of 1 part of Portland cement, 2½ parts of sand, and 2½ parts of washed pebbles. For the girders, a very wet mixture was adopted, and the material was thoroughly stirred and shaken after pouring, so as to prevent the formation of voids. For the floor slabs, a somewhat dryer mixture was used, permitting the slabs to be tamped. As the concreting proceeded the stones wedged below the reinforcing bars were removed.

After being tamped, the surface was levelled off with a straight edge, and the floor, covering the whole area of the building at each story, presented the appearance of a single monolithic slab broken only by the projection of the vertical reinforcement of the columns, these bars protruding about 6 in. above the surface. The floor slab was treated as a beam fixed at each end, the formulae used being:—

For the outer panels

$$M = w l^2 \div 12 \quad \dots \dots (1)$$

For the inner panels

$$M = w l^2 \div 24 \quad \dots \dots (2)$$

Where

M = Bending moment.

w = Dead and live load in lbs. per sq. ft.

l = Span in feet.

Formula (1) gives the maximum bending moment, which occurs at the ends of an *encastré* beam, and formula (2) gives the bending moment which occurs at the centre of a similar beam.

Reference to Art. XVII., vol. lxxxv., will show that these formulae practically agree with the treatment there recommended, except that nothing has been allowed for the arching effect due to a uniformly distributed load. The absence of such allowance, however, increases the strength of the floor at a merely nominal cost, and thus adds to the factor of safety.

The thickness (d) of the floor slab, in this case 6 in., was calculated by the rule

$$d = \sqrt{M \div 1,000} \quad \dots \dots (3)$$

and the area in square inches of steel reinforcement in each direction of the bars per foot width of the slab was determined by the rule

$$a = 0.075 d \quad \dots \dots (4)$$

In using rule (3), the bending moment as calculated by formula (1) should be taken, and the floor slab made of the maximum thickness so ascertained. In the building under consideration, all the floors, except that over the third story, are 6 in. thick, and by formula (4) the area of reinforcement per foot width in each direction would be

$$a = 0.075 \times 6 = 0.45 \text{ sq. in.}$$

and the total area of steel in the two directions would be

$$a + a = 0.45 + 0.45 = 0.9 \text{ sq. in.}$$

Thus, the proportion of steel to concrete is $\frac{1}{11}$ per cent. of the sectional area of the floor slab.

The first story of this building was let and occupied by tenants before the fourth floor was finished, and on completion of the building no sag or deflection was observed in any of the girders or floor slabs.

All the concrete was mixed in a machine with a capacity of 75 cubic yds. daily, but the quantity laid only amounted to an average of about 64 cubic yds. a day. Ten days were allowed for the concrete to set, and on the expiration of that period the moulds were removed. The architectural features of the building were designed by Mr. J. Gamble Rogers, as architect, and the engineering details by Mr. E. Lee Heidenreich, as consulting engineer.

W. E. HENLEY MEMORIAL.—The Dean and Chapter of St. Paul's, having given a site in the Cathedral for the proposed monument in memory of the late Mr. William Ernest Henley, the committee, of which Lord Windsor is chairman, have accepted an offer made by M. Auguste Rodin to design a sculptured setting for his bust of Mr. Henley, which will be executed in bronze.

something in the locality, has not had a set of quantities drawn out hereabout for a whole year, and the same may be said of the Great Northern and the Midland Companies. The Lancashire and Yorkshire Railway Company have been enlarging Victoria Station, but that has been the limit of their building work. During the past fifteen months the railway companies have closed their pockets, and issued orders that there shall be no work done except that which was absolutely necessary. The Government, likewise, has been spending scarcely any money in Lancashire, except upon one or two small post-offices. Such public works as have been carried on in this part of the county have been chiefly school buildings for various education committees. These do not swell the ordinary volume of the building trade very much. In Manchester new buildings are always being raised. A large warehouse for Messrs. Joshua Hoyle & Sons in Piccadilly, the new premises of Farr's Banking Company in Spring-gardens and York-street, the Scottish Amicable Insurance Company's offices in Cross-street, offices in Brown-street, and warehouses in Dale-street, are a few examples of those which have been completed or nearly completed during the year, but the number of contracts of the kind has been much below the average. There have been some works in the neighbourhood of the Ship Canal, but the sum total throughout the locality has not been satisfactory. More men are out of employment in the building trade than, I think, I have ever known. There has, however, been no attempt on the part of the employers of labour in the district to reduce the rate of wages. We have kept up the maximum rate of pay although there have been inducements towards reduction. Many establishments are working short time, and at least one large firm in Manchester is employing scarcely half the number of men who have formed its complement in any of the past thirty years." The building trade in Liverpool, it was added, was fairly brisk. The building trade was always the last to be affected by depression. In like manner it was the last to be benefited by the return of good times. He anticipated that good times were coming now that the cotton industry was busy. When the cotton trade was making plenty of money there were plenty of building requirements. More inquiries were being made as to the value of land and buildings, and so far as Manchester was concerned this was very desirable, for he did not think there had ever before been so many valuable pieces of land and so much new property unoccupied in the city as had been the case recently. Bad trade for builders acted upon architects, and he was afraid that the architects of Manchester had suffered very considerably during the past from lack of commissions.—*Manchester Courier*.

BUILDING IN NEWCASTLE.—Each year that goes over leaves behind it an appreciable advance in the architectural and structural improvement of Newcastle. There has been particularly no more remarkable than it has been during the year that is just closing. It has not been an organised scheme of building, such as that which ennobled and beautified the town in the time of Dobson and Grainger, but has been the result of the independent enterprise and skill of owners, architects, and builders. There is hardly a business thoroughfare in Newcastle where the evidences of change and improvement are not apparent, in stately buildings, rearing their roofs above their neighbours. Land is still increasing in value. Sites are, unhappily, not elastic, and so the unassuming brick buildings that were sufficient for a past generation are being replaced by tall erections of many stories, in modest imitation of the sky-scrapers of America. The buildings of Mr. Dobson's time were sovereign in their simplicity, as became, then, their association with commerce; but, since then, art has spread everywhere, and its influence is apparent in brick and stone.—*Newcastle Chronicle*.

THE BUILDING TRADE IN OLDHAM.—Glancing back at the building trade during the past year, the most active seems to have been displayed amongst what may be termed semi-public bodies—namely, churches and chapels, the latter particularly. Of course, we are not taking mills and Corporation work into account. Speculative builders, however, have been very busy during the splendid year, in splendid as far as weather goes—and they in consequence have tended to bring together the undeveloped portions of the skirting territory, and be it said that they have always found a ready market for their properties, which have mostly been of the cottage class. To sum up, on almost all sides during the year has been

seen the handiwork of the man who builds not to order, but in order that he may sell or let. Churches and chapels have, as above stated, been active in rebuilding and alterations, and the outlook for the coming year is as hopeful as at the beginning of 1904. The officials of the building trade report a general slackness within the past month or two, but that that is a better outlook at present.—*Oldham Standard*.

BUILDING TRADE IN SHEFFIELD.—The year just ended has been characterised by depression in most of the great industries of the Kingdom, and Sheffield has not been an exception. Reports have shown that hundreds of men have been altogether without employment, or have been engaged only a portion of the week. But official statistics show that in Sheffield, at any rate, the building trade has not suffered so severely from the unsatisfactory condition of business as have many other branches of industry. In 1903 the plans deposited with the City Surveyor for buildings of various kinds numbered 1,296, and for the twelve months just ended they reached 1,194. In 1903 the houses shown on the approved plans were 2,358, and other buildings 420, while during the past year the houses have numbered 2,324, and other buildings 757. The houses shown on the approved plans for the year up to December 21 were 1,916, against 2,051. Although, therefore, there is a falling off in numbers, the decrease is very slight. Of the public buildings which have been completed or on which progress has been made during the year, the most important is the new University in Western Bank. The work of erection has been considerably advanced, and in a few months a portion of the large block of buildings will be occupied. Mr. Green, the chief building inspector, and his staff have had to deal with no fewer than 219 "dangerous properties" during the year. Thirty-one drainage schemes have been approved, and amongst the plans submitted were no fewer than thirty-seven for "sheds," most of them no doubt for storing motors and cycles.—*Sheffield Telegraph*.

PROPOSED NEW LIGHTHOUSE NEAR SUAKIN.—An official announcement has appeared inviting tenders on behalf of the Egyptian Ports and Lights Administration for the erection of a lighthouse on the Sanganeh Reef, near Suakin, on the Red Sea. Tenders will be received up to May 1, 1905, and meanwhile all communications on the subject should be addressed to the Deputy-Controller-General, Ports and Lights Administration, Alexandria. The following general description of the requirements is given:—Open ironwork tower; height of focal line, 165 ft. above high water; light of first order, showing all round, with red danger sector of approximately 140 deg. in lantern; petroleum-burning type of lamp; group flashing; recommended to be built upon screw piles driven into the coral; quarters required for four light-keepers, to be constructed in the framework of lighthouse; kitchen, messroom, office, storerooms, etc.; isolated storeroom in part of the building connected by a bridge with lighthouse; fresh water tanks and hand pumps, etc.; copper speaking tube to lantern from bottom of lighthouse, also gongs in men's quarters for communication from lantern; masonry caisson under lighthouse at least 6 ft. above high water, protected by a parapet 3 ft. high and 3 ft. thick; internal diameter of caisson to be at least 20 ft. more than outer piles; this caisson to be used for promenade for men, storage of tanks, landing stores, etc. Wooden pier to edge of reef on iron piles will be required for landing stores, etc. The light-keepers' dwellings are to be constructed of wood, chemically treated as a precaution against fire, and care is to be taken to render both dwellings and lantern cool and well ventilated, the climate being very hot. The lighthouse, when completed, must be capable of resisting a wind pressure of at least 55 lbs. per sq. ft., 167 kilos per sq. metre, a small concrete platform already exists on the reef which, although not strong enough for use as a foundation, will assist in landing material, etc. Detailed drawings must be submitted with tenders; prior to be quoted for light-house, erected on the reef, complete in all details and ready for use; materials to be of the very best quality, subject to the approval of the Administration's experts, who will have the power to reject any bad material or workmanship. The reef lies about thirteen miles to the eastward of Sheikh-el Barghut harbour, which place affords very good anchorage. The lighthouse is required to be built in the southern portion of the reef, which is accessible in nearly all weathers.

MASONIC BUILDINGS, NORWICH.—It is proposed to erect new masonic buildings on the site of the Masonic Club, 47, St. Giles'-street, Norwich. Recently the Managing Committee

invited a number of local architects to submit plans for the building, and in the competition Mr. Albert C. Havers, of Norwich and Sheringham, was successful. The rooms for the club members will all be arranged on the ground floor. The rooms for the different lodges and chapters will be placed on the first floor, being approached by a staircase from the entrance hall. The kitchen, scullery, and domestic offices will be on the second floor, the approach being by secondary or service staircases from the back hall adjoining the staircase hall. The service bedrooms and linen store are to be on the top floor in close proximity to the kitchen and domestic offices, but on a higher level. The club-rooms on the ground floor will be approached from the street through an entrance lobby, fitted with folding doors, the following accommodation being provided:—Entrance hall, reading or smoke room, with ingle nook, boardroom, with fireproof strongroom for the members' books and papers, billiard-room for two tables, cardroom, refreshment buffet, etc., lavatories, and sitting-room for steward and stewards, with private door opening into entrance lobby. The lodge and chapter-rooms on the first floor will be approached from the entry hall by a lighted staircase. The following accommodation is to be provided:—Landing, robing-room, with lavatories adjoining, and a temple designed in the Ionic order with six columns on each side and two at each end. These will be carried out in fibrous plaster. The length of the building is 35 ft., width 22 ft. 6 in., and height 18 ft. The walls are to be ornamented, and the walls, columns, and ceiling surfaces are for the present intended to be finished white. A chamber for an organ will also be provided. Adjoining will be the banqueting hall and a serving-room. The kitchen and domestic rooms will be on the second floor. The entrance is intended to be carried out in Monk's Park stone, with parts in Portland stone, the entrance being centrally situated.

MANCHESTER MEDICAL VOLUNTEERS' HEAD-QUARTERS.—The new headquarters of the Manchester companies of the Royal Army Medical Corps (Volunteers) are situated at the corner of Upper Chorlton-road and Darnley-street, and, with the outdoor drill-grounds, cover a space of a little over four acres. Built of red stock brick and Rainhill stone, the administrative portion of the headquarters is dominated by two towers. A principal part of the building is a circular central hall. Around this, on the ground floor, are the caretaker's apartments, the commanding officer's room, orderly-room, adjutant's room, stores and office for the quartermaster, the men's canteen, and other offices. On the second floor is placed the officers' mess, which includes a dining-room, ante-room, billiard-room, the sergeants' mess, and a large kitchen. In this part of the building there is also provided a lecture-room, and another room which can be used for demonstrations. The lecture-room will accommodate from 300 to 350 men. In the upper story is a room for the band, a gymnasium, and seven bedrooms and storerooms. The drill hall is 160 ft. long by 76 ft. 6 in. wide, exclusive of a platform and balcony, 15 ft. deep at one end of it. In addition there is a large outside drill-ground. Around two sides of the outside of the drill-shed are placed nine waggon-houses. The buildings have been designed by Mr. T. H. Cunliffe, architect, and built by Messrs. Neill & Son.

HOSPITAL EXTENSION, BRIGHTON.—The new out-patients' department at the Royal Alexandra Hospital for Sick Children in Dyke-road, is situated to the rear of the main building, with which it will be connected by a covered corridor. The new department is being built by Messrs. Lynn, Brighton, to the plans of Mr. T. Laisson, architect, also of Brighton. The front of the building is of red brick and rough-cast, with stone dressings, timbered above, and a tiled roof. The new long and 20 ft. wide, with separate plastering above a glazed brick dado, the flooring throughout being of mosaic. The walls have been decorated with a series of tile panels in colours illustrative of nursery tales. Communicating doors give admission to the consulting-room and dispensary, at the end of which is a corridor leading to a smaller waiting-room. Here the patients receive their medicine and pass out by a separate exit. This section of the block is the one already finished and in use. It has the usual office appointments. The remaining portion of the block, still in the hands of the builder, consists of a receiving-room for accident cases,

casual ward, surgery, and darkroom, etc., on the ground floor, and three isolation wards, nurses' room, kitchen, bathroom, etc., on the first floor. The staircase leading to the isolation ward is of concrete and has a separate entrance from the hospital, the flooring is fireproof, and scarpie plastering has been used for the walls. The internal angles are rounded throughout the block. The cost amounts to about 5,000.

KNUTSFORD PUBLIC LIBRARY.—A new library has been erected at Knutsford, from the designs of Mr. Alfred Darbyshire. The building is of brick and grey terra-cotta. The principal feature is a reading-room, which is 22 ft. by 33 ft. At the end of the reading-room are two alcoves where books and magazines may be taken and read. In the library there is shelving accommodation for 10,000 volumes. Rooms are provided for the librarian and for other purposes.

BUILDING IN YORK.—From the following figures it will be seen that the building trade has diminished considerably in York. In 1903 there were 238 plans for dwelling-houses approved during the year as against 194 last year. Of the above dwelling-houses the number completed during 1903 was 328, and sixty-four last year; the total number of dwelling-houses in progress in 1903 was 161 and now seventy-three; number of dwelling-houses completed during last year, but approved prior to December 31, 1903, 179. In addition to the above 134 plans have been approved for additions and alterations to premises in various parts of the city, and the greater part of these have been carried out. The work of replacing the pinnacles and flying buttresses on the north side of the nave of York Minster has been commenced by preparing the stone in the Minster work-yard. These operations were really undertaken by the Dean and Chapter so that the full staff of workmen should be employed during the whole of the winter. When the scaffolding has been erected in order to perform the work of fixing the pinnacles and buttresses, it is proposed to thoroughly examine the clerestory windows and restore the mullions which are now somewhat dilapidated. It is hoped that eventually the flying buttress of the south side will be replaced. The erection of the scaffolding on the south-west tower was finished on February 20, 1903, the top pinnacles completed on November 18, 1904, and the uppermost portion of the scaffolding removed exactly a month later. It is anticipated that the whole of the scaffolding will be taken off the tower some time during 1905, and then the restoration of the gable over the great west window will be commenced.—*Yorkshire Herald.*

STAINED GLASS AND DECORATION.

KING'S SCHOOL, CANTERBURY.—In memory of the Rev. Herbert Waddington, a former pupil (1838-47), and a benefactor of the school, a new pulpit has been placed in the choir transept of Canterbury Cathedral, which was the school chapel. The pulpit is of fumed oak, carved after designs by Mr. W. D. Caroe, Architect to the Cathedral.

MEMORIAL FONT, UPPERY CHURCH.—A new memorial font was placed last week in Uppery Church (Cumberland). It is of local red stone, octagonal on plan, and in late Decorated style. The eight sides of the bowl have quatrefoil panels in the centre of the alternate panels is a shield. Upon the eastern shield is the monogram, "I.H.S.," and on the north and south sides the shields carry the Greek letters Alpha and Omega respectively. The western shield contains a brass plate with the following inscription:—"To the glory of God and as a memorial of the ministry of the Rev. Henry Lonsdale, M.A., Hon. Canon of Carlisle and Rural Dean, Vicar of this Parish, 1889-1904. This font was erected, December, 1904."

APPOINTMENTS.

OXFORD.—The election is announced of Mr. C. J. Holmes, one of the editors of the *Burlington Magazine*, to the Slade Professorship of Fine Art, Oxford University.

DULWICH COLLEGE.—In succession to his father, the late Mr. James F. Field, who had held the appointment during a long period, the firm of Messrs. Field & Sons, of Chancery-lane and Borough High-street, Southwark, surveyors and estate agents, has been elected as an Estate Governor of Dulwich College.

FARADAY SOCIETY.—The council of the

Faraday Society have nominated as their President Lord Kelvin, *vice* Sir Joseph Swan, who retired from that office at the close of last year.

SANITARY AND ENGINEERING NEWS.

WATERWORKS, BOLTON.—By their Bill, which will come before Parliament in the forthcoming session, the Bolton Corporation seek to construct new waterworks in Bolton, Turton, and Darwen, the engineer's estimate for which is 752,000.

SEWAGE WORKS, ACTON.—The Acton Sewage Bill, which will come before Parliament shortly, authorises the Urban District Council to construct sewage and outfall works, and to make further provision for the admission of sewage into the Metropolitan main drainage system for a portion of the district. The estimate of the engineers for the works is 51,000.

BRIDGE, BRISTOL.—The engineer's estimate in connexion with works comprised in the Bristol Corporation Bill has been lodged in the Private Bill Office. For removing and rebuilding the bridge which now carries the Feeder-road over Nethen Lock, with the approaches, the estimate is 30,000.

RAILWAY BRIDGE, SHEFFIELD.—The old wrought-iron bridge, near Attercliffe-road station, on the Midland Railway, has recently been replaced by one of greater strength and modern design. The new structure has been carried out under the supervision of Mr. John Brunton (the company's resident engineer), from plans prepared by Mr. J. A. Macdonald. The contractors for the steel were Messrs. Butterley & Co., of Derby; and Messrs. Charles Baker & Sons, Sheffield, contracted for the steel work.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—Mr. W. WOUNACOTT, architect and surveyor, has removed from Berkeley House, Berkeley-square, to 113, Piccadilly, W.

BITTERNE, SOUTHAMPTON.—An historical spot, near the mouth of the river Itchen, is about to be returned to its pristine uses as a military station, having been acquired by the War Office for the erection of new barracks and the establishment of a military depot for reservists and time-expired men. Bitterne Manor-house, near Northern bridge, stands on the site. In part, of Clausentum, which formed a chief naval and military station during the Roman occupation of Great Britain. The outer ditch and masonry, with looped walls, of the Roman fortress, and other remains of the camp, may still be traced, and large quantities of coins of the 1st-IVth centuries, implements, pavements, etc., have been frequently dug up. To Clausentum succeeded the Anglo-Saxon town, Hantune, where Canute sometimes resided.

THE VINERY, HAMPTON COURT PALACE.—By the King's command the vinery is in course of reconstruction upon an enlarged site. The vine was originally planted in the Privy Garden in 1763, being a slip from the Black Hamburgh vine at Vauxhall, near Ilford, which had been planted there ten years previously by Sir Charles Raymond, who then owned the estate. The Palace vine has a stem 115 ft. long, with a greatest girth of nearly 46 in. The removal of the paving stones from the floor of the old grape-house will, it is expected, result in benefit to the roots, and the tree is to be surrounded with a glass enclosure in order to protect it from dust and other accidental injury on the admission of visitors.

GRANITE IN ELBA.—In the annual report of Mr. Vice-Consul Tonietta to the Foreign Office the following passage occurs:—"The granite quarries on the southern coast of the island are worked on a large scale. A load of slabs expressly prepared for pavements or other work on roads has been forwarded to the Transvaal, and there are also large orders from London, Bombay, Calcutta, Madras, Cape Town, and Durban. The granite is not scarce, but hitherto nothing has been done to provide for the dispatch of such great quantities, which need rapid and safe means of transport which is very difficult to obtain in the places where the quarries are situated, because the coast offers no shelter against the south-easterly and south-westerly winds, or against the unexpected rush of wind and sea that frequently comes from the Straits of Bonifacio."

DECORATIVE TRADES' EXHIBITION, EDINBURGH.—In connexion with the annual general meeting of the National Association of Master Painters in Scotland, which is to be held early in March, it has been decided to hold an exhibition of the decorative trades in the Waverley Market, Prince's-street, to be open

from Wednesday, March 8, to Saturday, March 11. The exhibits will, include wall papers and other wall and ceiling coverings; paints, varnishes, and enamels; textile fabrics and carpets; gas and electric fittings; metal and wood work; grates, marbles, tiles, and mosaic; modelled plaster; caron pierre, and every kind of decorative material.

PATENT OFFICE LIBRARY.—The authorities have just issued a bibliographical guide to works relating to the Fine and Graphic Arts, including photography, and art industries, in the library. The volume is compiled in the form of a "subject list," with its several headings based upon the contents, rather than the titles which, in many instances, are deficient or misleading, of the books as primarily catalogued. The list of subjects comprises building construction and materials, bricks and tiles, surveying and instruments, and ornament, iconology, ornamental alphabets, furniture, built-work and marquetry, cabinet-making, art education, art metal-binding, artistic anatomy, archaeology, and biographies of artists. The numerous annotations and cross-references furnish full particulars of the methods adopted for classifying and grouping the books concerned, and inform the reader where he will readily find them in the library.

PARISH CHURCH, CARISBROOKE, I.W.—Mr. Thackeray Turner has made his report upon the fabric in respect of which a restoration fund will be opened. He states that the church is a structure of great beauty, with a fine Perpendicular tower, which is strong and sound, though the bells should be rung, since ringing of them as now hung sets up strain and vibration, which is beginning to produce cracks in the masonry. The building, he says, is in sound state, the west wall of the porch excepted. Mr. Thackeray Turner recommends certain repairs and improvements, with the opening out of the tower arch and the west window by the removal of the organ and choir stalls to the east end. He is averse from the opening of the chancel arch and the building of a new chancel, as has been proposed by way of a memorial to the late Prince Henry of Battenberg, Governor of the Isle of Wight. The former chancel was pulled down to save the cost of its repair. Mr. Thackeray Turner points out that a new chancel would disfigure the church, and would be of but little use, since the chancel arch could not be more than 9 ft. 8 in. in the clear, and to alter it would be out of the question.

LICENSED VICTUALLERS' PREMISES AND THE NEW ACT.—Mr. James Green, whom the Local Government Board nominated as arbitrator, has issued his "initial valuation" award concerning the licensed property which it is alleged will be improved by the proposed widening of the south extremity of Hampton Court road where it meets Euston and Tottenham Court roads. Mr. Green computes the value, as land and premises of the Duke of Grafton public-house, at 36,375*l.*, and the site as commercial land at 5,000*l.*, or with the licence, at 17,250*l.*; the corresponding values for the Adam and Eve public-house he estimates at 51,875*l.*, 13,200*l.*, and 41,250*l.* respectively. The latter tavern, we may mention, is the successor of that which is depicted in Hogarth's "March of the Guards to Finchley" (1745), now in the Foundling Hospital.

THE IRON AND STEEL INDUSTRY.—Messrs. Matheson & Grant's Engineering Trades' Report states that after a time of doubt and depression, the New Year opens with many indications of reviving trade. The prices of pig-iron recorded in their report a year ago remained, with slight variations, till the middle of the year, but during the last few months there has been a decided rise, and contracts for future delivery point by their conditions to the expectation of a further advance. The makers of finished iron and steel, who regard pig-iron as their raw material, are struggling with adversity in their endeavour to obtain corresponding prices for their products. There are already signs favourable to their hopes. In the North of England, the improving prospects of the shipbuilders render probable an increased demand for material of all kinds, and therefore higher prices. In regard to steel rails, the present power of production is greatly in excess of present requirements. In the United States, the demand would for years to come equal the present supply, but there is always a tendency to increase production. In maturely the power of production of the Grand Trunk Railway will call for large supplies during the next few years, and the Canadian

makers will be supported by tariffs, supplemented, if need be, by bounties, to keep the trade in the Dominion. The anxiety there to supply all the wheat required by Great Britain, does not go so far as to take rails and other staple products of this country in exchange. In regard to structural steelwork, the railway companies are all restricting their expenditure on renewals and extensions, but the work on bridges and stations that cannot be postponed has afforded a fair amount of employment during the past year. The use of steel in buildings is growing, but the designers endeavour, in the use of beams and sections, to leave a minimum of work after the steel is rolled. Great improvements have been made in the works carrying on this branch of engineering, not only in the use of the best labour-saving machinery, but in the sequence of operations and such systematising of departments and designs as will prevent the numerous leakages that absorb profits. An increased output capacity from works of a given area is also to be obtained. Partly from these causes their capacity is at present in excess of the employment available, and anyone who believes in a coming revival of trade could, at the present time, obtain control of well-equipped works much below cost price.

IMPROVEMENTS AT BROMLEY.—Under their Bill, which will shortly be before Parliament, the local authority of Bromley contemplate making by-laws with regard to buildings, etc., and they ask that all new taverns, hotels, boarding-houses, and schools, where the building exceeds 35 ft. in height, shall be provided with means of escape from the upper stories in case of fire. A number of street widenings, etc., are scheduled, for which the engineer's estimate is £7,322.

BRIDGES, LITTLEHAMPTON.—The Urban District Council of Littlehampton are asking Parliament this session for power to purchase the ferry rights over the river Arun at Littlehampton, and to construct a bridge over that river. The engineer's estimate of the cost is 14,000.

Legal.

CASES UNDER THE LONDON BUILDING ACT, 1894.

At the North London Police Court, on December 23, before Mr. E. Snow Fordham, Messrs. T. S. Elkington & Sons, of Roman-road, Bow, were summoned by Mr. W. G. Perkins, District Surveyor for West Hackney, for fixing a new shop-front at No. 514, Kingsland-road, without first serving a notice in writing, pursuant to the provisions of section 145 of the London Building Act, 1894.

The defendant contended that the work was one of necessary repair, and that they were in consequence exempted by the provisions of section 209 from giving notice.

The District Surveyor proved that the work consisted of a new shop-front, new stall-board, and a new fascia to the cornice, having a greater projection than the old fascia, and that what had been done was more in the nature of an alteration in the shop-front to suit the purposes of a new tenant than a repair, and, in referring to sections 138, 145, 146, 73 (3 and 4) and 207, pointed out that stall-boards were frequently placed upon the public way, and unless proper notice was given, the District Surveyor was deprived of the opportunity of seeing the provisions of the Act complied with.

The magistrate held that the work was one for which notice should have been given, and fined the defendants 10s., with 12s. 6d. costs.

Messrs. Kearns & Stevens, of 581, Green-lanes, Harringway, were also summoned at the same time for putting in new shop-fronts to No. 68, Kingsland High-street, without giving notice, and were fined 20s., with 12s. 6d. costs.

THE NATIONAL SOCIETY AND THE BUILDING ACT.

At Westminster, under the London Building Act, 1894, Mr. Francis was called upon to adjudicate and to make an order with respect to a site in Great Peter-street, Westminster, the National Society, as building owners, being dissatisfied with the decision of Mr. Drury, District Surveyor, with respect to certain work which he had ordered. Counsel for the National Society said that, under a charter of George III., they assisted in promoting the education of children of the poor in the principles of the Established Church. It was proposed to build more commodious premises in Great Peter-street, in

lieu of those in Broad Sanctuary, and it was claimed that they carried on a retail business in the sale of educational works; this branch only represented about 30 per cent. of their turnover, and was altogether subsidiary to their office and counting-house work. Accordingly, they claimed exemption from the restriction which applied to domestic buildings. Mr. T. D. Dutton, for the District Surveyor, said that, though this was a perfectly friendly reference, the plans were misleading, as they indicated large shop space on the ground floor and basement. Mr. Drury, the Surveyor, was bound to give the notices, otherwise he would have really been responsible for any accident. Mr. Francis, after examining the plans, held that the building came within the exemption of the Building Act.—*The Times*.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any communication to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

26,425 of 1903.—N. S. ARTHUR: *Machine for Bending and Straightening Angle Irons, Tee Irons, Channel Irons, Rails, and other Metal Bars and Beams.*

A bending or straightening machine, characterized by three rollers, one of which is fixed in position, whilst the other two are capable of being moved through an arc of a circle in such manner as to bend the metal bar, rail, or beam round or upon the fixed roller, the said rollers being all arranged to revolve about their axes.

27,914 of 1903.—T. ROWDON: *Ventilating Gear for Greenhouses, and the like.*

Ventilating gear for greenhouses, and the like, consisting of a weight carried by a series of pivoted levers, one of which is curved and engages on a roller fixed to the outside of the ventilator, said weight being operated by a travelling bar and acting as a counterpoise when the ventilator is raised.

28,219 of 1903.—L. TAYLOR: *Kerbs, Fenders, and Fireplace Fittings.*

This invention relates to kerb fenders for fireplace fittings. The invention consists essentially in constructing kerbs or fenders with folding stops pivoted or otherwise attached thereto to fold inside or underneath the base, and preferably with a recess formed or cut in the base into which the stop may be folded to prevent injury thereto when packed up for transit.

411 of 1904.—J. B. BROOKS and D. ANSLOW: *Manufacture of T-Elbow and like Junction Fittings, for Pipes and Tubes.*

The manufacture or production of metallic T-junction fittings for pipes and tubes, which consists in first fashioning a roughly-formed blank of metal, when in a heated and soft state by drop stamping, or by dies and pressure, into a partly-formed fitting, then subsequently cross rolling up or gathering into a tubular form, the flattened or spread out metal part surmounting a tubular stem member, formed in the first stage of manufacture, and afterwards welding the joint.

1,138 of 1904.—A. T. HEYMANN: *Safety Device for Retaining Cabin and other Doors Ajar.*

A device for locking doors ajar, consisting in the combination with a retaining hook

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

joined to the door jamb, and adapted to engage with an eye on the door, of a locking plate joined to the retaining hook, and slotted so as to be capable of entering into the unlocking arrangement of the suitably shaped end of the door lock when said bolt is shot by means of the key.

1,633 of 1904.—H. MOORE: *Furniture Castors.*
A furniture castor, consisting in the combination of a divided socket made with an internal projection, and fixed to the castor plate, a vertical pivoted pin carrying the horn piece and castor bowl, and made with a groove with which the internal projection engages in such a way as to prevent the castor pin from falling out of the socket, but so as to allow the castor pin to turn freely and be withdrawn from the socket and re-inserted therein to bear against the top of the socket.

2,820 of 1904. F. L. AMES: *Fireproof Curtains for Theatres, and the like.*

This invention has reference to fireproof curtains, particularly adapted for use in theatres or similar structures. A fireproof blind or curtain, made in accordance with this invention, consists in knitting or weaving together fine metallic threads or wire with which may be incorporated some fireproof substance such as asbestos, or, if desired, two or more metallic threads composed of different metals may be woven or otherwise intermixed with one another. An important feature of this invention is that the threads of which the curtain is composed must be of that degree of fineness that they will be capable of being woven so closely that the said curtain when made will be air proof in construction.

2,838 of 1904.—F. L. AMES: *Dock Gates, Bridges, and similar Structures.*

This invention relates to dock gates, bridges, and similar structures. According to this invention an extensible hand-rail is provided which may be of telescopic, folding, or similar formation, so that when the dock gates are closed, said hand-rail can be readily extended across the same and will thus afford a support or guard for persons in crossing the gates. Or the said hand-rail may be flexible so as to be capable of rolling up at the ends of the dock gate when not required to be used. If necessary detachable or folding rights may be provided for supporting the said hand-rail at intervals and for imparting thereto extra rigidity.

3,928 of 1904.—W. MATTHESON & WILSONS & MATTHESON, LTD.: *Stoves, Fireplaces, or the like for Domestic or other Purposes.*

This invention relates to stoves, fireplaces, or the like for domestic and other purposes, and is particularly applicable to that class of stove, or the like, which is provided with a movable canopy for the purpose of regulating the size of the opening into the flue, or the like. In carrying out this invention, the canopy is of the usual construction, but in place of the handle or a finger or projection of suitable dimensions is attached on the interior of such canopy, by means of a screw or other convenient means, such finger projecting some little distance towards the fire back. The plates forming the sides of the stove, grate, or the like, are constructed as hitherto, with the exception that the top edges of said plates towards the front of the grate are so formed that the interior movable plate or head may be loosely pivoted thereon.

4,820 of 1904.—E. G. HARCOURT: *Flanlight and similar Opening and Closing Devices.*

Flanlight and similar opening and closing devices of the self-sustaining type, the combination comprising an arm or its equivalent, and means for reciprocating the same, mounted upon a support secured to the fixed framing, a socket piece in pivotal or rotatable connection with the said arm, and a bar or stem piece projecting from the flanlight or movable part and adapted to slide within the said socket piece.

4,900 of 1904.—C. J. SIMONS: *Roofing Tiles.*
Roofing tiles having at one side a grooved rib projecting upwards above the face of the tile, and at the other or opposite side a covering flange having on its underface a downwardly or inwardly projecting tongue, the arrangement being such that, in laying the tiles, the covering flanges lie over the said grooved ribs, and the tongues of the covering flanges loosely take into the grooves of the ribs.

7,071 of 1904.—R. L. LOCKERIE: *Means for Hanging Sashes.*

A telescoping roller, consisting of a hollow spindle, a supporting bearing for one end thereof, two circular flanges thereon forming

COMPETITIONS AND CONTRACTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered
*Sketch Plans for Four Artisans' Cottages	Wembley U.D.C.	3s. 3s.	Feb. 8
*Designs and Plans for New Public Elementary School	C.B. of Preston	50l., 30l., and 20l.	Feb. 28
*Designs for Municipal Buildings	Borough of Lambeth		Mar. 30

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Lighting Dudley Hill Council Schools by Electricity	Bradford Education Committee	W. Bailey, Tonfield-buildings, Market-street, Bradford	Jan. 9
Dining Room at the Belle Vue Schools	do.	Education Office (Architect's Department), Manor-road, Bradford	do.
Paving Carriageway of Richard-st., with Jarrah Blks.	Finsbury Borough Council	Boro' Surveyor's Office, Finsbury Town Hall, Rosebery-av., E.C.	do.
Lantern Lights at Public Baths, Parkshot	Richmond Corporation	J. H. Brierley, Borough Surveyor, Town Hall, Richmond, Surrey	do.
Two Observation Boats at Sunatorium, Helton-road	Hull Corporation	J. H. Hirst, City Architect, Town Hall, Hull	do.
Repairs to Plaster, Walls, etc., Down Cathedral	do.	Col. B. H. Wallace, C.B., 45, Victoria-street, Belfast	do.
Street Works, Llanbadrach	Caeppilly U.D.C.	A. O. Harpur, Surveyor, Council Offices, Caeppilly	Jan. 10
Laundry Machinery	Kilmarley District Lunatic Asylum	L. F. Griffin, Medical Superintendent at the Asylum	do.
Rowley Bag and Blast Furnace Cinder	Perry Barr U.D.C.	H. H. Gammell, Sur., Council Hse., Green-ls., Hamstead, nr. D'ham	do.
Iron Pontoon for Seacombe Ferry Landing Stage	Wallasey U.D.C.	Ferries Manager's Office, Egremont Ferry, Cheshire	do.
Gas Burners at Ouseburn Council Schools, Albion-row	Newcastle-on-Tyne Education Com.	A. Goddard, Sec. Educa. Office, Northumberland-rd., Newcastle	do.
Materials, etc. (twelve months)	Lancaster Corporation	J. C. Mount, Borough Surveyor, Lancaster	do.
Cleaning Down, etc., Sheepscar, Runswick, etc. Libraries	Leeds Corporation	City Engineer's Office	Jan. 11
Oak Furniture for Woodhouse Branch Library	do.	do.	do.
Furniture and Fittings for Headingley, etc., Libraries	do.	do.	do.
Pillar Posts for Fencing, etc.	do.	do.	do.
Revolts and Strand Wire	Burma Railways Co.	A. G. Begbie, 76, Gresham House, Old Broad-street, E.C.	do.
Portland Cement	do.	do.	do.
5,000 tons of Portland Cement	do.	do.	do.
200 tons of Spalls	do.	do.	do.
Stones	Blackpool Highways Committee	J. S. Brodie, Borough Engineer, Town Hall, Blackpool	do.
Bridge Work	Woodwich Guardians	T. Cutler, Clerk, Union Offices, Woolwich	do.
Electric Lighting of Workhouse, Wigam-road	St. Indian Penitentiary Railway Co.	J. L. Berry, Secretary, 48, Croydon-avenue, London, E.	Jan. 12
Laundry for Headgins, Homes for Children, Fishponds	Burma Railways Co.	A. G. Begbie, 76, Gresham House, Old Broad-street, E.C.	do.
Four Dwellings at Clifton, Co. Galway	Ormskirk Guardians	G. R. Peers, Engineer, 16, John Dalton-street, Manchester	do.
4,000 yds. of 2-in. metal Pipes and Laying	Bristol Guardians	W. S. Skinner, Architect, Edgbury-chsra., Baldwin-st., Bristol	do.
100 yds. of 2-in. Fireclay Pipes and Laying	Commissioners of Irish Lights	O. Armstrong, Secretary, Irish Lights Office, Dublin	do.
Concrete Cisterns for Wa. Sup. to Easter Elchies Hse.	do.	do.	do.
100 to 200 tons of Soft Timber	Seaford Estates, Rothes	Estate Office, Rothes, N.B.	do.
National Schools, North William Street, Dublin	do.	do.	do.
Business Premises, South-street, Eldon	Chorlton & Manchester Wkshs. Com.	J. Macdonald, Poor Law Office, New Bridge-street, Manchester	Jan. 13
Christchurch Part Sewer (200 lineal yds.)	St. Vincent's Convent	A. B. Bruntz, C.E., 1, College-street, Dublin	Jan. 14
Sewer, Farinham-road, Guildford	Rev. U.D.C.	W. J. Lomax, Engineer, 11, Fold-street, Bolton	do.
Wimmerley-street Works	Guildford Town Council	C. G. Mason, Borough Surveyor, Tuns Gate, Guildford	Jan. 16
Alteration of Mossfield House, Springburn	Glasgow Corporation	Longdon, Public Works, City-chambers, Glasgow	do.
10,000 yds. super. of Street Paving with Setts	Londonberry Borough Council	W. J. Robinson, City Surveyor, Guildhall, Londonberry	do.
Rebuilding the Angel Inn, Neath	Mr. E. Evans Bevan	J. Cook Rees, Architect, Neath	do.
Widening the Shore-road, Dunoon	Mr. T. P. Williams	J. Andrew, Burgh Surveyor, Dunoon	do.
Baptist Chapel and School, Glyncroft, Port Talbot	Rav. J. Baker	D. L. Evans, Architect, Blaenavenny	do.
Sunday School, St. Catherine's, Canton, Cardiff	Revd. J. Baker	J. W. Rodger, 14, High-street, Cardiff	do.
Tramway Points and Crossings, etc.	Rochdale Corporation	S. S. Platt, Borough Surveyor, Town Hall, Rochdale	do.
*Valve House, etc., at Polehill Works	Coventry Corporation Gas Com.	Engineer and General Manager, Gas Works, Coventry	do.
*Making-up Edgware-road	Edinburgh District Lunacy Board	Council's Engineer, Council Offices, Hendon, N.W.	do.
Four Homes for Female Patients, Bangour	Glasgow Corporation	Hippolyte J. Blanc, Architect, 23, Rutland-square, Edinburgh	Jan. 17
Steel Superstructure, Orkney-road Bridge, Strindon	Edinburgh District Lunacy Board	Engineer, Fiddington Station	do.
Cast-Iron Water Tank for 60,000 gallons	Widnes U.D.C.	F. J. D. Westell, Clerk, 28, Bridge-street, Winesbury	do.
*Construction of Sewers, etc.	Willston District Council	Council's Engineer, Dyas-road, Kilburn, N.W.	do.
*New Boiler House, etc.	Chisleham Guardians	Clerk to the Guardians, 250, King's-road, Chelsea, S.W.	do.
Enlargement of Manor Park School	East Ham Education Committee	E. I. Curtis, Architect, 11 and 12, Finsbury-square, E.C.	do.
Roadworks, Naseby's Estate, Rugby	Rugby Benefit Building Society	J. T. Franklin, Architect, Regent-street, Rugby	Jan. 19
Steel Roadway Bridge over the Oak at Kemers	Monmouth C.C.	J. J. Webster, Engineer, 30, Victoria-street, Westminster, S.W.	do.
Stones	Birmingham Public Works Com.	J. Price, City Surveyor, Council House, Birmingham	Jan. 20
Road Material	do.	do.	do.
Carting Work	Elgin Town Council	A. A. Tarriff, Burgh Surveyor, Elgin	do.
Removal of Partition, etc., at Recent-fresh School	Plymouth Education Authority	E. C. Cook, Education Office, 18, Princess-square, Plymouth	do.
*Erection of Police Court, etc., at Lutworth	Leicestershire C.C.	S. Perkins Pick, 6, Milton-avenue, Leicester	do.
Reconstruction of Frook's Sewer, etc., Old Trafford	Manchester Corporation	City Surveyor's Office, Town Hall, Manchester	Jan. 23
Stores, Whitehead National School	Camberwell Borough Council	A. H. McKibbin, Whitehead, Belfast	do.
*Footbridge and Approach	Horsham R.D.C.	Borough Engineer, Town Hall, Camberwell	do.
*Sewerage and Sewage Disposal Scheme	Beckenham U.D.C.	Council's Surveyor, Council Offices, Beckenham	do.
*Roadmaking, etc.	London C.C.	Chief Engineer, County Hall, Spring Gardens, S.W.	Jan. 24
Roadwork and Plate-laying for Tramways	Swindon Corporation	General Section, Architect's Department, 16, Pall Mall East, S.W.	do.
*Public Elementary School, Sennab-street	Leicester Corporation	J. G. Griffin, Engineer, Electricity Works, Swindon	do.
Restoration of 17, Fleet-street	Derby No. 2 Building Club	Railway's Arms Hotel, Derby	do.
Lancashire Boiler, etc.	Edlington U.D.C.	G. Kenwick, F.S.I., 78, Colmore-row, Birmingham	Jan. 25
Steel Roofs for Engine, etc., Houses, Beaumont Leys	Lancashire Asylum Board	T. Wainwright, Clerk of Works, at the Asylum	do.
Thirty-two Houses at Derl	Lambeth Borough Council	Fisher & Milnes, 6, Rowcroft, Strand	Jan. 28
Council House and Library	Stroud R.D.C.	G. Kenwick, F.S.I., 78, Colmore-row, Birmingham	do.
Attendant's Messroom, etc., County Asylum, Kishill	Edlington U.D.C.	E. W. G. Drennan, at the School, Drax, near Selby	do.
*Annual Contracts	Harrogate Corporation	N. A. Smith, County Surveyor, Hatfield	do.
*Sewerage Works	Hertfordshire County Council	Union Offices, Bulcamp, Halesworth	do.
*Erection of Council House and Library	Rything Union	R. St. George, 17, Victoria-street, S.W.	do.
Electric Lighting, etc., Res. at Grammar School, Drax	Chertsey R.D.C.	P. W. Davies, Water Engineer, St. Peter's-square, Nottingham	Jan. 30
Granite and Slag	Lancashire and Yorkshire Riv. Co.	E. Knott, Secretary, Port Talbot	do.
*Fire Escape Staircase, etc.	Nottingham Water Committee	Davis & Soper, 84, St. Mary Axe, E.C.	Feb. 8
*Construction of Two Bridges	Port Talbot Railway and Docks Co.	do.	Feb. 18
Painting Works	Capetown Corporation	do.	No data
Re-survey, Wyford Bridge			
Hydraulic Coalpit, Port Talbot Docks			
*Granite Setts			

Those marked with an (*) are advertised in this number.

Competitions, iv.

Contracts, iv, vi, viii, x.

TERMS OF SUBSCRIPTION

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"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 12s. per annum (62 numbers, PREPAID). For parts of Europe, America, Australia, New Zealand, India, China, Ceylon, etc., 2s. per annum. Remittances (payable to MORGAN) should be addressed to the Publisher of "THE BUILDER," Catherine-street, W.C.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursdays. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest tender is under 100%, unless in some exceptional cases and for special reasons.]

† Denotes provisionally accented

* Denotes *accepted*. † Denotes *provisionally accepted*.

ABERMOREAIS.—For erecting head-teachers' rooms, for Merthyr Tydfil Urban District Council Education Committee. Mr. J. Llewellyn Smith, architect:—
E. P. Davies, 6, Broad-street, Dowlais £198

—For laying and jointing one mile
for the Tonbridge Rural District

Per Line		Per Line	
Yard.	S. d.	Yard.	S. d.
Carley	3 4	A. Sheeter & Co. 1	8
O. Jarvis	3 28	A. E. Nunn	1 7
H. Bingham	2 10	J. B. Bletts & Son 1	8
Penney & Son	2 4	J. R. Copp	1 4
Crates & Son	2 28	bridge	1 4
.....	1 98		
.....	14-in.		
	\$ 3-in.		

BRISTOL.—For pulling down old buildings and the
 mation of roads and sewers at the Horfield Commu-
 nism estate, for Mr. G. Humphreys, Carmarvon-road,
 Bristol. Mr. W. P. Saunders, architect and
 surveyor, Roper-church, Quay-street, Bristol. —
 Free & Co. £1,358 15 11 Merewether, Bristol. —
 Dares & Co. 1,799 0 0 & Sons .. £1,317 0 0
 and Hayter, 1,793 0 0 Wilkins &
 Taylor, 1,630 0 0 Quay-street, Bristol.
 & J. Bennett .. 1,395 0 0 Ashford-rd.* 1,300 0 0
 W. Brindson. 1,055 0 0
 M. Parker. 950 0 0

* With

ATH.—For the erection of shops on

Private house at Chadwell Heath, Essex.	Mr. Serberghs, architect, 3, Crooked-lane, Kilgill William-street, London, E.C.1.—		
Method Bros.	£1,235 0 0	Dowsing & ...	
W. Ashburn ...	£1,149 0 0	Davidson ...	£1,090 0 0
A. & A. Willmott ...	1,099 0 0	Clemons Bros. ...	1,060 10 0
CHELTENHAM. —For erecting four iron fire escape ladders at the workshope, for the Guardians' Hall, architect, 2, Essex-place, Cheltenham:—			
Hall & Son £235 0 0	J. Hitchen & ...		
Asquith Bros. ...	205 0 0	Son, Ltd. ...	£182 10 0
On Foundry ...		St. Pancras Iron ...	
C. Co. ...	202 0 0	W. C. ...	158 0 0
J. A. Baker & ...		G. Wright & Co. ...	163 0 0
C. Co., Ltd. ...	196 0 0	Boneford & ...	
C. Crosswell ...	173 10 6	Evershed ...	147 10 0
L. Letherton & ...		Cadogan Iron-works ...	145 10 0
... ..	168 0 0	... ..	142 0 0
Phillips & God ...		Hancock & ...	142 10 0
... ..	167 5 9	R. E. & C. ...	
Erring & Son ...	167 0 0	Marshall ...	140 0 0

for club-house, for the Chertsey Golf
 Club, architect, 118. Haver, Dulce.

Gray	.....	£270	J. Harris, Lisleham	.....	£520
Playney	.....	700	A. Jordan	.....	518
‡ With reservations.					
COLERAINE.—For building a technical school, and the Urban District Council. Messrs. W. & M. Given, Architects, Diamond, Coleraine.....					
W. Gould & Co., Coleraine	.....	£1,481 9 3			
EDMONTON.—For the erection of a new Section House at Edmonton. Mr. Dixon, architect, Surveyor General, Edmonton. Messrs. Thurgood, Son, & Chidgey, Astrakhan-croft-chambers, Duke-street, Adelphi, W.C.					
Hood	.....	£4,200	A. Monk	.....	2,460
Waylay Brothers	.....	3,829	Willmott & Sons	.....	3,640
Ames	.....	3,600	W. & A. G. Smith	.....	3,600
Harper & Son	.....	3,795	Higgs & Hill	.....	3,688
.....	.....	3,748	Fairhead & Son	.....	3,288
Evre	.....	3,720	Lawrence & Son	.....	3,278
Scellies & Co.	.....	3,720	Knight & Son	.....	3,278
.....	.....	1,935	.....	.....	.....

Rem. laying '60 ft. dia. of sewers.

ANDREW WOOD, Engineer, Union District Council. Mr. H. Richardson, Engineer and Surveyor, Council House, Handsforth.

Mr. Wood, Union-row, Handsworth. * £430 18 6

HENDON.—For portable fire escape shed, for the London District Council. Mr. S. Slater, Grimley.

Mr. Slater, Engineer and Surveyor.

Hess, Ltd. £198 0 A. E. Brown? .. £108 6 6

Huddell, 137 0 Turle Bros. 104 0 0

Lisles, 181 10 F. Smith & Co. 97 0 0

Impress, Ltd. 116 0 Pearce .. 96 0 0

..... 116 0 W. H. Peacock, .. 87 0 0

Glover & Sons 113 0 Marylebone .. 87 0 0

Harbrow 114 0

Patent construction "Frazzi", including foundations.

Recommended for acceptance.

RULL.—For work in connexion with the basement and shops facing Waterworks-street and Carr-lane (part of Public Hall), for the Property Committee of the Corporation. Mr. J. H. Hirst, City Architect, Town Hall, Hull. Quantities by City Architect:—
J. Sangwin £15,952 10 11 | T. Goates. £15,290 0 0
Bowman & Sons. 15,650 0 0 | Hobbie-
& Son. 15,460 0 0 | Wilson. 15,268 15 9
E. Good & Sons. 15,450 0 0 | G. H. Pan-
ton, An-
labry rd.,
F. Belby. 15,299 0 0 | Hull. 15,268 15 9

LONDON.—For repairs and decorations to five shops at Lower Clapton, N.E. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, London, E.C. 1.—
J. T. Robey. £282

LONDON.—For repairs and decorations to two shops at Lower Clapton, N.E. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, London, E.C. 1.—
A. W. Derby. £151

LONDON.—For alterations and interior fittings to 240, High-road, Lew. S.E., for the London & South Western Bank, Ltd. Mr. C. L. Morgan, architect, 43, Cannon-street, E.C., and 2, Station-chambers, Haslemere, Surrey. —
Lascelles & Co., £1,297 | General Builders, £1,087
Courtney & Fair-
bairn. 1,145 | J. Grover & Son. 1,007

LONDON.—For the erection of new Baptist Church, Shooters Hill-road, Blackheath. Mr. E. S. Dorrige, Albert-buildings, Queen Victoria-street, and Messrs. Thompson & Walford, Leadenhall-buildings, joint architects:—
P. & H. T. Higgs. £2,900 | W. Akers & Co. £5,163
Higgs & Hill. 6,444 | Holt & Sons. 6,160
Holliday & Green-
wood. 6,377 | J. & H. Roberts. 6,139
Kennard Bros. 6,352 | Batley, Son, &
J. C. Bowyer. 6,280 | Holmes. 5,987
J. & W. Falkner &
Sons. 6,210 | Putman & Fother-
ingham. 5,983
* Recommended for acceptance.

LONDON.—For roads and sewers, Golders Green, N.W. (first portion), for the Golders Green (Finchley-road) Estate, Limited. Mr. H. J. S. Abrams, surveyor:—
W. Neave & Son. £4,425 | E. Rogers & Co. £4,235
J. Mowlem & Co. Ltd. 4,405 | T. Adams. 4,114
S. Kavanagh & Co. 4,377 | R. Ballard, Ltd. 3,950

MARKET HARBOUROUGH.—For constructing sewerage works from Northampton-road to Farndon-road and Coventry-road, for the Urban District Council. Mr. H. G. Coates, Engineer, Council Offices, Northampton-road, Market Harborough. Quantities by Engineer:—
G. R. Hull. £1,224 4 7 | A. Palmer. £948 18 11
L. Angley. 1,000 | A. Christie. 925 18 11
H. R. G. & Co. 1,000 | E. & T. Smith. 924 17 5 1/2
Johnson. 1,109 8 4 | G. H. East-
wood. 904 12 11
Siddons & Freeman. 1,068 13 4 | E. Haycock & Sons. 879 2 4
H. H. Barry. 1,060 13 3 | A. Jewell,
Kirk & Dobson. 1,047 7 6 | Little Bow-
den. 849 5 0
B. R. & E. H. Philbrick. 1,047 1 0 | T. Pantler & Son. 806 7 2
J. Holme & Sons. 1,002 7 0
[Engineer's estimate, £905.]

NORBITON (Surrey).—For residence, stabling, etc., for Mr. Arthur Billings. Plans, specification, and quantities by Mr. W. G. Tutt, surveyor, 12, Ironmonger-lane, E.C. 1.—
T. Roberts & Co. £3,970 | Martin. £2,780
Penny & Co. 3,955 | Green & Co. 3,777
Jones. 3,890 | Baker. 3,690
Adams. 3,799 | Braid & Co. 3,672

B. NOWELL & Co.,

Stone Merchants & Contractors.
Chief Office.—**Warwick Road, KENNINGTON,**
Norway, Guernsey, and Leicestershire
Granite, Kerb, Pitching, and
Yorkshire Stone.

ESTIMATES GIVEN FOR EVERY DESCRIPTION OF
ROAD MAKING.

PETERHEAD (Scotland).—Accepted for erecting an Infectious Diseases Hospital, for the Town Council. Mr. T. H. Scott, Architect, Town House, Peterhead.—
Masons: W. Stuart & Son, St. Mary-street, Peterhead. £1,799 0 0
Carpenters: G. Scott & Son, St. Mary-street, Peterhead. 728 15 0
Plumber: J. Davidson, 34, Knoll-street, Peterhead. 448 18 0
Plasterer: A. Kelman, York-street, Peterhead. 277 15 0
Slater: J. Craig, 5, Windmill-street, Peterhead. 200 0 0
Painter and Glazier: W. G. Calder, 19, Queen-street, Peterhead. 308 6 8
The whole work will be completed £30 of the estimate, viz., £4,000.

PONTYPRIDD.—For alterations and additions to the Girls' and Infants' Departments of Coedpenmaen School, for the Pontypridd Urban District Council. Mr. P. R. A. Willoughby, Surveyor to Council:—
E. B. Smith Jones, Pontypridd. £1,344 10

REIGATE.—For street works in Blandford and Crakell-roads, for the Town Council. Mr. F. T. Clayton, Borough Surveyor, Municipal Buildings, Reigate:—
Cunningham-
Co. £1,049 0 0 | Forbes & Co. 2899 11 7
A. G. Soan. 1,032 10 0 | Fry Brothers. 892 2 8
J. G. Pickard. 972 2 8 | H. Streeter & Co. 810 0 0
E. Lies. 968 18 0 | S. Kavanagh & P. Thacker. 937 1 1
G. S. Faulkner. 919 15 0 | Co. Surbiton Hill. 755 0 0
J. May. 900 0 0

STAINES.—For sewerage Ruskin-road, for the Urban District Council. Mr. B. J. Barrett, Engineer and Surveyor, Town Hall, Staines:—
S. Kavanagh & Co. £240 7 | G. Wimpey & Co. £164 17
C. Mott & Sons. 212 16 | W. H. Angur, W. H. Wheeler. 208 17 | Staines. 158 10
[Surveyor's estimate, £163.]

WALSALL.—For repairs and maintenance of paving to playgrounds at schools, for the Education Committee. Mr. H. H. McConnell, architect, Bridge-street, Walsall:—
W. Shepherd, Rochdale, initial payment. £370 0 0
Annual payment for 12 years' maintenance. 79 17 4

WOKING.—For bungalow residence at St. John's, Woking, for Mr. Joseph Martyr. Mr. H. G. Gribble, architect, St. John's:—
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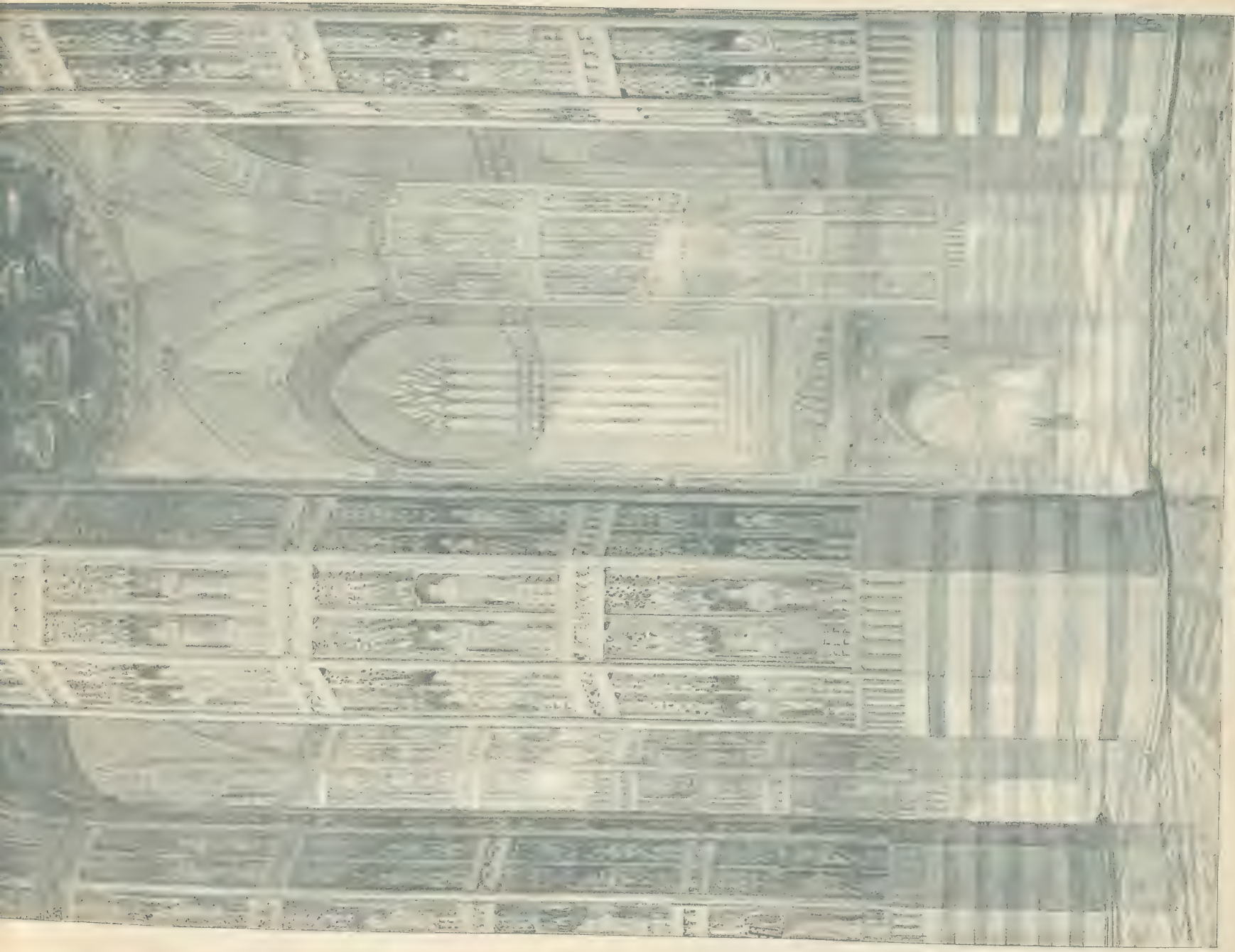
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LIVERPOOL CATHEDRAL. DESIGN BY MR. GILBERT SCOTT.
DRAWN BY MR. GILBERT SCOTT.



VIEW OF THE INTERIOR OF THE CHURCH OF ST. MARTIN, LONDON.
DESIGNED BY J. B. BAKER, ESQ. F.R.S.
ENGRAVED BY J. G. KNEELAND, ESQ. F.R.S.



PEACE DESIGN FOR THE DECORATION OF A LITTLE ROOM BY M. G. H. G. S. 1904

THE BUILDER, JANUARY 7 1900



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CARTOON OF SINGLE FIGURE FROM "PLACE" BY MR. G. HOWARD SHORT



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LOGGIA DE' LANZI, FLORENCE: FROM THE INTERIOR.—DRAWN BY MR. A. C. CONRADE





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KINGSTON BRIDGE--FROM A DRAWING BY MR. W. MONK



Whitehall Stairs (*Buckle* 1831).



Treasury Buildings, Whitehall, before Barry's alteration (*Higham* 1825)



Scotland Yard with part of the Banqueting House (*Sandby* 1766)

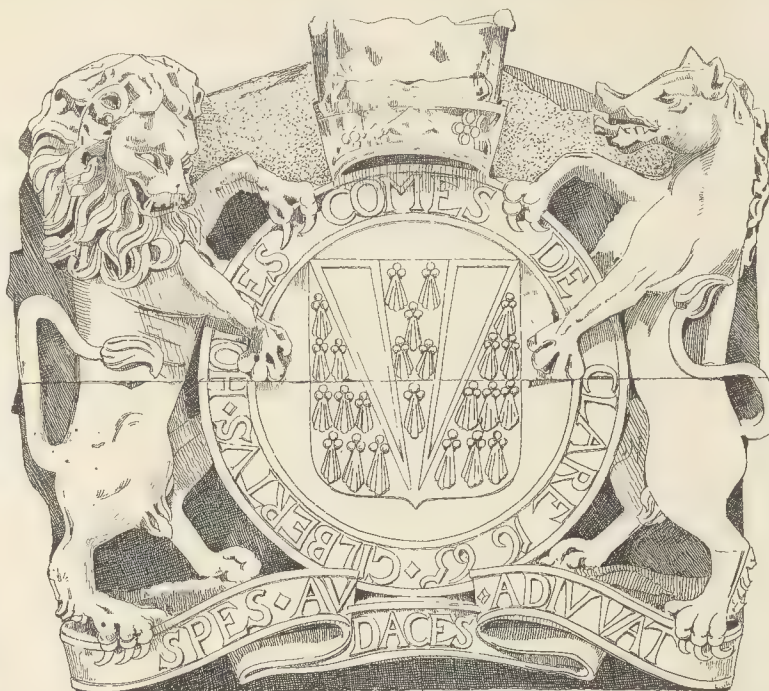


The Admiralty: shewing the Screen before alteration (*T. Malton* 1795)

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Panel with crest of the Skinkeys
from Crooked Lane.

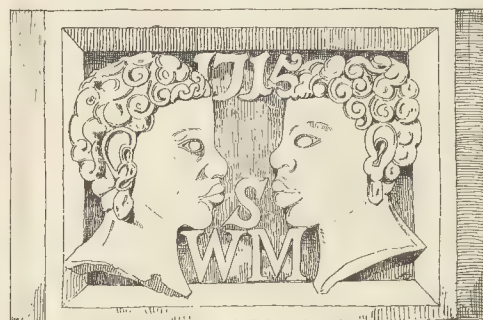


Panel with arms of the City of London
from No 342, Strand.



Heraldic Tablet formerly on the
front of the Old Bell Inn, Holborn.

Sculptured stone with the arms of Gilbert
Holles, Earl of Clare, from Holles Street,
Clare Market.

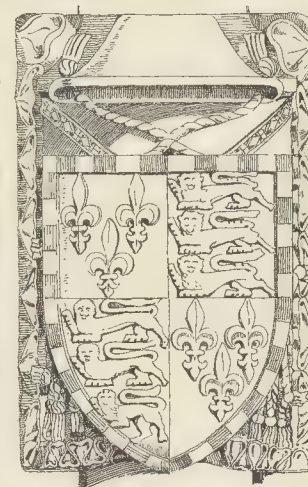


A Panel from Clare Market

Scale
of
inches



Arms of Cardinal Beaufort,
in St. Saviour's Ch., Southwark.

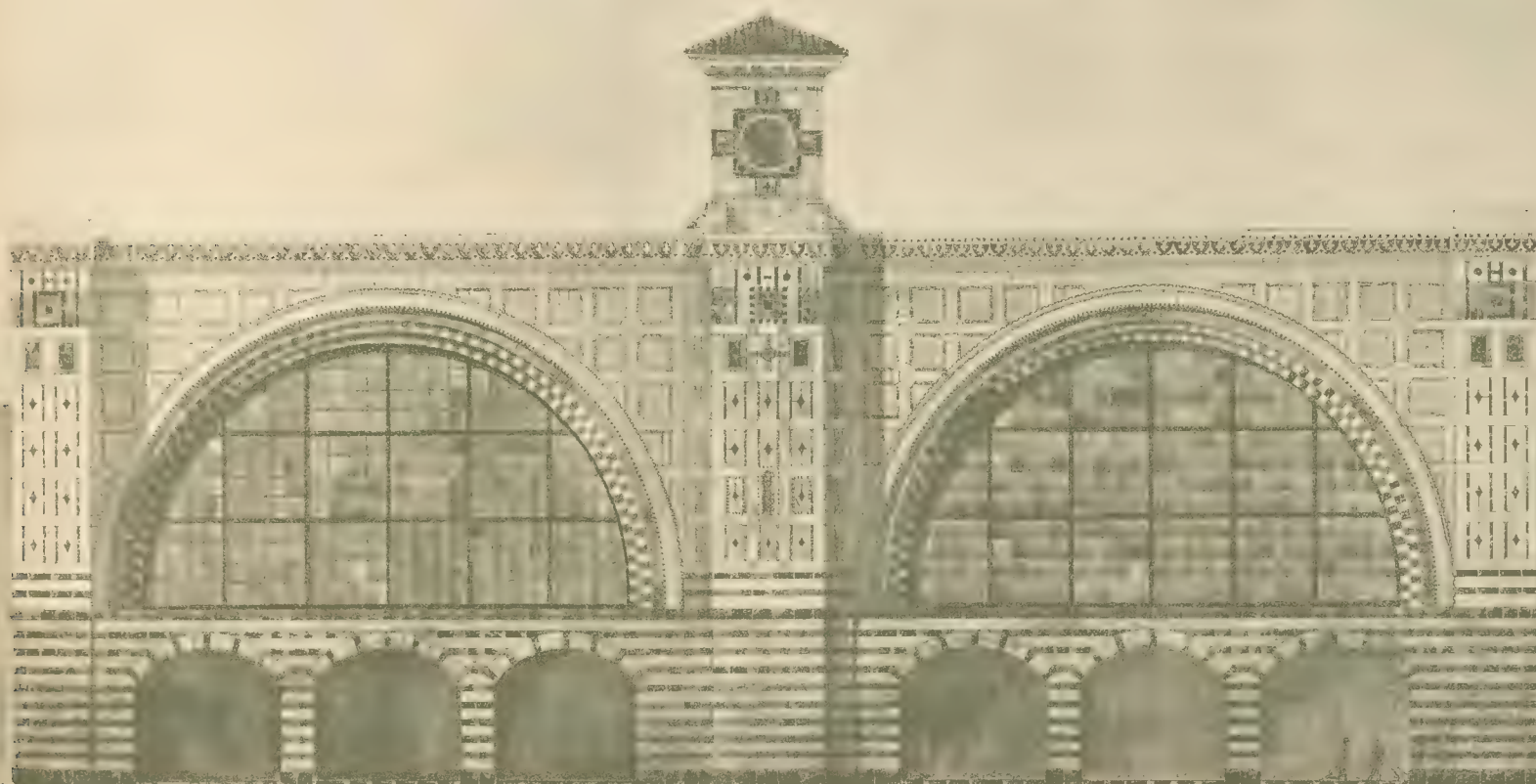


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THE BUILDER, JANUARY 7, 1905.



SCHEME FOR THE TREATMENT OF KING'S CROSS STATION FAÇADE AS A DECORATIVE DESIGN IN MARBLE.

By MR. A. C. DICKIE, A.R.I.B.A.



Riverside, Whitehall (Paul Sandby 1734)



Duchess of Portland's House (J. Bonnet 1796)



Whitehall Yard (J. Knapton 1841)



Old Downing Street (Duckett 1821)



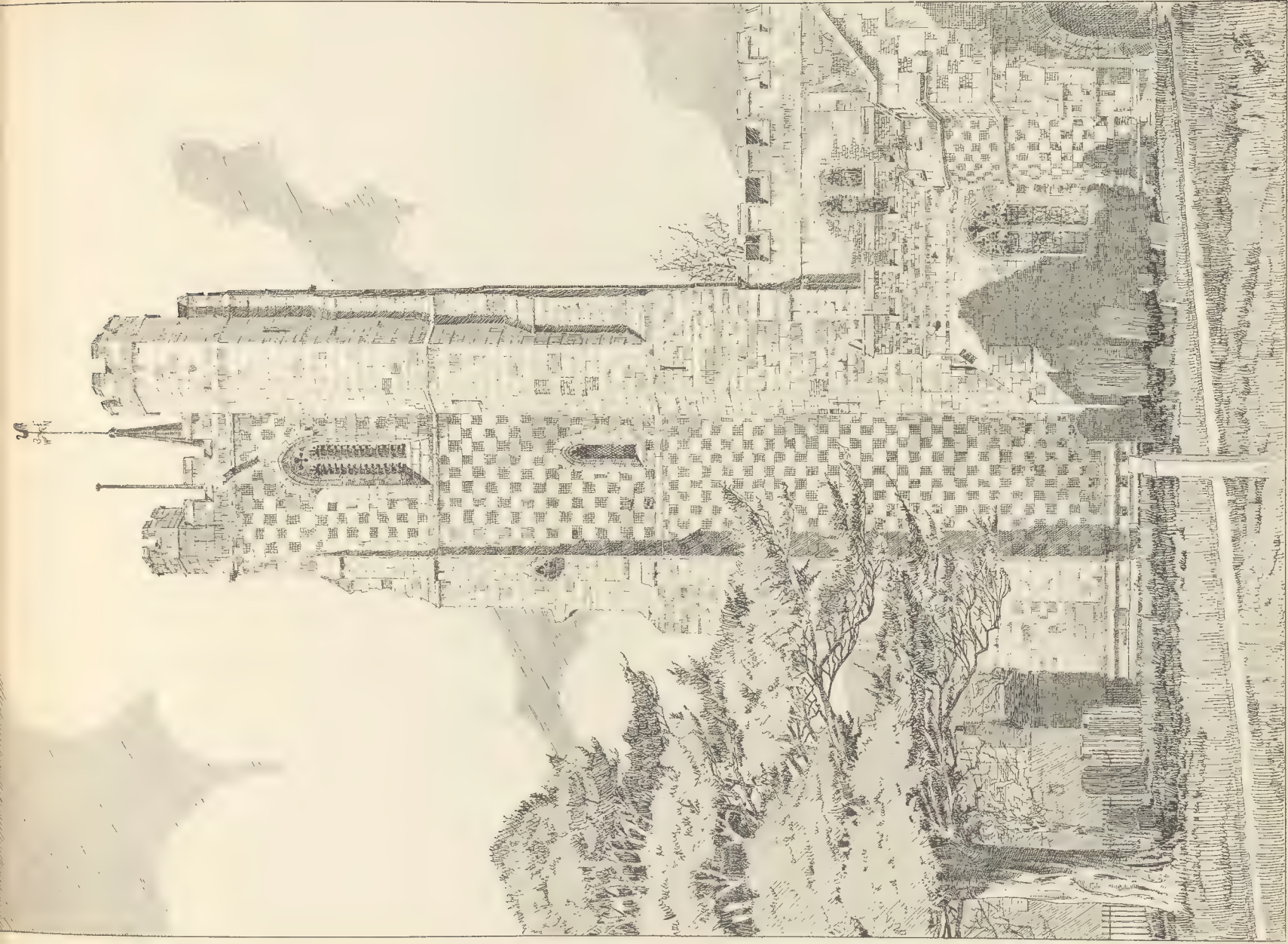
Fludyer Street (Shepherd 1839)



The Irons, Garden and the Banqueting House (J. Mallon 1794)



Charing Cross and Northumberland House (Birkbeck, after Canaletto 1733)



LUTON CHURCH, BEDFORDSHIRE: THE TOWER FROM THE SOUTH

ILLUSTRATIONS.

Church of Neufchâtel-en-Bray, France.....	Drawn by Mr. J. Tavernor-Perry.
1. Exterior.	
2. Interior.	
Ruskin House, Rochester Row.....	Mr. Arthur Keen, F.R.I.B.A., Architect.
Bromley Public Offices Competition: First Premiated Design.....	By Mr. R. F. Atkinson.
1. Elevation and Upper Plan.	
2. Ground Plan.	

Illustrations in Text.

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The Thames Barrage Scheme.

VARIOUS remedies have been proposed within recent years for the present unsatisfactory condition of the Port of London, but notwithstanding the wisdom

introduced a Bill with the object of giving effect to the Report of the Royal Commission, and finally abandoned this measure in the following year. The London County Council are now promoting a Bill for the creation of a port authority on which the Council would have a predominant representation, and the Thames Conservancy Board have introduced a rival Port of London Bill. It may well be doubted whether Parliament will sanction either of these measures, but in any event their introduction and discussion may have the useful effect of rousing the Government to take action.

Another measure to be introduced for the consideration of Parliament during the coming Session is that which provides for endocking the river by the construction of a barrage between Gravesend and Tilbury.

Thus two alternatives will be submitted to Parliament; one involving the purchase of existing docks, the construction of new docks, and dredging operations extending over a period of ten years, at a cost which has been estimated at 37,000,000*l.*, and the other including nothing but the construction of a barrage and subsidiary works, at an estimated cost of a little more than 4,000,000*l.*

One effect of the first scheme would certainly be to remove various undesirable conditions resulting from the regulations of conflicting and overlapping authorities, but no improvement would be effected in the prohibitive charges for piloting vessels, and for loading and

discharging cargoes, and the dangers of navigation would not be reduced. The scheme does not give promise of any reduction of the present excessive dues, except by a heavy charge upon the overburdened ratepayers of the metropolis. The foregoing points are mainly of administrative character, and although our object in this article is to deal chiefly with engineering matters, they cannot be shut out entirely from consideration. On the whole, it must be admitted that the operation of a single port authority would be to ameliorate some disadvantageous conditions from which the port now suffers, while of necessity leaving others untouched.

Turning now to the question of dredging, we may say briefly that the proposal is to form a channel 600 ft. wide in the middle of the stream with a minimum depth of 30 ft. at low water, or about 15 ft. below the natural bed of the river. The cost of this work has been estimated at 2,500,000*l.* This scheme may appear to involve no difficulties, but consideration shows that several exist.

In the first place, it is impossible to deepen the channel above the Thames Tunnel, as the crown of that structure is too near the present bed of the river, and an injunction has already been granted against the Thames Conservancy prohibiting that body from dredging over the tunnel. This difficulty excludes the Pool from any benefit from the suggested new channel. Next, we are confronted by the probability that the channel might be filled up again almost as quickly as it could be dredged.

that is said to attach to a multitude of counsellors, nothing has been done. The Royal Commission on the Port of London, the Board of Trade, the Thames Conservancy, the London County Council, and the Dock Companies, have advocated dredging as a remedy for the insufficient depth of water in the tidal river for modern steamships, and as a partial remedy for delays caused by the necessity for tide-waiting opposite Tilbury and outside the dock entrances. Nothing has been suggested by any of the authorities mentioned for the purpose of removing the dangers now attending navigation, and which result from the flow and ebb of tides in a crowded river with narrow channels and many bends. No proposal has been made for reducing the present high charges for piloting vessels, and for discharging their cargoes by barge and otherwise. The suggestion is made by several authorities that a port trust should be constituted to purchase the undertakings of the dock companies, to deepen the channels by dredging, and to establish uniform regulations and charges.

In the Session of 1903 the Government

The experience of Glasgow is that, having spent 7,000,000*l.* in dredging the Clyde, nearly one million cubic yards of material have to be removed from the river every year at a heavy cost. In the case of the Thames, with a far more powerful scour, and a much greater tidal range, the difficulty and cost of keeping the channel open must be considerably more.

Again, we must not lose sight of the fact that the existing trough, of which the cross section has a slope of from 20:1 to 50:1, has been formed as a result of natural conditions, and that any artificial alteration of its contour means a direct conflict with the forces of nature—a kind of warfare that inflicts always heavy loss upon the attacking party. The loss in the case of the Thames may be expected from two directions. Heavy and continuous dredging will probably be necessary to maintain the channel, and injury to the banks and river walls may follow the inward movement of material from the foreshores. The experience of Glasgow is sufficient to justify apprehension on the first score, and actual experience on the Thames shows the reality of the risks presented by the second. As an example we may cite the subsidence of the river wall at Barking as the result of the very mild dredging work hitherto conducted in the lower reaches of the river. At Boulogne, again, recent dredging operations have resulted in the collapse of some hundred yards of the quay, the masonry having cracked through from top to bottom. Engineers are now engaged in the endeavour to secure new foundations for rebuilding the walls, but the work is by no means completed. Although this case is not precisely analogous to that of the Thames, it is sufficient to suggest caution. If a deep channel were formed from London to Gravesend it is highly probable that the efforts of nature to restore equilibrium would cause the unstable material at the bed of the river to slide down, with consequent injury to banks and walls for many miles.

Finally, we have to bear in mind the fact that the formation of a deep channel will increase the tidal volume and the strength of the current, with a proportionate increase of the tidal range. These effects involve greater risk of flooding during exceptionally high tides, and further reduction in the depth of the river at low water.

The difficulties recapitulated do not constitute insuperable obstacles to dredging as a remedy for some defects of the Thames, but they are sufficient to show that the proposed method of treatment must not be authorised without the fullest inquiry, and if once commenced must be conducted with the greatest care and with due provision for guarding against possible injury to the river banks and adjoining property.

Let us next examine the alternative scheme for endocking the Thames by means of a barrage. This proposal was first outlined in the year 1885 by Mr. James Casey, who read a paper on the subject last week before the Civil and Mechanical Engineers' Society. Before discussing the points raised in this communication, it may be convenient to

describe briefly the constructional features of the proposed barrage and auxiliary works. The details of these have been worked out by Mr. T. W. Barber, M.Inst.C.E., and the previously mentioned estimate of cost is based upon the drawings of this engineer. The Gravesend end of the barrage is placed a little below the town pier, and the Tilbury end below the railway station near a point known as the World's End, and provides for vehicular and pedestrian traffic on the top and for railway traffic in a subway. According to the drawings the section of the Thames barrage is somewhat similar to that at Assuan on the Nile, but proportionately wider. The upstream face has a slight batter commencing at low-water level, the downstream face having a batter of about 1 to 2 from ordnance datum downward, and a concave projection near the top. The foundation rests upon solid chalk, and below the centre of the section is continued in a downward direction to provide for the formation of a railway tunnel 25 ft. high by 28 ft. wide with two sets of rails. On each side of the Parliamentary and municipal boundary in the middle of the river, are two navigation locks, the inner measuring 1,000 ft. long by 100 ft. wide, and the outer 800 ft. long by 80 ft. wide. Each of the four locks is furnished with internal gates in addition to those at the ends, so that the locks may be used in long or short lengths as desired, each of the outer locks being capable of division into two compartments 300 ft. and 500 ft. long respectively, and each of the inner locks into two compartments measuring 300 ft. and 700 ft. long respectively. The level of the lock sills is placed at 35 ft. below low water level, or about 10 ft. above the bed of the river. A projecting pier between the two inner locks on the downstream side will furnish accommodation for an electric power house, and it is proposed that current shall be generated by dynamos operated by water power. At the end of the pier a pilot tower would be erected from which signals for the regulation of traffic will be given, and the locks, bridges, and sluices will be controlled. On each side of the locks a number of adjustable steel sluices would be provided at the top and bottom of the barrage, of area sufficient to regulate the flow and necessary scour of the river bottom during ebb tide. According to the preliminary drawings the top of the barrage is about 5 ft. above Trinity high-water level, but in view of recent high tides it would be wise to make a further increase in the height so as to keep the roadway well above the water under all circumstances. The proposal is to build the barrage of mass concrete faced with granite. All the main features of the work appear to have been thought out carefully, and from a purely constructional standpoint there is no doubt that a dam could be successfully built on the site proposed.

As to the satisfactory operation of such a work river engineers and port authorities may not unreasonably entertain doubts. The author of the scheme, who, as a naval architect, has been professionally connected with the river Thames for nearly forty-five years.

puts forward in his paper several strong arguments in favour of the barrage. We agree with his contention that the establishment of permanent high-water level between Gravesend and Teddington would at once remove the difficulties and inconveniences now attending the navigation of the river.

The deep water basin so provided should be of immense value to the Admiralty, rendering available for the British fleet a harbour in touch with the Royal Victualling Yard at Deptford, the Royal Arsenal and Gun Factory at Woolwich, and with the Dockyard at the latter place, now abandoned, but quite capable of resuscitation under more favourable conditions. Further, the tunnel affording railway communication between the Northern lines and the South Coast should be of great advantage, relieving London of much unnecessary traffic, and placing at the disposal of the Admiralty and the War Office a valuable connexion in time of need.

By means of the barrage the present, unsightly foreshores of the river would be covered. Vessels and barges would be able to enter the docks and draw up alongside wharves at all hours of the day, the flooding of low-lying areas from the sea would be a thing of the past, and the usefulness of the river as a highway for traffic would be vastly increased. These and other evident advantages must be admitted, but the possibility, or, as some well-qualified experts think, the probability of accompanying disadvantages of most vital character must not be overlooked.

The most important of all the objections that have been made against the project is that the navigable channels below the barrage will become silted up owing to the prevention of flow and ebb in the tidal river. On this point an engineer with a wide experience of Indian rivers has expressed the opinion that the construction of the barrage might mean the destruction of the Port of London; while another engineer, with an equally extended experience of river-regulating works in India and in Egypt, has stated the more guarded view that the barrage might result in the silting up of the lower channels. That an increased deposition of silt will take place seems to be highly probable. The point for consideration is whether this tendency can be counteracted by means that are economically practicable. It should not be forgotten that the natural action of the tides will still continue up the river as far as Gravesend, and that the ebb will be assisted by the flow of water from the locks and the overflow sluices of the barrage. If necessary, it could be further assisted by opening the scouring sluices at the base of the dam. As the volume of the water held up will be equal to nearly 5,000 million cubic ft. no difficulty should be experienced in providing for effective sluicing. But if these means prove insufficient for maintaining the waterway, recourse must be had to dredging, which seems, however, a less arduous undertaking than the dredging of 26 miles of the river as proposed by the Royal Commission. In connexion with tidal action, we may point out that at present the flood tide brings in more silt than the ebb tide carries away,

because the latter being weaker gives more time for the deposition of suspended matter. This view is supported by the report of the Charles River Committee, a body appointed by the Commonwealth of Massachusetts "to consider the advisability and feasibility of building a dam across the Charles River" discharging into Boston Harbour. In many respects the conditions of this river resemble those of the Thames, and it is worthy of note that after exhaustive investigation by engineering, medical, sanitary, biological, and geological experts, the construction of the dam was finally decided upon, and authorised by the Legislature in June, 1903. We believe this to be the first instance in which the endowment of a tidal river has been undertaken. Hence the completion of the works will be awaited with great interest by all who are concerned in similar projects.

With regard to the precise effect of a barrage at Gravesend upon the Thames no one can speak with absolute certainty until the most searching inquiry has been made. Looking at the whole matter with strict impartiality, we think that the proposed scheme of dredging would involve far more burdensome expenditure than its advocates imagine, while the advantages gained would be comparatively small. On the other hand, while admitting the complete regeneration of the Port of London that would follow the creation of the barrage if the views of its promoters be correct, we are not yet prepared to accept those views in their entirety. But we have shown that there are reasons for believing that the construction of the barrage might exercise no prejudicial influence on the lower channels of the tidal river, and this being so we are strongly in favour of the fullest inquiry into the merits of the project.

NOTES.

Water Rights.

IMPORTANT as the provision of water to large cities undoubtedly is, the rights of

other people must not be infringed. This is a condition which is likely to cause far more trouble in the future than it has done in the past. Since the wave of municipal government has passed over the entire length and breadth of the land, water rights have been mapped out, and closely watched by those to whom they properly belong. When arranging for their Welsh water supply, the Birmingham Corporation were obliged to guarantee the supply of 27 million gallons daily to the river Wye as compensation water to set off the submersion in their reservoir of the Elan and the Clerwen, both these being tributaries of the Wye. Finding it desirable to command further supplies, the Corporation propose to ask Parliament for sanction to reduce the amount of compensation water by 7 million gallons daily. This would be a very cheap way of obtaining an increased supply, but the county and town councils along the Wye valley are very wisely combining to defeat the scheme. As matters now stand the flow of water down the Wye is not too plentiful; and any further diminution would be distinctly

prejudicial to the river itself and to the owners of property on its banks.

The Government and the local authorities the War Office continues to rob the

foreshore at Whitecliff Bay, with the acquiescence of the lord of the manor. Finding the War Office obdurate, and the Board of Trade unwilling to interfere, the Rural District Council have now sent two reports to the lord of the manor in the hope that he will forbid further removal of shingle. One report is in the form of a further letter from Mr. Cole-nutt, F.G.S., who, having studied the geological features of Whitecliff Bay for the last thirty years, states that the denudation of the beach will inevitably cause disastrous erosion of the cliffs along the whole sweep of the bay, and points out that the waves are already washing away parts of the cliff that have not previously been touched by the sea. The second opinion is from Sir Archibald Geikie, who entirely corroborates the views of the local expert. Whether the appeal will be successful or not we cannot venture to predict, but as the lord of the manor is a retired Army officer he may not like to take any unfriendly action with regard to the War Office. After all, the chief offenders are the officials of His Majesty's Government, who claim absolute authority over the foreshores, and are now setting a most pernicious example to other evil-doers throughout the kingdom.

Heavy Motor Cars.

THE new order of the Local Government Board with regard to heavy motor cars,

which will come into force on March 1, will cause some trepidation to the rate-payers. The maximum weight of motor cars has been increased from three tons to five tons, and the joint weight of the motor and its trailer may be as much as six and a half tons. The loaded car may weigh with its load twelve tons, but the weight borne on any one axle is not to exceed eight tons. It is a matter of common experience that such weights, not supported on rails, are incapable of being taken along roads made up in the ordinary way without causing considerable damage, whatever precautions are taken as to the width of the tyres. Already there is a very strong feeling in country districts on this subject in connexion with traction engines. Because one or two persons choose to employ traction engines in their business the roads during the winter are made impassable for both vehicular and foot traffic, and the amounts recovered by the authorities for extraordinary traffic in no way compensate the individual. Motor cars not working on the same route day by day will not even be liable to make any compensation, and this development of motor traffic may be the cause of great injustice to the rate-payers.

Drains in London Schools.

SOME of the managers of the non-provided or former "voluntary" schools in

London seem to be rather troubled because the London County Council has directed an inspection of the drains of the non-provided schools, which is now being carried out. It is a most

desirable proceeding, and is a necessary preliminary to any demand by the Education Authority for sanitary work on this point. It is obvious that the drains of every school should be periodically tested. Many outbreaks of illness are probably due to bad drainage in elementary schools, and we should like to see this step of the London County Council followed all over England, and continued year by year. There are many of the higher schools of the country which would benefit from a similar procedure.

Building By-laws as to Sheds.

MR. CLAUDE ROBSON, the engineer to the Willenden District Council, in his last annual Report, mentioning the case of two sheds built in contravention of the by-laws, observes that this question of wooden sheds is a difficult one to deal with, and requires a new by-law. An official can only recognise the strict letter of the by-law, according to which it is impossible for anyone to build or place a wooden shed in his back garden, be it ever so small, unless he can claim exemption from the by-laws under clause 2, sub-sections h, i, or g. This seems unreasonable, but the difficulty is where to draw the line, as a multiplication of these sheds, or the erection of wooden buildings of considerable capacity, become very unsightly, and may prove dangerous in case of fire. A by-law, adds Mr. Robson, is required exempting sheds under a certain size.

Proposal for the London County Hall.

MR. A. R. BENNETT sends

us a pamphlet with description and illustrations of a scheme for a new bridge over the Thames, with a roadway commencing at St. Clement Danes church and connecting with two new thoroughfares on the Southwark side, with the proposal to build the new County Hall on this bridge, extending over six of its proposed eight arches. It is undoubtedly a picturesque idea, but it is useless to propose it, for two reasons. In the first place, neither the Thames Conservancy nor whatever authority may succeed to them would now permit a bridge to be built across the Thames with the number and the area of piers that would be required to carry the proposed structure—it would be too great a throttling of the river; and secondly, unless the bridge were made of a most abnormal width (which would be an increased objection under the first head), the necessarily long and narrow plan of the County Hall which would result would be a very inconvenient one; such a building requires a square type of plan, with internal communication as concentrated as possible. Under present-day conditions, in such a city as London, and with such a river as the Thames, a scheme like this is purely Utopian. It is no use to reproduce views of old London Bridge; they are very picturesque, no doubt, but they belong to a state of things that has passed away for ever.

A Market Cross for the City.

In accordance with the terms of the recent Lena Brown bequest to the Corporation of the City, the civic authorities have decided to open a competition, under

the assessorship of the President of the Institute of Architects, in respect of designs to carry out that lady's intention. The testatrix directed by her will that a portion of her estate should be applied to the erection, apart from the purchase of the site, of an ornamental structure to be designed after the Gothic style, and with certain specified restrictions as to the materials employed, which shall take the shape of a market cross, to serve also as a street refuge or clock-tower, in the central portion of London. It is a great pity that the donor, for want of the best advice, should have made the mistake of fixing a "style," and that style the Gothic; thereby precluding any chance of the cross rightly representing the art of the present day.

Mr. Clausen's
Lectures on
Painting.

MR. GEO. CLAUSEN delivered the first of his four lectures to the Royal Academy students on Painting. There was a very large attendance of visitors. The subject was "Truth to Nature" and "Style," considered together. Quoting Reynolds to the effect that the study of nature was the beginning and end of all theory, and that we could have no idea of beauty superior to nature, he observed that rules of art only taught us different ways of seeing nature. All truth to nature was not equally commendable. "Style" in its broader sense meant the expression of that which was typical, as we saw in such a figure as the Ilyssus. Faces and figures varied, but all were referable to a normal type which was to be expressed in art. Style did not lie in symmetry or proportion; many of the Tanagra figures were deficient in those qualities, but they all had style. Throwing on the screen enlarged views of some figures from Roman coins and sculpture, he showed how on the small scale all unnecessary detail was omitted, the figures being reduced to simplicity of line. It was well to study especially any work which compelled our admiration, and find the reason of its excellence. A return to the antique, after the study of the natural figure, was useful as showing what constituted style. It was to be remembered that we could approach nothing in a spirit of absolute detachment; we inherited the methods of seeing nature of those who had preceded us, and a study of their work was helpful. A man whose natural talent was for *genre* or Still Life should not attempt imaginative work against his nature; style could be shown as well in simple subjects as in loftier ones. What kept a work living was the artist's perception of the essential type. To the excuse "I did it from nature," in reference to a faulty work, the answer might well be—"Is that all you saw in nature?" Rousseau said "everything springs from the universal," and a painting of a stone might be of interest if it represented what was universal in nature. This view of art led to simplifying design, as illustrated in Millet's drawing of a girl seated by a stream; there seemed at first sight to be little in it, but it was in its simplicity that its power lay. Watts had given him (the lecturer) a piece of advice, when he complained of

the difficulty of getting a model posed as he wanted, and said "one has to trust to memory." Watts replied that knowledge was better than memory; if you *knew* the exact shape of a bone you could draw it in any position. There was a great difference between "knowledge" and "skill"; it was not always the most skilful executants who succeeded in the end. The greatest works attracted by their apparent simplicity; they produced the feeling that you could go home and do the same thing. It was true that you could not, but that was the impression produced by the simplicity of great work. Mr. Clausen concluded by quoting from an ancient Chinese artist some maxims which showed that the aims of the best artists were then much the same as they are now. "If you want to work without rules," was one of these sayings, "first follow every rule."

Society of
Fine Arts

THE twenty-one water-colour drawings by Miss Ruth Dollman, which occupy one wall in one of the rooms of the Fine Art Society, are of no ordinary excellence. They represent true feeling for nature, and for landscape composition. "Hares in the Coombe" (6) is the title for what is really a landscape in the downs, with beautiful gradations of distance; "Afternoon" (8) is a scene of the same kind, noteworthy also for the tender and delicate light in the sky over the distance. Among landscapes with more incident in them are "Ditchling Beacon" (13) and "The Two Mills" (16), both of them especially good in regard to composition. "The Old Road" (14), a bit of a disused road in a chalk district, makes an interesting picture out of almost, one may say, no material at all. Some studies of foreground subjects, especially "Easter Bloom" (4) and "Cowslips" (12), show that the artist has a capacity for the treatment of detail as well as of distance, and two life-size flowers, "Narcissus" (1) and "Daffodils" (21), are decoratively hung as the two flanking objects at each end of the line. The exhibition, though small, is a very interesting one.

Sketches
of India.

MR. GOODMAN'S pictures of Indian scenes and sites, exhibited at the Leicester Gallery, are for the most part rather what we call topographical art; that is to say, they are more interesting as illustrations of the scenes than for their intrinsic artistic quality. The large painting of "The Himalayas from Darjeeling" (46) is an effective landscape, as well as one or two smaller Himalaya pictures; otherwise the sketches of different places are simply sketches of the places; and the architecture is nowhere very well treated. The Taj Mahal, with all its abundance of surface decoration, can hardly, even at some distance, appear in a bright sun as a perfectly flat whitish surface, a mere silhouette; and it is the same with other buildings introduced; the architectural character is not conveyed.

How to
Obtain
a Reredos.

THE following letter, received from an English church dignitary, furnishes an amusing example of the curious

ideas some people have as to the way to set about getting an architectural design:—

"DEAR SIR,—I have to send out designs for a Reredos to be erected in my cathedral at (a fine building, architecturally on the lines of Nestley Abbey). It will stand at a good elevation, below three large Lancet windows.

"I should esteem it a great favour if you would be so kind as to furnish me with designs suitable for such Reredos which may have appeared in recent Nos of the *Builder*. If you will be so good as to let me have them by return of post (with cost of same) I can send them out by next mail, and will also remit cost to you."

Whether our correspondent imagined that we sold designs for reredoses "by return of post," or whether the remittance was only to be the cost of the copies of this journal, is not quite apparent. At all events, it was suggested to him that a reredos designed for one situation was not likely to fit another, either in respect of dimensions or otherwise; that designs for reredoses lent to us for publication were not supposed to be made use of for new situations without the permission of the original designers; and lastly, that if there was an architect employed over the cathedral in question, could not he design a reredos?

THE INTERNATIONAL SOCIETY'S EXHIBITION.

THE Fifth Exhibition of the "International Society of Sculptors, Painters, and Gravers," at the New Gallery, is on the whole the most interesting they have held. There are no doubt some very bad and a good many rather commonplace pictures, but nothing so ugly and repelling as some of the works in last year's exhibition.

The collection is strongest in landscape, in which branch of art there are some very fine and a good many interesting and original works. Among these the first place must certainly be given to Mr. Bertram Priestman's large and fine landscape with cattle, "The Meadow's Stream" (178), which occupies a central position in the West Gallery; a painting broad in style but not overlooking or slighting detail, and full of light and air. Mr. Grosvenor Thomas's "Cluden Waters" (216), which occupies the centre position on the opposite wall, illustrates, on the other hand, the passing of the point at which breadth degenerates into confusion of forms; its general effect is powerful, but it wants charm and aerial effect; it is a large study for a landscape rather than a finished work. Among other landscapes in the same room Mr. Montague Smythe's "The House on the Marsh" (174), a romance, is a work of much power of effect, and that kind of sinister suggestion of melancholy or tragedy which gives to a landscape a kind of dramatic significance. Mr. Millie Dow's "Springtime in Cornwall" (175), a view over open country from a high foreground, is somewhat too naïve in style and execution, one result of which is that the distance does not recede sufficiently, and the effect is that of a diagram of a landscape rather than a view in the open-air; but it is not without its charm. Mr. James Paterson's "Edinburgh: Dawn" (182) is a fine effect carefully studied. Herr Ludwig Dill's "Gewitter im Moor" (192)—storm-clouds over an open common, suggests that he has a style of his own, though when we come to his next work, "Wachholder in Weiden" (197), we are perhaps tempted to think that what we took for a style is only a manner; however, in the "Gewitter" the clouds are finely handled, in broad masses of light and dark. Mr. Thaulow's "Suburbs" (202) is a comfortless-looking snow picture with a freezing river before the houses; Mr. Bruckman, in "The Heart of the South Downs" (230), reminds one of Maris, and is hardly inferior to his model; Mr. Peppercorn's "The Road by the River" (234) is a powerful composition, a little too ragged in the foreground trees; and Mr. Oliver Hall's "The After-math" (237) has a fine depth of shadow and largeness of style about it which remind one of a Rembrandt.

andscape. Mrs. Dods-Withers's "Stirling Castle" (289) in the north gallery is too dark and heavy in tone, and Mr. Walter Sickert, in a large and (in one sense) carefully finished painting of St. Mark's, Venice (313), has succeeded in making St. Mark's also look dingy, which one had not before thought possible. A more satisfactory though less ambitious architectural picture is Mr. Sydney Lee's "The Barbican Gate" (317), the entrance to some old walled town, between round flanking towers with chequered masonry in dark and light squares. This, it is true, rather wants historical character, but as a painting of old buildings it is good. Mr. Mark Fisher has a landscape, "A Garden" (277), in which his peculiar spottiness of execution has rather wrecked the effect; there is no salient point in the picture. Mr. Jamieson's "As Dieppe" (281) and Mr. Raffaelli's "Paysage de Bretagne" (303) are works deserving of mention.

Among the figure pictures the finest undoubtedly is Mr. Lavery's "Polymnia" (235), so all intents and purposes a full-length portrait of a young lady in black standing by a piano, showing a noble and finely-painted head, and in attitude in which dignity and grace are combined. This is too graceful and not odd or jerky enough, however, to please the advanced critics, who apparently prefer M. Blanche's hard and stiff figure on the opposite wall, called "The Summer Girl" (195), which it is difficult to say whether it has not been painted partly as a joke. Mr. Chase's portrait of Whistler (251) one may take to be entirely a joke (whether conscious or not), an attempt to out-Whistler Whistler in a portrait of himself. Mr. Carolus-Duran sends a rather odd portrait of a little girl of his own name (187), probably a little grand-daughter, painted with all his usual conscientious finish, but not very attractive in colour. Among other portraits are M. Blanche's of M. Rodin (255), looking rather like a government official addressing a meeting; and Mr. Lavery's of Elizabeth Wels' (308), which we do not like nearly so much as his "Polymnia." Figure subjects other than portraits are not very important, and it appears that it is among the tendencies at the International to imitate the manner of painters, living or dead, who enjoy fame among the irreconcilables. Mr. Chase's imitation of Whistler we have already mentioned; Mr. Walton's figure of a young girl under the title "The Portrait" (298) is an obvious reminiscence of a well-known Whistler portrait of a child. M. Carrière's "Etude Après Nature" (300) is a painting of a man and woman in that misty undefined manner which this painter started as a new note, and in Mr. Livens's picture in the West Room, "The Builders" (173), we find M. Carrière at second-hand, in a picture of two children half seen through a fog; a picture clever in its way, but the trick is old now. Of course there is nothing able to explain the title, for you cannot see what the children are doing; but that is another joke of the new school, to give a picture the title which is quite inexplicable; that makes people look hard at it to find out its meaning. Then Madame Dorph, of Copenhagen, gives us an "Eve" (221) in the manner of Botticelli; and so on. Of the painters who have their own very individual manner there are two examples of M. Cottet, a painter who omitted great things but has more or less wrecked himself in his search after dark and sombre effects, till it is difficult to see his pictures at all:

"Darker and darker
The black shadows fall,"

the pictures give the idea of having been painted with brushes dipped in the ink-pot. Mr. Austen Brown will lose himself in the same track if he does not take care; he still retains warmth and richness of tone, though of a rather sombre kind; but his two pictures, "Weed burning" (194) and "Mowers" (248), with fine qualities, show (the latter especially) the danger of overdoing a source of effect; "Mowers" the figures have already become most as ghosts in the gloom. When this kind of effect is once taken up as a special individualism in painting, the tendency always is to exaggerate it year after year, till it becomes a mannerism that leads the artist to wreck.

The South Gallery contains a good many very interesting works in black and white. There is a small collection of Verger's grotesque and exceedingly clever pen drawings. Mr. Pitt, the American engraver, is represented by

a series of engravings of the most delicate execution, though he does not always follow the best principle of wood-engraving, that of modelling surfaces by contour lines; there is one head, indeed, which is entirely shaded in vertical lines. Mr. Timothy Cole's engravings, of which there are four examples, though with less apparent delicacy of finish, are executed in a more artistic spirit, and represent the highest class of art in wood-engraving. Mr. Pennell has a series of etchings of "The Sky-scrapers of New York," the tall buildings which have made modern New York a city of towers; these are very powerful and effective. There is also a large collection of the drawings of Frederick Sandys.

The Central Hall has been specially arranged for this exhibition, the spaces between the columns being filled in with temporary white screens, which are supposed to furnish an effective background for the sculpture, but on the other hand contract the visible space of the hall, and the dark spaces formed behind the screens are of course lost for exhibition purposes. M. Rodin's life-size plaster sketch of a recumbent female figure is a very fine idea for a work in sculpture, but merely roughed out, the feet being hardly modelled at all. Such a rough sketch would probably not find admission into an Academy exhibition at all, and is more in place as a studio study than as a work for exhibition; but it is part of the gospel of the New Art that one is to accept promise for performance. One of M. Rodin's grotesque fantasies is also shown in "La Main de Dieu," a colossal hand holding up a piece of rock against which a man and woman seem to cling. This is finished, but it is more curious than beautiful. The group in grey-veined marble of the Sphinx and her victim, by M. Glicenstein, of Rome, is evidently done under Rodinesque influence; it is a rather remarkable work, the effect of which is a good deal marred by the parti-coloured material in which it is executed. Mr. Toft's nude bronze figure, "Victory," is not sufficiently heroic and abstract in style for such a subject; it seems too much of a realistic reproduction of a nude model, the legs being rather too short, and the waist the pinched waist of a figure that has been laced into tight modern dresses. One has to go back to antique models for a figure to express this kind of ideal.

NEUFCHÂTEL-EN-BRAY.

THE history of Neufchâtel, though much the same as that of the rest of Upper Normandy, has sufficient individuality to make it interesting. It had, what so many of the Newcastles of England and Ireland have not, a past; and not like them new, in that it had never been old and merely a castle, and nothing else. Until the beginning of the XIIth century the town was known as Driencourt, and this name frequently occurs in Norman annals in reference to its lords; and it was not until Henry I. erected a new castle there that it began to be called "Noët Chastel." With the rest of the province, the town was lost to France in the wars of King John, and, although it was on the track of Edward III. in his raid through Normandy, it did not remain an acknowledged portion of the English Conquests after the treaty of Bretigny. But in the next century Henry V. took possession of it, with the rest of Normandy, after his siege of Rouen; and for nearly fifty years it remained in English hands until, in 1449, it was captured by the French under the Count d'Eu. While the country was divided by the wars of the religion, and English inroads by way of Dieppe were not infrequent, Neufchâtel, as a strong fortress on the high road to Paris, was of importance; but with the settlement of the religious difficulties in France, which culminated in the issue of the Edict of Nantes, English interference in the affairs of France became unlikely, and the fortifications ceased to be of value; and in 1496 Henry IV. ordered the castle and ramparts to be destroyed.

In its earlier and pre-military days one church served for the township of Driencourt, the church of St. Pierre, the ruins of which still stand by the mill-stream; but with its increased importance, and, perhaps, added population, in the XIIth century, two more churches were built in the higher parts of the town—one, St. Jacques, which has disappeared, and the other Notre Dame, which is still in use. Of these three churches few records have been published, but from what their remains show their

history may be roughly sketched. Of St. Pierre, although founded before the XIIth century, nothing has survived but a small piece of a ruined apse of the XVth century or later, now converted into a dwelling-house. St. Jacques, which was a large church and once held the relics of Ste. Clotilde (now supposed to be deposited in Notre Dame), was severely damaged, if not destroyed, in 1591, during the civil wars, but was repaired or rebuilt, only to be again destroyed in the Revolution. Notre Dame, standing in the market square, surrounded by picturesque houses, in spite of fire, siege, and revolution, still dominates the town.

At the first building of Notre Dame, in the XIIth century, it was of the usual Anglo-Norman type, of much the same plan, if not of the same extent, as the present church, and with the usual central tower. Of this original church there only remain the piers and the external arcading of the upper part of the central tower, and these show that, although the original church was a cross church with aisles, it was nothing like so lofty as the present one. Probably the choir and transepts were rebuilt in the middle of the XIIth century, and, if one may judge of the work by the restoration of it, in the best manner of the period. Whether the nave also was rebuilt at the same time is uncertain, though probably not, but in 1472 the whole church was nearly destroyed by a great conflagration. No doubt the spire of the central tower perished at the same time, for, when the repairs of the choir and the rebuilding of the nave were begun at the end of the XVth century, they commenced a massive tower at the west end. This tower, which is a remarkable specimen of its style and period, was never completed, want of funds and some weakness it showed in the course of its construction causing the work to be discontinued; but in its unfinished state, crowned with a lofty slate spire and pinnacles, it forms a most picturesque mass. It has a magnificent and lofty portal, with seated figures round the arch and that rich lace-work so peculiar to the latest phase of French Gothic; and above it is a rich flamboyant rose window in a deeply-recessed arch. All the work is in a very ruined condition, the carvings destroyed, and all much patched up with brickwork; but better so than in the over-restored condition of the east end and the interior. The north and south faces of the tower were prepared for great traceried windows, but, in consequence of the weakness that was showing, these were built up and a great buttress inserted in the centre of each. The belfry stage of the tower was never completed, but from the little that was built it would appear that they intended to cover it with rich stone tracery.

The nave of the church is of a date entirely subsequent to the fire, and is of the latest flamboyant mixed with renaissance details. The well-known architects, Grappin, of whom there were three generations, were working near by at Gisors, and Hector Sohier, of Caen, at Dieppe, on the east end of St. Jacques, at the same date, and to one of them may be attributed the design for the work. Many of the features, particularly on the south side, are quite classic; the capitals of the vaulting shafts are Ionic, and the mouldings of the great piers Roman. But the pendants to the vaulting, perhaps, are the most noticeable features, not only for their size, but for their Cupids' heads, vases, and other cinque-cento embellishments. The south transept was rebuilt at a little earlier period than the nave, more purely flamboyant, with an apsidal termination, and it contains a late and very rich entombment, with life-sized figures.

The choir, as restored, is a fine example of early work, and in many respects it is very English in its character. The aisles have a square ending, and the apsidal termination has no surrounding chapels; the triforium is pierced for windows, so that at the east end there are three tiers of windows over each other.

The town abounds in wooden houses, and, though they have been generally in the main streets refaced or plastered over, the gables and dormer windows cannot be disguised; and in the numerous side streets and lanes many of the houses can be seen in their original condition. One of such, known as the Maison des Templiers, retains externally a good deal of its ancient carving. Opposite the church tower is a café with the title, "Les Halles," which was no doubt the original market-hall of the town, and it bears a curious bas-relief

over the gateway of a cardinal's hat and the date 1621.

There was a large convent of Bernardines here, which has been destroyed, and the site of the church is occupied by a modern and ugly *hotel de ville*. In this building are housed the public library and a museum of antiquities of no great interest, but there is quite enough without them to tempt the traveller to put up for a day or two at the good old-fashioned *Hôtel du Grand Cerf*, at Neufchâtel-en-Bray; and to him I would repeat the advice given by M. l'Abbé de Cordé, not to drink, good though it is, too much cider, and to remember:—

"Jamais homme sage
Ne manges fromage."

The arms of Neufchâtel were anciently "Az. three castles arg., two and one," but they were augmented on the union of Normandy with France, or after the restoration in 1815, by "in chief, three fleur-de-lis or."

J. TAVENOR-PERRY.

MAGAZINES AND REVIEWS.

THE *Art Journal* opens with a very long article by Mr. Claude Phillips, on, or *à propos* of, the recently acquired Titian at the National Gallery claimed to be the portrait of Ariosto, and also claimed by some to be a work of Giorgione, whose art in some respects it no doubt resembles. Mr. Phillips considers it a genuine Titian. The article goes into many comparisons with other pictures, claiming the "Concert" at the Pitti Palace, hitherto considered (he says) as "the typical Giorgione" (we should not go as far as that), as a Titian. As far as feeling and expression go, the centre head seems to us to have more of Giorgione than of Titian about it. The unsatisfactory part of these critical disquisitions is that one never seems any nearer certainty after all the argument. An article on "Art Handiwork," to be continued, forms an accompaniment to some illustrations of various examples of what is called "Art Handiwork." The writer of the article seems to recognise that "efforts to re-constitute a perished ideal of life" are "liable to the dangers of artificiality." That is what we have always felt, and some of the things illustrated in connexion with this article show it; the music-room, for instance, "carried out by Goodyears" (the courtesy of "Mr." or "Messrs." seems to be considered out of place in connexion with "Art Handiwork"). The whole of this room design is a deliberate attempt at an acted simplicity; it all says "see how plain and simple this is, how devoid of pretence"; whereas it is itself a pretence of another kind; nor does it represent the music-room of a cultured society; it is a cottager's music-room, just as the four-post bed by Messrs. Heal is a cottage bedstead. Should the four-post bed be revived at all? is a question. We admit, as the writer says, that it does give dignity, but in crowded towns it is not a health-promoting piece of furniture; it may be allowable in roomy country mansions surrounded with air space. We have the same objection to Messrs. Heal's two wardrobes illustrated; they show how a perfectly simple thing may be agreeable through honest structure; but they have not the refinement which should appear in the furniture of a first-class residence. Messrs. Doulton's vases, which form another illustration, are rich objects with none of this over-acted simplicity; so is the silk damask by Messrs. Warner & Sons, which is an imitation however of the Adam style (the frequent mistake of saying "Adams" style is once more repeated in the title). The fact is, the very expression "Art Handiwork" in connexion with furniture and other such objects shows in itself that something is wrong. There has been no doubt art-handiwork in former times, in objects specially made at great cost for kings' and noblemen's palaces; but in the days when all furniture was pleasing and in good taste there was, in the general type of production, no thought of "Art Handiwork"; a thing was made as well as possible and in a manner that interested the workman, and therefore the purchaser; that was the way of making it, and there was no thought of making it different from other furniture or of appealing to special tastes. As it is, the word "art," when used (rather ungrammatically) as an adjective, is a confession of a pose. Let people learn to make all furniture as well as possible, and encourage the workman to take personal interest in his work, and then all furniture will be art-furniture, only we shall hear no more of that irritating expression.

The *Burlington Magazine* contains three valuable articles; one on the sculptures in Lansdowne House, by Mr. A. H. Smith, with some fine illustrations; one by Miss May Morris, on the textile work known as "Opus Anglicanum," and represented now, we are told, by only about twenty or thirty pieces, chiefly copes; and one by Mr. J. P. Richter on "Early Christian Art in the Roman Catacombs." This last is the most interesting of the three, and it is a pity that it is not illustrated with some examples of the work described; but it is at all events a very good summary of the subject. Mr. Richter takes the view that the early Byzantine art in Rome is of interest not so much for itself as because it is a survival of a better Christian art which preceded it. "What is the quality which justifies interest in things so really tasteless and ugly as the mosaics of S. Lorenzo fuori la Mura, of S. Marco, of S. Maria Nuova? It is that they are petrefactions (sic), that is to say evidences of the pre-existence of living things, different to themselves, though formally similar. Romano-Byzantine art has the scientific value of a petrification." This we surmise is true, though we do not understand why "petrification" should be spelt wrong, twice over. There is another absurd mistake in the same number, in the title of a plate, "Hermes tying his sandal"; this is corrected on a slip, and is probably a printer's error; but where were the eyes of the "reader"? The first illustration to Miss Morris's article, the Syon cope, is a very good example of the system of design she draws attention to, in which figures are arranged in semi-architectural compartments radiating towards the circumference of the cope, which when displayed forms a half-circle, the object of the radiating arrangement being obviously to provide for the design showing in proper lines when the cope is worn, and when its semi-circular form is distorted; by the radiating arrangement the figures would appear to fall in with the lines into which the cope falls when in use. There are some interesting remarks on the difference in treating the modelling of features in English and in Florentine textile work of this class, illustrated by two diagrams showing the direction of the main lines of the needlework in each case. The Italian method seems to us far the best of the two; in it the eye is taken as the centre and the lines follow in enlarging curves which finally blend into the curves of the chin and neck. In the English diagram there are separate centres of curved sewing, both on the cheeks and neck, which have no reference to the outline of the head or neck, and produce the effect of tattooing, though this is probably not so prominent in the executed work as in the diagram.

The *Architectural Record* (New York) contains an article on and illustrations of the new premises of the Havana Tobacco Company, of which Messrs. McKim, Mead, & White are the architects. The firm advertised that they were about to open "the finest store" (Anglic — "shop") "in the world," and the result, judging from the illustrations of their columned halls, seems to bear out their boast. Of course this is a very exceptional shop, intended only for the kind of buyers who purchase their cigars in large quantities and are indifferent as to price; but it shows the possibility of treating what is, after all, a shop, as a piece of monumental architecture.

The *Berliner Architekturwelt* contains some very interesting work in this month's issue. An article and a number of illustrations are devoted to an interesting building in the "Dorotheen-strasse," Berlin, which has recently been saved from destruction. This is the present "Royal York Lodge," originally built at the beginning of the XVIII. century (the date 1712 stands over one of the doorways) by the architect Andreas Schlüter, as the country house of the Minister of State, Ernst Bogislav von Kamee. The building is characteristic of the "villa" of the period; over the four entrances are life-size groups representing the four quarters of the globe, and on the walls are four small oval bas-reliefs representing Watchfulness, Wisdom, Forethought, and Discretion, as the four chief virtues of a minister. The gardens were laid out in the style of that period, having grottoes and groves and a Mount Parnassus. The destruction of this building would have been all the more regrettable as it is perhaps the only remaining one of its kind, and one of the best examples of Schlüter's work. Among other illustrations of the number is a competition design for a Schiller Theatre at

Charlottenburg, by MM. Reinhardt & Süssengorth, which quite escapes the usual commonplace of theatre architecture, and one regrets that it is not, as far as appears, to be carried out. The plan, with its fan-shaped auditorium, is also of interest. Among the buildings illustrated is a new post-office in the Körnerstrasse, Berlin, a sensible but effective design in the mingled brick and stone architecture which seems to have been generally adopted for the German District Post-offices. As the architect's name is given, we may presume that this is an official building. The "Tiergartenhof," Charlottenburg, by Herr Baumgarten, is a good sensible piece of free classic architecture, free from the eccentricities which we too often find in modern German buildings. Some bookplates and a title-page to a romance, by Fraulein Wendtlandt, of Stegnitz, show fancy and imagination. Then there are portions of a new bridge in Berlin, the Rosstrassen Brücke, by Herr Hoffmann, the details of which are original and effective. There is much less of "l'art nouveau" in the number than we usually find.

In the *Architektonische Rundschau* the subject of sepulchral chapels (*Friedhof Kunst*) is continued; the illustrations are all taken, as before, either from American or German publications. France and England seem to be unknown countries to the editor of and writers in the *Rundschau*, which is certainly not as "all round" as its title would imply. The Germans, however, are certainly very inventive in this class of work; the design by Herr Mobius, of Leipzig, illustrated in the article, is the best of the examples given. Among the large plates there is really nothing calling for special remark.

In *Technics* three serial articles are continued: "The Metallurgy of Steel," by Mr. Percy Longmuir, who gives further illustrations of hardened and tempered steel and points out the lamentable lack of scientific knowledge on the subject of steel hardening; "The Electro-Magnetic Theory," by Mr. Edwin Edser, dealing with the directions followed by lines of force under different conditions, the measurement of the electric current, and electro-motive force; and "The Elements of Chemical Engineering," by Dr. Grossmann, devoted to the illustration and description of fire and steam-heated evaporating vessels. Among the other articles only two or three possess any direct interest to our readers. Students of mechanical engineering will find in "Epicyclic Trains," by Mr. Thornton Knowles, various examples indicating applications of epicyclic gearing to modern machinery, and electrical students who are not already in possession of the paper read by Mr. H. D. Symons before the Institution of Electrical Engineers will do well to study the reprint commenced in this issue under the title "Insulation and Insulators." A more generally useful contribution is one on "Recent Developments of Gas Lighting," by Mr. Thomas Holgate, M.Inst.C.E. The first part, appearing in the present issue describes and illustrates several types of gas burner, several of them well-known and others recently introduced. Tables containing data as to the consumption of gas and other particulars are included, and the article concludes with descriptions of automatic lighting apparatus, gas meters, and a carbolic acid recorder for use with water-gas plants.

Public Works includes an article by a French engineer, M. Arnodin, on "Crossing the English Channel," meaning, of course, schemes for dispensing with navigation. We are glad to see that the writer has common sense enough to pronounce emphatically against any Channel Tunnel scheme, on account of the immense risks attending it both in course of execution and afterwards.

"Even regarding matters in the most optimistically light and admitting the hypothesis that the tunnel could be pierced under the most favourable conditions, the problem of ventilation still remains to be solved, but we have not to forget that the tunnel would be over 31 miles in length, 205 miles of which would be under the sea. It is evident that such a distance cannot be traversed without ventilation shafts. Consequently, it would be necessary to form shafts in the open sea, for the installation of these shafts and also, of course, for their connexion to the tunnel. This would by no means be a simple matter with a head of water, which, as we have seen, would amount to 325 ft. at low water level."

In the Mont-Cenis tunnel, which is only 7.6 miles in length, and situated at an elevation where the currents of air are active and where deleterious and heavy steam can easily escape by the valleys, passengers experience discomfort when passing through in a slowly-moving train. What would be their condition if a train were delayed in this way? It is only reasonable to suppose that the discomfort would be vastly greater in the Channel tunnel, and this would be particularly unfortunate, for, in trying to avoid sea-sickness on the

surface, passengers would be exposed to a far greater evil below.

Finally, a still more formidable consideration is to be found in the fact that at no place is the earth free from seismic movements. If any such were to occur in the neighbourhood of the Channel, the lining of the tunnel would be fissured, whatever its construction, and the tunnel would immediately become impracticable for the water, rushing into the fissures with irresistible force under a pressure of ten atmospheres, would speedily flood the work. One shudders at the thought that the least tremor of the earth's crust would certainly lead to such a result.

M. Arnodin finds the idea of a canalway quite practicable save on the ground of the enormous cost, but to shut up the Channel navigation is obviously something not to be thought of. But he supports the idea of a high-level bridge, at an estimated cost of 34½ millions. We do not deny that the bridge might be practicable, but it is a serious question whether it is worth the cost, besides the objection being urged in these pages, of creating in a frequented sea like the Channel, very subject to heavy gales, what would be practically a series of reefs to add to the dangers of navigation. Improvement in steamship speed and accommodation is much more to the purpose than any of these extravagant schemes for connecting England with the main land. Other articles are on "The Control of the Nile," by Major Sir Hanbury Brown, late Inspector-General of Irrigation in Lower Egypt; "Lightning Protection," a short article by Mr. Killingsworth Hedges; and an article by Mr. F. F. Bennett, on a proposal for draining the English canals and converting them into electric railways. No doubt this is quite possible, and the idea seems rather fascinating, but it must be remembered that the great advantage of water carriage, where time is not of consequence, is its cheapness, and this economical element would of course be obliterated. We prefer to think that there is a great use for the English canal system as it is, if it were properly worked and the most made of it.

The *Antiquary* appears with a somewhat altered cover and in a somewhat enlarged form. The number includes an article on the curious sculptured font at Lapley Church, in Staffordshire; an octagonal bowl sculptured on seven of the eight sides with New Testament subjects, and noteworthy especially for the style of the sculpture, in which the figures are nearly flat and are produced by sinkings between them, leaving the relief surface of the figures as part of the original plane. Mr. C. Lynam, the writer of the article, confesses to be unable to assign a date to the font. The church dates from the early part of the XIIIth century, but there is no reason, of course why the font may not be older than the church, as is often the case. From the style of the carvings, of which illustrations are given, our impression would be that they belong to a very early period of mediæval art.

Under the title "Cyrenaica," Mr. D. G. Hogarth contributes to the *Monthly Review* a most picturesque article on Cyrene and some of its antiquities (of which there are some interesting photographs appended); an article worth reading both from the archaeological and the literary point of view. According to Mr. Hogarth, only the outer skin of Cyrene has been scratched by the archaeologist so far, and his photographs give promise of further spoil. Mr. E. Hutton writes a reflective article on Umbrian Art, which is pleasant reading, though like "Paradise Lost," it proves nothing.

The *Nineteenth Century* contains an article by Mr. F. Wedmore on Fantin and Boudin, names which it is odd to see coupled, for in England we know much of Fantin—or Fantin-Latour, as he is more generally known in catalogues, but little of Boudin. The former was for many years, in England, supposed to be only or mainly a flower-painter; Mr. Wedmore still maintains that his flower-paintings were his finest work. They are very fine, though perhaps a little too solid in style to indicate rightly the fragility of flowers; but we do not consider that their interest is as great as that of his paintings and lithographs of figure subjects.

There was one small oil-painting in a recent Salon, "Le Reveil," which was one of the most perfect pieces of art we have ever seen; and we place such work a long way above the best flower-painting. In his flower-paintings, however, there was a kind of inspiration of colour which placed them in quite a different category from such "flower-pieces" as we see, for instance, at the Society of Watercolourists' exhibitions—the birds'-nest and the primroses, and all that. He was a great artist, greater

than has been recognised as yet, in this country at least; and we hardly think that Boudin has any right to be ranked with him.

In *Scribner*, under "The Field of Art," Mr. F. Fowler writes an article on "Art-Criticism from the stand-point of the painter." He wants to know how art-criticism is to be of service to the painter. We doubt if it ever is. Painters as a rule do not care about the opinions of amateurs, because amateurs can generally tell them nothing new about technique, and that is what a painter wants, as indeed Mr. Fowler seems practically to admit. The real use of art-criticism is to the general body of the public who are interested in art; in pointing out beauties that may not be generally appreciated, and warning them against being taken in by false lights. It may be doubted whether painters care anything about art-criticism, except so far as this, that they do not like to be ignored. We doubt whether any artist has altered his style or his aims in consequence of criticism; we do not say there have not been those who would have been wise to have done so. But could they have done it if they had tried? Individual style in art is the way an artist naturally expresses himself; and he cannot go out of his own nature.

The *Century* contains one of Mr. Cole's engravings from Old Masters—a Holy Family, by Murillo, showing his usual fine and artistic treatment of line and surface in wood engraving. An article on "London Transformation," by Mr. Randall Blackshaw, is very well illustrated but rather ignorantly written. He mentions, for instance, that the London County Council, to ensure an adequate architectural effect for the buildings to occupy the newly created sites in the Strand, invited eight architects of standing to submit elevations, and called in Mr. Norman Shaw "to pass upon them" (an expression which seems to reveal the nationality of the writer); but he does not seem to be aware that the whole thing was a fiasco, and came to no result whatever. We should take it that the writer is an American visitor to London.

The *Pall Mall Magazine* contains an article by Mr. John Burns on "London—old and new," accompanied by some capital sketches by Mr. Hedley Fitton. Mr. Burns, like the man in the *Century*, mentions the competition of eight architects for the new streets, without mentioning that the competition was a failure. Perhaps, as a member of the London County Council, he did not expect to confess this. Generally speaking, we like the tone and tendency of his article, which is quite in the right direction.

In the *Cornhill*, under the title "Weighing a World," Mr. W. A. Shenstone, F.R.S., gives a very good summary, in a form intelligible to the general reader, of the means of investigation and calculation which have been employed, for two centuries past, to ascertain the weight or mass of the planet we inhabit. Some of the information may be new even to readers who take some general interest in scientific investigations. It is interesting to find, as an evidence of Newton's scientific insight, that his estimate, on rather rough data and without the refinements of the measuring instruments available in the present day, was very near to the result which the most exact modern investigation has arrived at, viz., that the mass of the earth is about 5½ times that of an equal sized globe of water.

Knowledge contains a useful article on the process of electrotyping, especially as applied to the production of medals; and Mr. W. J. S. Lockyer commences a series of articles on "Our Sun and Weather," being a systematic attempt to trace out a connexion between the state of the sun's surface and the state of the weather on our planet.

To the *Gentleman's Magazine* Mr. J. Ellard Gore contributes an article on "Early Astronomical Observations," showing that in ancient times men had their eyes more open to these subjects than is sometimes realised.

INSTITUTE PREMISES, WEST HARTLEPOOL.—On the 5th inst. Sir Christopher Furness, M.P., laid the foundation-stone of the new Church Institute, which is being erected in connexion with the Grange-road Wesley Church, West Hartlepool. The new buildings will comprise separate reading and games rooms for men and women, a lecture hall to seat 250 people, and a ladies' parlour. The estimated cost is 2,000. The architects are Mr. H. Barnes and Mr. G. H. Burton, and the contractor Mr. John Proud.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Royal Institute of British Architects was held on Monday at No. 9, Conduit-street, Regent-street, W., Mr. J. Belcher (President) in the chair.

Elections.

The following gentlemen were elected as Fellows of the Institute:—Messrs. C. H. Brodie (London), Geo. A. Humphreys (Llandudno), Wm. Thos. Lockwood (Chester), A. E. Powles (Northwich), and E. R. Eckett Sutton (Nottingham).

Deceased Members.

The decease of the following members was announced:—Messrs. A. E. Perkins (F), J. T. Wimperis (F), and A. C. Wissenden (A).

Building By-laws, Specially in Rural Districts.

The Chairman announced that the discussion on the papers read by Messrs. Lacy W. Ridge and J. S. Gibson would be resumed, and said it would be better to take the discussion first on the paper by Mr. Ridge, which dealt with building by-laws, specially in rural districts.

Mr. Lacy W. Ridge said he thought they were all pretty well agreed that something must be done with regard to these by-laws, which were exceedingly inconvenient to those who had to build in the country. The thing was to find a remedy, and the remedy he suggested in his paper was that the Local Government Board should get statutory powers from Parliament in order that they might reform the existing by-laws which at present they could not interfere with, and that the Board should itself bring out by-laws for which they would be responsible and which could be enforced by local bodies. It was impossible for that Institute, or any other body, to influence the hundreds of local councillors throughout the country, many of whom were extremely obscure persons even in their own area. They were persons they could not get at and reason with, but they could reason with the Local Government Board as the central body in London, and therefore he proposed—"That in the opinion of this meeting it is necessary that the Local Government Board should obtain Parliamentary powers to enable it to reform the by-laws in force in rural districts and in the smaller towns with a view to the enactment of such by-laws, and such by-laws only, as are really required by the public interest." Things had reached such a stage that something must be done.

Mr. E. T. Hall, in seconding the resolution, said he had suggested the substitution for "advisable" for "necessary" for he thought they could not dictate to a Government Department, but it was an alteration which did not affect the spirit of the resolution in the least degree. They were all very interested in listening to Mr. Ridge's paper at the last meeting, and he believed they were all in sympathy with the suggestions then made by Mr. Ridge. At present, as Mr. Ridge had truly put it, the rural by-laws were often such as were suitable for urban districts only, and there was no question that they retarded the building of cottages, which was a big political question, because it was concerned with the retention of the rural population on the land. If they could not house the rural population how could the people possibly stop on the land, and how could they possibly do this if landlords were required to erect houses which to return three or four per cent. would necessitate a rent of 30% a year when the rural inhabitants could only afford to pay 10% a year. Therefore, he believed the Government ought to, and would, listen with respect to views sent in from that Institute when it had for its object the erection of cottages to house rural labourers. Broadly, that was a principle with which he thought the Legislature must sympathise. All of them there were very desirous that buildings should be sound and good, and if they could afford it they would say "of the best"; but if people could not afford to live in palaces they must live in huts, and must have that which would afford a cover from wind and storm. Mr. Ridge suggested that the Local Government Board at present had no power to rescind an approval already given, and he was afraid that was so, but if they saw their way to adopt the resolution which was now moved it would enable them to recast the whole scheme and look at it from a broader point of view. With regard to the detailed suggestions which Mr. Ridge had made, there were one or two things which struck him, and which he felt would need a little

amplification or variation. For example, they did not want to deal with the local authority as if it were a hostile authority, and although they did not want to put their clients to the expense of supplying elaborate plans, yet they might meet the reasonable views of the local authority. While they should not supply drawings of the building, it would be perfectly reasonable that they should always submit with the application block plans showing where the building was to be erected. That would not put them to a great deal of trouble, and it would give the local authority reasonable information and enable them to place the site of the building on record. He thought also that Mr. Ridge had made a slight mistake with regard to factories and assembly-halls in rural districts. A factory must always be amenable to the special laws which dealt with those buildings. It was perfectly conceivable that in a village which was otherwise absolutely rural a large factory might be erected where 1,200 or 1,400 or 2,000 people might be employed. It was the practice of many trades now to go out into rural places to erect factories. He did not think, therefore, they ought to deal with the local authority in respect to factories and assembly-halls as they should deal with them in respect to cottages for the working classes. They came under a different category, and a factory should be subject to all those laws which were necessary for the protection of the operatives. The same remark applied in a different way to an assembly-hall; where an assembly-hall was erected which would contain 200 or 300 people, for instance, it was perfectly right that the local authority should have jurisdiction over the exits and fire prevention appliances attached to such buildings, and therefore in those buildings he should say it would be reasonable and desirable that owners should supply a plan showing in outline the exits and the fire appliances, etc., which were to be provided. With reference to Mr. Ridge's suggestion B that no building should be built within 20 ft. of the centre of the road except porches and such erections, he (the speaker) thought the exceptions would be a mistake. It was perfectly reasonable that there should be for the public enjoyment a clear road of 40 ft., and that there should be no porches or anything else projecting in front of that building line. On the Duchy of Lancaster Estate and Epping Forest and Enfield Chase he thought no road could be made less than 40 ft. in width, and that was a precedent which they could reasonably follow, and he suggested there should be no buildings permitted in front of the line, which Mr. Ridge had himself laid down. There were other little details he need not trouble them about. There was one with reference to the damp courses. It was a matter of detail, perhaps, but Mr. Ridge said the damp courses should be of slate. The jerry-builder might interpret that to mean one course of slates, which meant that between every joint the damp would come up. Of course, this was a detail, but if they made by-laws they must remember that there were a certain class of people who would interpret the by-laws as the maximum and not as the minimum. There were other details, such as the disconnection of pipes, which he would not have referred to except that Mr. Ridge had laid down rules. Mr. Ridge said the sink waste should discharge into the open air before it went into the drain. He thought it better to say it should discharge over a trap-gully, or else the speculating builder would put nothing of the kind, and they would have sewer gas coming into the air. There were other things which were mere details, but when they were laying down anything like an enactment—and, after all, a by-law was in the nature of an enactment—they ought to be correct even in such small details as those. They were, however, the fringe of Mr. Ridge had laid down were sound. They gave reasonable latitude to those who desired to do what, after all, was the aim and object of Mr. Ridge's scheme, and that was to enable cottages to be built. When that aim was secured, and when they had got those powers, he thought it was more than probable they would find that the great difficulty of housing the rural population would be overcome. Unnecessary restrictions which were at present put upon buildings for this particular class should be withdrawn, and everyone would benefit—the architect, the employer, and the rural labourer himself.

Mr. Ridge said the by-laws were not put

forward as complete in themselves. He had to read them as part of a paper which he desired to keep within reasonable limits, and if he had put the by-laws forward with all the little refinements necessary it would have taken a long time to read. As regarded factories, the Factory Acts were not mixed up with those by-laws, and they would remain in force. As to projections, it was not a question that the road was to be made 40 ft., but that no one was to come nearer than 20 ft. to the centre of the road. The road might be but 15 ft., and they could hardly say that a man should not have a covered way from the road. It would only remain so long as the local authority did not think proper to make the road 40 ft. wide. He had said that the powers as to dangerous buildings should be made to apply to new buildings and that would justify the inquiry which Mr. Hall suggested with regard to the exits of public buildings of any size. The local authority might fairly say, "You are putting up a building which is dangerous, and we should like to see plans." It was the demand for deposited plans which was so objectionable.

Mr. G. Bertram Bulmer (Leeds) said that this was a subject in which he felt deeply interested, and he would point out another view of the matter which would no doubt interest Mr. Ridge, Mr. Hall, and others present. He had had experience of the conditions of things where rural by-laws obtained in immediate proximity to borough by-laws. There was a class of the population whose wants and requirements had to be considered: they were the people who dwelt in the suburbs. If any alleviation of rural by-laws could be brought about it would be an advantage in enabling the borough to spread itself, because it would enable men who could just afford to build a house and no more to go just outside the borough boundary and erect a house which would meet all requirements of the rural by-laws and would not require to be controlled by the borough by-laws, because the house would be in a more isolated position. Where there was a country building standing on a considerable piece of land there was not the same danger of fire, and they could permit the erection of a building of a lighter and less expensive character than those which were necessary within borough boundaries.

Mr. S. W. Cranfield said he wished to say a word as to the undesirability of having different codes of by-laws. Mr. Hall's remarks as to factories being built in the country rather suggested that one code of by-laws would be sufficient for both rural and urban districts if they were framed and applied so as to properly differentiate between the various kinds of buildings and districts. There were many difficulties in applying one code of by-laws to a rural district and another code to an urban district. In the first place, districts were constantly changing, and it was quite conceivable that a distinctly country type of building might be desired by a landlord who resided in an urban district. He would, however, suffer by having to comply with the requirements of the district in which he lived, notwithstanding that he was building a rural cottage. He thought that one code of by-laws might be framed which would apply automatically to buildings in all districts, and that he felt was an important point. There were many defects in the by-laws, and one hardly knew where to commence and where to end. There were certain risks, such as fire, which did not as a rule vary in districts, and yet they saw in one district all sorts of requirements as to carrying party walls through the roofs; whereas no such requirements existed in other districts. It was very obvious that a fire was just as likely to break out in one suburb as in another, and in the North of England as in the South, and if it was necessary to take a party wall through the roof in one district surely it was necessary in another. His principal point, however, was that it was desirable to have one code of by-laws capable of being applied automatically to buildings of different types situated in districts where quite different conditions prevailed.

Mr. W. H. Atkin Berry hoped that in any attempt which was made to obtain a more reasonable code of by-laws they would not overlook another point, which was an important factor in the difficulties and troubles with which they had to deal, and that was the standing and qualifications of the officials who were responsible for the administration of

the by-laws. He had no hesitation in coming to the conclusion that a great deal of the difficulty and trouble which they as architects experienced emanated from the arbitrary and entirely ignorant attitude of some of those officials called surveyors. They were men in many cases of no training whatever, sometimes merely promoted road foremen, and yet these men were accepted by municipal authorities as the persons to judge architects' plans and clients' interests, and practically had the whole matter under their thumb. It seemed to him most important that while they tried to get an improved and reasonable code of by-laws they should also insist on a better class of men to administer them and advise the councils.

Mr. J. Douglass Mathews said that it was curious that in urban by-laws no notice whatever was taken of the amount of land surrounding a building. Surely if in London an open space all round a house of 30 ft. was sufficient to render the building exempt from the Building Act the same thing might apply in the country, and he thought if there was a row of half-a-dozen cottages it would not be a serious matter if they were exempt. If something of the kind was attempted in the rural districts it would save a great deal of the trouble they experienced with buildings which did not conform with the by-laws, and certainly attention might be called to it. With regard to the remarks of the last speaker, he certainly felt that officials should understand that their business was to induce building and to make things as easy as possible instead of throwing every kind of obstacle in the way of those who wished to erect dwellings.

Mr. G. A. T. Middleton said they might add to the resolution as an addendum the following words: "And, if possible, produce uniform by-laws for urban and rural districts." It had been pointed out already that there were such things as contiguous urban and rural districts, and that the relaxed conditions in the rural districts would draw much of the population from the urban districts, and before long the rural districts would in effect become urban districts, and would come properly under urban district conditions. How was that to be got over unless there was one uniform set of by-laws which automatically applied in relation to air spaces about buildings?

Mr. C. H. Brodie said he might take it that they were all in one in hoping that some real practical outcome might arise from the discussion. He hardly knew, however, how it was to be brought about except on the principle of the maxim that "hard cases made good law," and that they would have such a series of hard cases as to enable them to secure the abolition of the present by-laws, inasmuch as they were arbitrary and interfered with what the best people in the kingdom were studying to attain, viz., building for a class of people who could not pay extravagant rents. One of the chief reasons which would induce him personally to urge the Local Government Board to withdraw all the present by-laws was the action of the various authorities in preventing them from commencing their building until they had passed the plans. He was not sure altogether how that power arose. Some by-laws had it expressly stated that they should not begin until the plans were passed; while other by-laws had no such provision, but still they did prevent the commencement of a building before the plans were approved. That acted very hardly in many cases, because often the local body met but once a month, and if by accident the plans were not in by a certain date they had to delay the commencement of the building for a month. A policeman did not come along the street and arrest him because he said a month hence he might commit a theft. Such a thing would be ridiculous and absurd, and it was no less absurd as regarded the erection of a building, because the authority had always the power of coming in and stopping them if the building did not comply with the by-laws. These by-laws, or want of by-laws, also worked exceedingly hard in another way, because, to his own knowledge, local authorities refused to pass their plans although they might be in perfect accord with the by-laws, but were not in accord with the fad of some official or of certain members of that particular council. He knew a case in which an ash-pit was required to be built. Most of them very much objected to building ash-pits, but the reason for the requirement that they should build an ash-pit became evident at a later stage of the proceedings, when the local authority required

that a special way for emptying that ash-pit should be provided, and that the special means of access should be 13 ft. wide at the least, and that if the way to clear these ash-pits was more than 100 yds. long, then the passage-way should be 16 ft. wide. But this was not the end of it, because from that they proceeded to argue that the land ceased to be the individual property of each house, and that therefore they would have to go back an extra distance from the fence which was nearer to the house on the side of that 16 ft. road. This meant that the by-law which stated that a certain area had to be provided was forced up to mean that a certain area, plus the width of the 16 ft. road, had to be provided at the back of the house, and so on *ad infinitum*. The persons concerned in this particular case were desirous of going on with the building, but their solicitor advised them not to do so because he said the council would bring them before the magistrates for commencing the building before the plans were passed, and to that they would have no answer. The result of it all was that a block of nine very large shops had never been built to this day, and the rates of the particular district were suffering in consequence. It was an absolutely illegal requirement which was pressed by these people. The case was so bad that he made inquiry of an architect who had built in the town, and he told him that it took five months for him to get his plans passed by this particular authority. Cases like that placed properly before the Local Government Board would help them greatly in obtaining what they had in view.

Mr. Geo. Hubbard said there was a general impression that it was impossible to begin their building until their plans had been passed by the local authority, but he was rather doubtful whether that was so. In fact, he thought it would be found that the wording was only that the plans had to be submitted, and he did not think there was anything in the by-laws which required that the plans should be passed before the building was commenced.

A member asked if the words were not that: the plans should be deposited.

Mr. Hubbard said it might be, but he believed there was nothing about having the plans passed. Of course, if they did begin the building before the plans were passed they had to do so at their own risk, and if the building was not in accordance with the requirements of the local authority they could stop them proceeding. If, however, they came to make an unfortunate mistake, as his firm happened to make when they built a billiard-room in advance of the building line, as he described at their last meeting, the consequences were rather serious.

Mr. Bertram Bulmer said he was acquainted with a case where plans of a block of a semi-detached villas were submitted to a borough council, and they were not passed. The council declined to pass them. The architect took up the position that they complied in every particular with the by-laws, and he proceeded to build them. Those semi-detached villas were erected and were standing at the present day.

The Chairman asked if Mr. Brodie could tell them the wording of the particular by-law.

Mr. Brodie said he had not had time to study it very carefully, but so far as he could see there was no word in the by-laws which could prevent one commencing a building immediately one chose, but, as he had already said, his clients took advice upon the matter, and the solicitor they consulted advised them that if they began to build they would be summoned, and that they would have no answer to the charge. There was another peculiar thing in that same case. One drain took the drainage of four houses, and this authority required him to make that drain 9 in. He naturally thought that there had been a mistake in the typing of the letter, and he wrote and asked if that was not so. He received a reply that the drain must be 9 in., or the plan would not be passed. The whole of that was in the Borough of Kingston-upon-Thames, which they all knew was not far from the centre of the Empire. He would like the Borough Council of Kingston-upon-Thames to take his remarks seriously to heart, although he did not suppose they would. Their attitude, however, might account for the fact that Surbiton was growing at an enormous pace, whereas Kingston, judging from appearances, was doing nothing at all, and seemed to be a dying or almost a dead town.

Mr. Lacy Ridge thought they need not be

alarmed about the Local Government Board, for they knew all about it. The Local Government Board were having the subject rubbed into them, for the Institute were not the only people who were working—in fact, the Institute had been rather lethargic in the matter. The only hope he saw of getting better surveyors was to get bigger districts. There was no reason why a town of 5,000 or 6,000 inhabitants should be separated from the adjoining district. Such places were not crowded, and the restrictions which were necessary in London were not needed, and it would be better if the districts were put together and all had rural by-laws. That would very largely get over the difficulty of the country changing in character, as it did, very gradually. His outline of by-laws was to a certain extent intended to meet the transition. As to commencing to build before the plans were passed, they must remember that the architect was not doing it at his own risk. The client had the annoyance and the risk of it, and was very much inclined to think that his architect was a fool if he got him into a row with the local authority.

The resolution was then put with the substitution of the word "desirable" for "necessary," and agreed to unanimously.

Architectural Design and the London Building Act.

The meeting proceeded to discuss Mr. Gibson's paper on "Architectural Design and the London Building Act."

Mr. Gibson, in replying to the Chairman, said he had nothing to add to his paper.

Mr. W. Woodward said that Mr. Gibson's paper was of really deeper interest than Mr. Ridge's, inasmuch as it affected the metropolis. Mr. Gibson had given them useful and interesting information as to the width of streets in various Continental towns, as compared with the streets in London, but he omitted to mention Portland-place, which had a width of 120 ft., and which struck everyone as being a magnificent width, but probably because of the comparative lowness of the buildings. Northumberland-avenue was 90 ft. wide, and when the first building was erected they thought the width was sufficient, but when the hotels and the clubs were built in that avenue they became cognisant of the fact that the 90 ft. appeared to reduce itself to very much less in width. As Mr. Gibson had urged, it was not so much the width of the street as the height of the buildings which fronted the street which was important. He felt that the question of percentage of area for bricks and mortar as in New York was a very important one. Those of them who were practising in London knew that their difficulties were materially increased by the particular lines laid down by the Building Act of 1894. As regarded the open space connected with buildings, Mr. Ridge had suggested that if a certain area was given for each building the position of that area could be disregarded, and he ventured to think that if there was an uninterrupted area for light, air, and ventilation such area should be considered not with regard to its exact position but as to the extent of the area and with regard to the bricks and mortar upon the land. If that was the case, many of the difficulties which the Building Act of 1894 enforced would cease.

The matter was specially important, as they knew there was looming in the distance a Building Act Amendment Bill. He was sorry that Mr. Gibson's paper had not been deferred a little longer so that they might have discussed in connexion with it certain provisions of that marvellous and brilliant Bill which was to be enforced by the London County Council. Mr. Gibson had said that they had left it to the shopkeepers to determine the character of their street frontage. That was a subject they had had before them, and he listened with pleasure to the Chairman's presidential address in which he referred to it. The question of how much glass should be allocated to a particular building was an important question, and he had heard learned professors and eminent architects in the Institute say it was monstrous that they should erect a building in London which apparently stood on plate glass; that they should have large piers which apparently supported that which they did not support, and so on. He had, however, put this query to himself. Let them imagine one of the most eminent architects who was a member of the Royal Institute being consulted by one of the great drapers who said: "Will you have the goodness to erect a building; I can spend 200,000*l.*, but I want you to give me as much glass as possible;

I want you to carry my building safely, but I do not want any pier in the front to exceed 2 ft. 6 in.; if you do that you can be my architect, but if you will not and wish to carry on the traditions of the Institute, you will not be my architect." Let them imagine what would be the answer of this distinguished architect. He really was speaking seriously on this point, because he happened to be one of those individuals who had conformed sometimes to the requirements of the tradesman, and could only say that to the best of his ability he did provide all the pier and support he could possibly get out of his client, and when he had showed him a 2 ft. 6 in. or 2 ft. 9 in. pier he said: "Can't you do away with another 9 in.?" It was a very difficult problem, and they knew that eminent members of that Institute did manage to erect commercial buildings in London with sufficient pier to make them appear as if they were carrying something. Mr. Gibson made some reference to the use of steel work in building being recognised, and in the Amendment Bill they might devote themselves a little to that fact. In 1894 the employment of steel in London was not so prevalent as now, and they knew that the great object of architects in trying to enforce it now—he was not speaking of re-inforced concrete—was to reduce the thickness of walls. If they could employ steel and get rid of some of the thickness as scheduled in the Building Act they could with equal strength have thinner walls and would have greater space, which was an important factor in some of the commercial buildings. Mr. Gibson also raised the question of the public bodies which should be subject to the operations of Parts 6 and 7 of the Building Act, especially railway companies. Years ago, when the Act was passed, he remembered saying distinctly in the Surveyors' Institution that in his opinion no body whatever should be exempt from the operation of those particular clauses. He saw no reason whatever why railway companies should be permitted to put up such execrable buildings in total defiance of the Act with which others had to comply. He would not exempt any public body, not even the Board of Works or the London County Council. He knew that in one particular case in Drury-lane the London County Council did that which was wrong in regard to their own Act. Mr. Gibson also said that district surveyors should be practising architects. Twenty-five or thirty-five years ago that was the case, and then difficulties with architects were got over in that way, for they were assisted and helped in every way, because the surveyors who had to superintend the works under the Act before 1894 had been practising architects and knew all the difficulties and trials connected with building in London, and without any derogation from their public duties or any detriment to the public interest they were able to assist architects in getting buildings completed with thorough satisfaction and in accordance with the requirements. He hoped that the Institute would insist as far as it could, with reference to the new Bill, that the district surveyors should be as far as possible be practising architects. They had to contend now with district surveyors who had had no practice whatever and they had had to deal with that narrow-mindedness and fadism which permeated almost every official in this country. He trusted that the Institute would do its best to secure that district surveyors in future should not be so much as they were at present under the thumb of Spring Gardens, but should be independent gentlemen, able to administer the Act which was before them and able to assist to the best of their ability the works which architects had to carry out.

Mr. Bernard Dicksee said that as a district surveyor he might be allowed to say a few words. Regarding the question of open space in the rear of buildings he had always felt that the Act of 1894 was totally inadequate to provide the necessary open space for the very good reason that it provided it in the wrong place. It required the open space at the rear of the building for the full width of the building. There were hundreds of buildings in his district where there was not a single window that obtained its light from that open space. He referred particularly to small buildings put up mostly for the working classes, planned with a room front and back and a rather long back addition. To provide that open space at the rear of the building (which was no use at all) they were obliged to drive the back additions of these buildings closer together, and so stive up the open space provided for

lighting the windows that it was of very little use. The Science Committee drew up what he thought were some very good suggestions as to open space, but he was afraid they went no further than the Council. These were based to a certain extent on the New York and Philadelphia provisions. It was suggested that there should be an open space equivalent to a certain fraction or area of the whole site, to be disposed in such a manner as to afford a proper means of light and air for the various windows. That would require the district surveyor to say if he did not think the space provided a sufficient amount of light and air, the matter would go before the magistrate in the ordinary way, and the surveyor would have to prove his case. There were certain other suggestions made as to the height of buildings so as to allow cross currents, but these were details. The main principle was that the open space should be elastic, not so much in size as in position. It was no use putting an open space where the windows were not; and at the present time in these small class of buildings the open space required by the statute was not used for the purpose for which it was intended. The next question was that of steel construction, and the Institute sent up a very good set of suggestions to the London County Council for their new Bill. The County Council in their wisdom or otherwise did not propose to insert these in the Bill at all, but to take to themselves power to make regulations for steel construction. These would not be by-laws but regulations. If they were by-laws they would have to be subject to the provisions of the Act, and would have to come before that Institute and half-a-dozen other bodies, and have to be approved by the Local Government Board after hearing any opposition they or others might choose to put in against them. By using the word "regulations," however, in this new Bill all that machinery was waved on one side with a high hand, and these regulations, if they were made, would be made by the London County Council of their own bat, and the architects would have to carry them as best they could. That was the point to which he thought the Institute should pay very particular attention. He was afraid they were to a certain extent to blame because they had tacked on to the end of their suggestions that it would be better to have them in the form of by-laws so that they might be altered without a fresh Act of Parliament. His view was that they should form part of the Act, even if there was power given to the London County Council to make some variations if they found it necessary. As to Mr. Woodward's attack on the district surveyor, he was sorry that in some cases there was a certain amount of truth in his complaint. His own view was that the district surveyor was not intended to obstruct building, but to assist it. The district surveyor had certain requirements to carry out, and to that extent he was tied and could not help himself, but there were different ways of carrying out the Act, and he thought that if the district surveyor could show an architect how the Act might be complied with when he was erecting his building he would be morally bound to adopt that course. As a district surveyor he wished to fully endorse Mr. Woodward's and Mr. Gibson's suggestion that the Institute should insist to the utmost of its power that the district surveyor should be a practising architect. He was in the position of having to give up his practice when he became a district surveyor, and he was bound to admit that the want of practice did not assist him in his work, and he was obliged to do all he could to keep himself abreast of the times. If the Institute did not move very considerably at the present time matters would go from bad to worse. The County Council made a mistake ten or twelve years ago in making the district surveyors sign their conditions before they accepted them as candidates. Now, after twelve years, this Bill contained provisions—and he hoped the Bill would never become an Act—which would destroy the independence of the district surveyor absolutely. The County Council proposed, in the first place, to exempt all their own buildings from the Act, and so remove any control of the district surveyor over them. They also proposed to take power to alter the title of the district surveyors to anything they thought fit, and they proposed to make provisions with regard to the payment of district surveyors, and also to take action in lieu of the district surveyor, so that they

might walk right over the heads of the surveyor. In fact, the result would be that district surveyors would be at the end of the string from Spring Gardens. He hoped the Institute would do the best it could for the district surveyors in this case, and in doing that they would be doing the best for themselves and for the public. It was of the utmost importance that a district surveyor should be a man who was entirely independent of Spring Gardens, and who should be capable of carrying out his duties without fear or favour. They were not at the present moment, as Mr. Woodward said, under the thumb of Spring Gardens. They were not officers of the County Council, but if that Bill passed into law as proposed he was afraid they would be. The proper solution was to assimilate the country laws to London laws, and not assimilate London laws to country laws. There was another point he would like to touch upon which he did not think Mr. Gibson really dealt with. It was the importance of the provisions for frontage lines in respect of architectural effect. There was nothing more deadly dull than a uniform frontage. The present Building Act dealt with the general line of buildings—it did not deal with building lines at all. It had been held that the present law only applied to the existing line of existing buildings. The decisions of Barlow v. Kensington Vestry of the London County Council v. Cross, and of Allen v. the London County Council, all laid down that the line mentioned in section 22 of the London Building Act must be the existing line of existing buildings. In the House of Lords, in the Kensington case, it was decided that the line did not extend beyond the last building. That had not been the practice in administration of recent years. The practice adopted largely at Spring Gardens, and also by some district surveyors, was that the line extended all along the street. He did not know how many buildings would constitute a general line of buildings, but he should imagine three. He could imagine a street in which the building owner could have started the building close up to the footway. Perhaps he elected to set the building back 20 ft. and to put bays to the windows standing out 5 ft. When he had put up three houses, was the district surveyor or County Council to come along and say: "You have set up a building line; you must continue that line right through." If that was the case, to get his 5 ft. bays he would have to set his next three houses back, and at once there was another building line, and so it might go on right down the street, and they would have a series of receding houses all along the street. It had often occurred to him that the Institute might do some good in trying to introduce into future legislation some provisions for a building frontage distinct from the general line of buildings. He thought particularly in the case of such buildings as they had round the parks and such as existed to a large extent in the city of Bath, where they had a projecting centre and two projecting wings, the law as at present interpreted in London would be awkward. His suggestion was that where it was proposed to build a block of buildings of that description the owner should be entitled to bring to the district surveyor the block plan of what he proposed to do. Having brought that plan to the district surveyor, and deposited it with him, he should be entitled to carry out that scheme, and no arbitrary question of building line should come and cut off his corner block. Perhaps the Institute would see whether in this new Bill they could get some such provision as that inserted, for it seemed to him of the highest importance to architecture.

Mr. Edwin T. Hall said the subject which Mr. Gibson had brought before the meeting was of the very greatest interest, because they all knew of the Building Bill which the London County Council was about to submit to Parliament. He hoped that the Practice Committee would exercise the greatest vigilance in watching and studying the new Bill as soon as it was in print. Most of them had seen a synopsis, and he noticed that there were some radical changes proposed, which would be inimical to the interests of architecture in London, and would accentuate the great difficulties with which they had already to contend. He would like especially to draw attention to one radical change which was proposed in the Bill, and that was in the constitution of the Tribunal of Appeal. It was proposed, among other things,

that the architectural member of that tribunal should not on any pretence be an architect practising in London. He might be a doctrinaire or literary architect if he was not in practice, and might be an architect practising in Liverpool or Glasgow, but he must not be an architect practising in London. He could not imagine a more inconvenient and troublesome provision than that would be in an Act of Parliament for this vast metropolis, which was a province equal to some ten or a dozen of the largest cities in the Kingdom. In dealing with Mr. Gibson's paper, he wished first of all to refer to the suggestions as regarded the width of streets. They must be careful in enacting the minimum width of a street not to go from the frying-pan into the fire. One of the provisions of the proposed Bill meant that instead of being allowed to build within 20 ft. of the centre of the road, they should not, without the consent of the London County Council, build within 35 ft. of the centre of any road. At present in the synopsis there was no suggestion that anybody was to be compensated. They could just imagine what that meant if a house was pulled down and had to be set back. In miles of streets in London it would simply mean confiscating the whole of the property, because in many business thoroughfares the plots were not of a greater depth than that. He thoroughly agreed with Mr. Gibson that there should be an increase in the width of streets. Even in the near suburbs of London he thought there should be a minimum for main streets and also for cross streets—those likely to become important thoroughfares from east to west or north to south, and crossing places also. Those streets should be made a minimum of 60 ft. He thought it would be greatly to the benefit of suburbs if in the laying out of new estates roads were made 50 ft. wide instead of 40 ft. That was not an unreasonable requirement, and, personally, when he had had to lay out estates near London, he had made the roads 50 ft. wide, because he thought it was wiser in the interests of the estates even although to some extent it did affect the ground rents derived from the property. Beyond that he did not think they should go. Mr. Gibson suggested that there should be 70 ft. roads, but for suburban streets he suggested that that was excessive. It meant an immense capital outlay and a large charge for maintenance; the latter had to come out of the rates. If a street was unnecessarily wide it was wasteful, for it did no good whatever. A road 50 ft. wide gave a good wind current and provided plenty of sunshine for the houses on both sides, and, therefore, they must not in their desire to improve aeration go too far. There was also the difficulty of crossing, because where they made an excessively wide street they must also make havens or they would create difficulties for the pedestrian traffic. In London itself he thought there should be power, with proper compensation to owners, to make main streets up to 100 ft. wide. Beyond that he did not think power should be given. He believed that 100 ft. was a width very amenable for traffic, and with streets of 100 ft. they would be able to make the Metropolis very fine. He believed Mr. Gibson went so far as to say that there should be a general rebuilding of the streets of London. That was a counsel of perfection, but had he realised what it would cost in money? Take Cheapside. He supposed he would be within the mark in saying that it would cost 100,000,000. At least to widen Cheapside to a width of 100 ft. They must be practicable, and it was no good their making suggestions which were impracticable. Were they to lay before the ratepayers any such suggestions for re-alignment, it would involve London in a cost equal to the National Debt. References had been made as to the height being made to vary with the width of the frontage of the building. He did not think they need trouble their heads about that in London. If that were done it would make the streets look "higgledy-piggledy."

Mr. Gibson said that under the present Act the owner of a building was allowed to erect the front of his building to his own ideas, so that there was no continuity of design. If under the new Act a greater height than 70 ft. was allowed for the purpose of obtaining architectural uniformity in narrow frontages, there should be powers given to enable contiguous owners to collaborate on the design.

Mr. Edwin T. Hall said that any two owners

could do that now, and constantly did it. No Act of Parliament was required to enable two owners to agree. With reference to the heights of buildings, although he agreed with increasing the width of the streets, he did not think that the limit of the present Building Act was an unreasonable one for a city like London, where not only was property of great value, but the necessity of being within a given area was so important to men of business. When they came to think that New York permitted a building of 100 ft. and 150 ft. in height, why should they consider that their height in London was unreasonable? With reference to the railway companies, he thought the public ought to make a strong protest against their being exempt from the operations of the Building Act. Their railway stations, with one or two exceptions, were a disgrace to London. Let them take Victoria Station, which at the present time was being rebuilt. For years and years the owners had paid a dividend of 10 per cent. and yet the station gave foreigners a most disgraceful idea of the architecture of London on their arrival in the capital. A more miserable building they could not see. Let them compare it with some of the fine Continental stations—say, the station at Frankfurt-on-the-Main, which cost $\frac{1}{2}$ millions of money to build, and had 19 parallel platforms, with an ante platform 100 ft. in width, on which he should think they could put five battalions of soldiers. In that station they found everything complete for their comfort and luxury. Why could they not impress on their railway companies the obligation that they should build respectable stations for the credit of the city? He thought it should be compulsory on them to be amenable at all events to the Building Act. As to the difficulty of the glass frontages, Mr. Woodward had put a question, and he did not think many of them would have the courage to decline the work if it was offered to them. But London was not very shocking in this respect. Some years ago he put up a block of buildings, and had built piers, but the tradesman covered the piers with glass showcases. In Frankfurt there was a building with a frontage of glass from the top to the bottom. Although they might cavil and object, he did not see how they could coerce the private owner to build architecturally when he said that his first business was to do that which would bring him income, or else he would not spend his money on building. He could not imagine how the Legislature could insist upon it. With reference to the architectural treatment of streets, there again some difficulty occurred. They all liked to see their streets noble in design, but they must not forget that most of the improvement in London had been made by its individualism, and had resulted from that quality which made England so great. He trusted that the Institute would impress upon the Practice Committee the necessity of watching this new Bill. It was a Bill of the most drastic character.

Mr. Woodward said that with regard to the Tribunal of Appeal it had been brought before the Parliamentary Committee of the London County Council, and they were asked if they would withdraw that particular section, and they said "No, we intend to insist upon it."

Mr. Hudson said that at all events they had that evening settled a question which came up perennially before owners of frontages, and now any member of the Institute could feel at liberty to erect a building which was apparently supported on plateglass.

Mr. Hall: You must do your best to prevent it.

Mr. Hudson said that he quite agreed. With regard to the height of buildings they had had a good deal of adverse remarks with regard to the drastic reforms of the London County Council, but he thought they were indebted to that body in some respects, especially in the case of the new thoroughfare, where they had, to a certain extent, limited the height of the buildings. At any rate, the London County Council had prevented an American syndicate putting up what he thought would have been a horrible monstrosity. In that connection he thought they were greatly indebted to the Council for nothing could have been more terrible than to have had Somerset House and the churches in the Strand dwarfed and crushed by such a frightful thing as they saw on entering New York harbour. Mr. Dicksee had referred to the open space, but he was afraid that was

a thing it would be very difficult to alter, because in such neighbourhoods as he had spoken of, where the frontages were very narrow, a great portion of the accommodation of the houses came into the back additions, and when they put them back to back, he failed to see how they could possibly have a large space for air and light in between those back additions. Therefore, he thought they had better accept the lesser of the two evils, and be content, as a rule, to have the space at the back because they must remember it benefited the adjoining rows of houses which came upon them. He was afraid the only thing they could do was to prevent the windows of one house staring right into the windows of another. With regard to the district surveyors, he did not know that it would be possible for them to attend to their increased duties in London if they had a large practice themselves. He believed in the old times a district surveyor could not practice in his own district, but what he did was to get a brother district surveyor to father his schemes in his district, and he did the same for his brother district surveyor in an adjoining one. He felt that it would be very difficult to carry out the particular Acts, as they did them now, if the district surveyor was in private practice, but he hoped they would be able to satisfy the London County Council that that could be done.

Mr. H. H. Langston said he would like to refer to the matter of *Robins v. Goddard*. It was in the matter of the conditions of contracts.

The Chairman said he did not think that was a subject which should come into the discussion; at all events, they must allow the discussion to proceed first. The matter Mr. Langston referred to was being considered.

Mr. Brodie said he would like to break a lance in favour of the exemption of some of the great corporations from the provisions of the Building Act. He was surprised to hear Mr. Gibson, who was a thorough Scotchman, say something which was illogical. Mr. Gibson objected to these corporations being exempted, but, at the same time, in his paper he put in the strongest plea for the use of reinforced concrete. Had it not been for the exemption of these great corporations who were not under the provisions of the Building Act, reinforced concrete could never have been brought into the county of London. It was only the railway companies who had been able to provide the architect with the sight of a building constructed entirely in reinforced concrete in its proper thickness.

Mr. Dicksee said that the buildings put up by railway companies in which reinforced concrete was used could be put up by anybody else in exactly the same way. In Southwark a railway company had put up warehouses, but any architect could do the same thing by complying with the conditions of the London Building Act as to the thickness of walls. It was only for railway buildings proper that the railway companies were exempt.

Mr. Brodie said that as a matter of fact railway companies could build within their own area any building they liked. They could put up a timber building if they liked, and he thought that Mr. Dicksee's correction rather failed.

Mr. Gibson said that he prefaced his paper with the remark that the whole of it was concerned with the artistic view of the Building Act—that was, he only took up that portion of the Act which they as architects with some sympathy with architectural art were chiefly concerned with. He did not concern himself with construction as construction; only so far as it had a direct bearing upon the artistic effect of the design of a building. His object in reading that paper was twofold. In the first place he wanted to point out so far as he could all those portions of the Act of 1894 which, in his view, were not conducive to the artistic development of architecture, so that in any action which that Institute might take, and he hoped it would take a very strong action, those defects might be removed in any future enactment. Coming in detail to the criticisms passed that night, Mr. Woodward brought to his notice the fine width of Portland-place and the comparatively narrow width of Northumberland-avenue. That enabled him to bring his main point before them, which was that the width of streets was relative to the height of buildings. He thought they would agree with him that, with regard to the roads in a radius of a mile and a half from St. Paul's, it was

desirable that owners of property should be allowed to erect buildings of a greater height relative to the width of the street than they ought to be allowed at a greater distance from St. Paul's. He divided the town into three zones. The first had a one and a half mile radius from St. Paul's, and was three miles across, and he laid it down that within that area buildings could be erected to a greater height than the width of the street. He thought that in business areas streets 100 ft. wide were necessary. The Kingsway was 100 ft. wide, and was in itself proof that streets of 100 ft. were necessary within the commercial centre of London. If they built such streets in the commercial centre of London it was quite right and proper that buildings higher than the widths of the street should be admitted. The maximum height he advised was 125 ft. Outside that area came another radius of another $\frac{1}{2}$ miles, and within this area buildings should not be allowed under any circumstances to be higher than the width of the streets. Outside that area again, beyond the three miles radius of St. Paul's, no buildings should be as high as the width of the streets. The result would be that you would secure more aeration as they got from the centre. Further, the difficulties of acquiring property to widen streets would be very much less, because they would not have buildings so congested as now under the present Act. At the present time it appeared to him that the chief defect of the whole Act was this—that they made one regulation which they fondly imagined would apply to all circumstances. Then as to the question of re-alignment, and what he might term the most perfect alignment, within the commercial centre of London. Whether it would cost 100,000,000, or not to widen Champs-Élysées was entirely outside the question. Whatever it cost it would have to be done. At the present moment the difficulty of dealing with public improvements was this—that there was no scheme or method. They chopped off a bit of Champs-Élysées because as it happened a few buses stopped there, and they chopped off a little bit on the south side of Piccadilly, and they would go on chopping and chopping and chopping, and never have any scheme to deal with the matter as a whole. Whatever amount of money this might cost them from the point of view of capital expenditure—and all that they had heard was merely guesswork on that point—the cost to the community now was immeasurably greater, and they knew it every day of their life. Let them take a cab and go from Holborn to the Bank between nine and eleven. (A voice: 'Why not take the Tube?') He thought it was an unfortunate thing that they had been compelled for that very reason to build tubes. The cost to the community by reason of the congestion of traffic in all those main streets was, in his view, immeasurably greater than any capital cost which it would take to work out the whole re-alignment of the commercial centre of London. With respect to steel construction, he joined issue with Mr. Brodie that it was only through the exemption of railway companies that they were enabled to see something of re-inforced concrete. The question of steel construction and re-inforced concrete were questions which in the very nature of things it was necessary for the County Council to deal with. Steel construction was known and used largely, and more experience was obtained in the use of it in America long before the time of the framing and passing of the Act of 1894; but it appeared that it was absolutely necessary to have enormous fires to bring it home to the wisdom of the officials of Spring Gardens that steel construction, properly applied, was a safe and sound form of building construction. The illogical position was that of the London County Council, which made no provision for any other form of construction than that of buildings of bricks, stone, and similar materials. They provided for no advancement and no new materials which might be discovered or used. His point with regard to steel construction was a different one. His point was this—that the very adoption of steel construction altered the whole complexion of the requirements of the Act dealing with the relative areas of solids and voids. That was the whole point. What were they doing at the Ritz Hotel, in Piccadilly? They were practically putting up a steel building and covering it with granite and stone and brick, for no apparent purpose except to comply with the Building Act. It was absolutely monstrous, and no public authority ought to be permitted

to continue to enforce by-laws of that nature, which were practically obsolete. The strongest point upon which he thought the Institute should concentrate its efforts was that of retaining the services of the district surveyors, who were practising architects, and they should do everything they could to lessen red tape and mere officialism. If they did that they would go a long way towards getting better architecture, more freedom to work, and the public would in no way suffer.

The Chairman said the only point he would refer to was the overcrowding of the suburbs, which was increasing to a very alarming extent. He believed that expansion of the tramway system was causing the increase of small properties. People having houses with a few acres were going further out, and the land was promptly taken up by the speculating builder, and crowded with as small houses as he could get on the land. That was a growing evil, and something should be done. He felt as they got out the lower should be the houses, so that they could get as much air drawn towards the centre as possible. They had had a number of very valuable suggestions, and he thought they would be of great assistance to the Practising Committee in dealing with the matter at the proper time.

Mr. Douglass Mathews said the Committee was considering the Bill of the London County Council, and the suggestions made would be urged at the proper time.

The Chairman announced that the next meeting would be held on January 23, when the Council's award of prizes and studentships would be made, and a paper would be read by Mr. James Ransome on "European Architecture in India."

Fifty Years Ago.

THE PRESENT POSITION OF ARCHITECTURE.—To such a mechanical routine position is this noble art reduced. No inducement is held out for real thought and composition. The designer, if designer he can be termed, is fettered beforehand; he is actually tempted and encouraged to remain stationary, and content himself with the system of transcription which prevails. If it be true, as Forsyth says, that "deep learning is generally the grave of taste," certainly the modern architect is compelled to bury under a knowledge of the details of other styles, whatever taste for original composition and appropriate indigenous ornamentation, the germs of which he may chance to possess. His reputation must be based, not on his own excellence, but on that of others. He is not called upon to think for himself; his merit lies wholly in the ability to select with care and taste the best features from approved ancient examples; not to look into his own mind for inspiration, but to endeavour to approach as near as possible to the feelings which dictated the ancient fabrics, without considering whether the spirit which prompted their peculiarities should prevail in our own days. * * *

Instances there unquestionably are of men of ability, men who evidently think for themselves, and whose brilliant genius compels us to believe in the still present power and vitality of the art, and that it may be roused from its dormant position.

But we cannot in fairness look to the profession, whose living, whose very existence, is dependent on the favour of their clients, for a complete remedy of the evils stated. The general public have it fully in their power to "reform it altogether." They are to blame, and from them must come the impetus which is to rescue the art from its present depressed position. Let them, with more enlarged and comprehensive views, determine no longer to be contented with counterfeits and imitations. Let them institute an experimental competition, and not be discouraged by the first result, but see whether repeated efforts do not tend towards the full and perfect development of a new and superior style of art. Let them, remembering that even the reptile does not endeavour to clothe itself again in its cast-off skin, resolve to reject all designs evidently and professedly copied from antique and other exemplars. Let them no longer encourage the erection of structures which shall be but as the shadows of past ages, aping ancient institutions, and serving only to remind us of this or of that nation's palmy greatness. Let them demand an indigenous style, which shall rise at once out of the peculiar circum-

stances of modern days. Let them demand edifices which shall appear the works of Britons of the nineteenth century, and not the compositions of Egyptians, of Greeks, of Middle Age architects, and of Moors, oftentimes in the last stage of their dotage. Let them do this, and they may confidently trust that architects will nobly respond to the call, will prove themselves equal to the crisis, and demonstrate that theirs is not the art which is fated for ever to stand still.—*The Builder*, January 13, 1855.

Illustrations.

CHURCH OF NEUFCHÂTEL-EN-BRAY.



THESE drawings, made by Mr. J. Tavernor-Perry, are described in the article by him in another column.

RUSKIN HOUSE, ROCHESTER ROW.

This building, which is on a plot of ground running through from one street to another, is arranged for the manufacture of glazing and casements and decorative metal work, etc.

It consists of front and back blocks with a narrow intermediate block. The smiths' shop is in the basement, the offices and show-room are on the ground floor, and the upper floors are workshops. The front is treated in oak, rough-cast, and Kentish hand-made tiles, with Dutch tiles on the face of the ground floor bays.

The builder was Mr. A. J. Bateman, of Ramsey, Hunts, and the architect Mr. Arthur Keen.

BROMLEY MUNICIPAL BUILDINGS COMPETITION.

FIRST PREMIAED DESIGN.

WE give this week the elevation and two plans, to a pretty large scale, of the design by Mr. R. F. Atkinson, of London, to which was awarded the first premium in the competition for New Municipal Buildings at Bromley.

The following quotations from the author's Report, sent in with the design, explain his intentions in it:

"In designing these buildings I have adopted the 'Free Georgian Style,' of a simple yet dignified character, in keeping with the quaint surroundings of Bromley."

"The municipal portion is planned on the Treadwell road front, while the courts are placed in the rear opposite the proposed police-station, so that easy underground communication can be made for prisoners in the future."

"The borough accountant's department is placed directly opposite the principal entrance, that the public may have easy access thereto; the strong room for this department is placed on this side, opening off the general office, being more convenient than in the basement."

"The sanitary inspector's department is placed on the extreme left, having a separate entrance; a small room is provided for disinfectants on this floor, the principal store-room being placed in the basement."

"The borough engineer's department is placed to the right, with separate entrance for the building inspector; the rooms not required on this floor being placed in the basement, easily accessible from the department."

"The education department is placed in the right wing, the committee-room with waiting-room for parents adjoining being so arranged as to serve as a small court, with ante-room for magistrates when required; ample staff toilet accommodation is provided on this floor."

"The county buildings are arranged with central entrance and large *salle d'attente*, off which are arranged the witness-rooms, with toilets, solicitor's robing-room, and the courts, with a connexion to corridor of municipal buildings. A separate entrance is provided for the magistrates, giving access to their private corridor, off which are arranged the justice's room, justice's clerk's room, registrar's room, with lavatory accommodation for justices and officials."

"The county and magistrate's court is placed at one end of the *salle d'attente*, with entrance thereto from those in attendance, entrance for justices from private corridor, and entrance direct from outside for the public to gallery; a separate entrance is arranged for prisoners down to prisoners' room in basement, with stairs to dock, and provision for subway to future police-station."

"The small court is placed at the other end of the *salle d'attente*, and having entrance therefrom, also separate entrance for justices through an ante-room."

"An entrance is also provided for the public from the street; this court with ante and lavatory named, is so arranged as to be used for the committee-room of the education department, with waiting-room for parents when not used for court purposes."

"On the first floor is placed the council chamber, situated so as to be away from all noise of the streets. At one end are placed the two committee-rooms, with ante-room and committee meeting, and robing-room centrally placed between them, and with ample toilet accommodation. The mayor's parlour is placed on the other offices, are placed on this floor."

"Materials.—The external fronts would be faced with Lawrence or Poulton's hand-made facing bricks. Six courses to the foot, with dressings of Monk's Park Bath-stone, the area facings being of Tunbur Cream facings bricks. The roofs covered with green Tiber tiles. Floors formed of asphalt on concrete. All floors of steel and concrete on the Columbian system.

laid with Hopton stone mosaic and wood, as required for the various positions. The windows, filled in with wood frames, iron casements, and glazed with leaded lattice with broad leads. The walls and ceiling would be in plaster of a simple character, but the hall and corridors would be treated in French or other plaster, in the same cases as the windows would be of Hopton wood stone, walnut, marble, mosaic, or tiles. Where no lights are used there would be an outer skylight, with an inner counter light, glazed with obscure glass."

"The plumbing and drainage would be of the best and most approved system, perfectly sanitary—every part well ventilated, and cut off by disconnectors from the sewer. A service of water would be provided from the company's main, and hot water supplied to all lavatories."

"Heating, lighting, and ventilation.—The building throughout would be heated on the low-pressure hot-water system, with ventilating radiators, all under count and worked from boilers in the basement, and by fresh air passing through these radiators, warm fresh air in winter, and cool fresh air in summer is admitted. Special inlet and outlet ventilators being also provided to take off the foul air, worked by electric fans, special attention being given to the courts and council chamber."

"The whole of the building would be lighted by electricity, taking the supply from the company's main."

ENGINEERING SOCIETIES.

JUNIOR INSTITUTION OF ENGINEERS.—A large number of members of this Institution availed themselves of the opportunity for visiting, on Saturday, the 7th inst., the Albert Works of the Voelker Incandescent Mantle Company, at South-street, Wandsworth. The works were kept specially running for the benefit of the visitors, and all the processes of manufacture were seen—the winding of the ramie thread off the spools as received at the works on to reels for the weaving machines—the weaving of the thread into fabric of continuous tube formation, treatment by means of chemicals to thoroughly cleanse the fabric, cutting into lengths according to the size of mantle required, sewing on of the strengthening end piece, impregnating with thorium through small roller machines, drying, seasoning, collodionising, trimming, and boxing. The works give employment to about 400 hands, and the total output is 30,000 mantles per day.

METROPOLITAN ASYLUMS BOARD.

THE Managers of the Metropolitan Asylum District resumed their sittings on Saturday last week at the offices on the Victoria Embankment.

Among the correspondence received from the Local Government Board were letters authorising the following works:—Internal painting work at Joyce Green Hospital without first advertising for tenders (estimated expenditure, 7,000*l.*); additional work in connection with the construction of a new position at Long Reach (estimated expenditure, 694*l.*); and an extension of the existing accommodation for coal and coke at the North-Western Hospital (estimated expenditure, 105*l.*). The Local Government Board also wrote sanctioning the plan of the additional means of access to the highways at the Brook Hospital, the cost of which is estimated to be 375*l.*; approving the proposal to enter into a contract with Messrs. J. & E. Hall for the installation of a refrigerating apparatus for the cold storage of anti-toxic serum, at the sum of 400*l.*, without first advertising for tenders; and forwarding copies of an order authorising the erection of additional buildings at Tooting Bec Asylum, at a cost of 36,250*l.*, and the borrowing of that amount.

Cleaning and Painting Works.—It was agreed to apply to the Local Government Board to suspend for six months the operation of article 17 of the Poor Law Board's Order, dated June 18, 1867, and of the Local Government Board's Order, dated November 18, 1884, amending the same so as to enable the Managers to accept tenders for painters' materials which may be required in connection with the annual cleaning and painting works to be carried out by direct labour without in the first instance advertising for sealed tenders.

Park Hospital.—It was reported that the actual cost on completion of this hospital had been 251,711*l.* 10*s.* 10*d.* The architect was Mr. Edwin T. Hall, the contractors Messrs. Leslie & Co., Ltd., and the clerk of works Mr. A. Turner.

CLOTH FAIR, WEST SMITHFIELD.—The old house, constructed of wood and plaster, which fell into ruin in the night of December 22, was locally known as "The Cottage." It was No. 1, Back-court, Cloth Fair, consisting of three rooms, and the north side of the church of St. Bartholomew the Great, and to all appearances formed one of the most ancient of the old houses which still remain in that quarter.

THE ARCHITECTURAL ASSOCIATION.

An ordinary general meeting of this Association was held on Friday evening last week in the new premises at Tufon-street, Westminster, S.W., Mr. E. Guy Dawber, President, in the chair.

The minutes of the last meeting having been read and confirmed, and some nominations read, the President announced that the following members had re-joined, *i.e.*, Messrs. H. C. Chevalier and F. C. Moscrop-Young.

The Building Fund.

The President also announced the following further donations to the Building Fund:—

	£	s.		£	s.
John Bolding	5	0	Reade, Reilly,	2	2
Sons, Ltd.	10	10	Jackson	2	2
W. Flochart	10	10	Joseph Swarbrick	2	2
W. H. Brierley	5	0	R. Douglas Wells	2	2
Thos. Pado & Co.,	5	0	Woolfall & Eccles	2	2
Ltd.	5	0	E. A. Agutter	1	1
J. Simpson & Son	5	0	H. O. Creswell	1	1
Sir G. A. Nicholson	5	0	H. G. Gamble	1	1
Bart.	5	0	Ham Hill & Douling	1	1
A. Mayson Watson	3	0	Stone Co., Ltd.	1	1
T. C. Yates	3	0	Nathaniel Hitch	1	1
F. Lohman	3	0	A. P. Lambert	1	1
Perivall Currey	2	2	E. Godfrey Page	1	1
G. B. Bulmer	2	2	P. J. Osborne Smith	1	1
Henry Martin	2	2	B. D. Tracy	1	1
Musellwhite & Sapp	2	2	H. Hughes	1	0

On the motion of Mr. Louis Ambler, Hon. Secretary, the following votes of thanks were heartily agreed to, *i.e.*, to Mr. Alan Potter for kind donation of a set of "Italian Photographs"; to Mr. W. G. B. Lewis for donation of a copy of the London Post-Office Directory for 1905 and to Marmor, Ltd., for donations of samples of "Pentelikon marble."

He also announced the following donations to the Library, *i.e.*, a pamphlet on "Public Health and Architecture," by Dr. Sykes, presented by the author; "Architects' Law Reports," Vol. I, by Mr. Arthur Crow, presented by the author. A vote of thanks to the donors was accorded.

Public Libraries.

Mr. Alfred Cox then read the following paper on "Public Libraries."

The building and arrangements of public libraries, which is the subject of my paper to-night, is a very interesting one, embracing as it does all sorts and conditions of buildings, from the medium-sized, ordinary free public library to the magnificent buildings of our own country, and those of France, America, and Germany, in which are housed the libraries of more national character—such as that within the British Museum, the National Library of Ireland, the National Library, Paris, together with the well-known examples in Boston, New York, and Washington.

In speaking on this subject to-night, I do not propose to deal with the history of libraries prior to the passing of the Act, nor shall I discuss the general advantages of education which the passing of that Act brought about. This is all very interesting in its way, but I think, as far as we are concerned, our interest is principally in the buildings themselves. And in dealing with these buildings I shall confine my attention more chiefly to the smaller class of library building, generally adopted by the various towns in this country, and which would probably be erected for sums varying from 2,000l. to 10,000l.

As you are aware, there have been several useful books written on libraries, and papers have been read from time to time both here and at the Royal Institute of British Architects on this subject, so that I do not know that I can add very much to the excellent information contained in them, but I shall endeavour to point out the uses to which the various rooms can be put, and their suitable position within the building in relation to one another. During the last few years there has been a great deal of architectural work brought about by the erection of public libraries of this type, and many towns that otherwise could not do so have been enabled to do so to their public buildings in this way, owing to the generosity of certain individuals, among whom may be mentioned more particularly Mr. Andrew Carnegie, Mr. Passmore Edwards, and the late Mr. Henry Tate, all of whom have given large sums of money for the purpose. The plans of these buildings, many of which have been published in our professional papers, show various ways of dealing with the peculiarities of site, and the official requirements necessary, at the same time having due regard to the sum of money to be expended. In the first place, it is of the greatest importance that a suitable site

should be provided for; on this almost entirely depends the satisfactory planning and general economical arrangements of the building to be erected on it. It should, of course, have good light around it, and also be in as central and yet as quiet a position as it is possible to obtain. It should be large enough to allow of any probable future extension of the building to a reasonable degree; but in the case of suburban towns, which spring up like mushrooms, and develop at a rate far beyond the most careful calculations, the best solution of this problem will possibly be by means of small branch libraries erected in suitable positions. With regard to the general arrangements of the plan, these should, of course, like any other building aiming at satisfactory results, be very simple, and, if possible, all the public rooms arranged on one floor. This, however, often cannot be done, owing to the limitations of the site, and in such cases more public rooms to which most easy and ready access is required, such as the news room and the lending department, should be placed on the ground floor, and the less-frequented rooms, and those for special study, together with the librarian's office, on the upper floors. Supervision is of the first importance, and in planning should be always borne in mind, and it is usual to arrange for this by placing the staff-counter or enclosure connected with the lending department in such a position that the attendants, who are generally at work there the whole day long, can command the main entrance, and as many of the rooms as possible. In connexion with this it is a mistake to conclude that the librarian is the policeman of the building, his work being of far greater importance than that, although probably in very small libraries he may have to do all the work, with possibly the assistance of a youth. He should be in a position near to his assistants, but it is not necessary to place his room in a prominent position as regards the public. All the public rooms should be lofty and well-lighted; the ventilation should be especially considered, so that the air can be changed frequently, as at certain times in the day these rooms are often crowded, and any feeling approaching to stuffiness is most unpleasant, besides being unhealthy for the readers, and renders the work of the attendants who are there always doubly trying.

A free public library, as a rule, has to be completed for a sum that allows little for architectural splendour, but the requirements, being generally very simple, lead themselves admirably to a successful and dignified treatment, provided the designer confines his attention to such vital matters as good proportion and simplicity, with suitable details of whatever style he may adopt, to emphasise them, and not be carried away by any unnecessary feeling that the building wants breaking up somehow. This breaking-up, as a rule, is quite superfluous to the real requirements of the plan, embracing very often as it does bay windows and odd corners, neither of which are happy features in the public rooms of a free library, and is but too often the amazing conceit of the pencil as opposed to the common sense of the indiarubber.

After all, the public library is, or should be, a local centre of culture, and, apart from the books, the building itself should be of such a character as to elevate the minds and educate the public in the art of architecture, and make them feel that they are in a place which inclines them to improve their minds and morals in every way. I am afraid library committees often overlook this, and disregard the real and good in architecture in favour of the more showy on paper, which often masks an ill-arranged plan; the former being looked upon as a sort of joke, and likened to a stable, a workhouse, or any other building which they do not associate with architecture, but think merely bricks and mortar; whilst the latter, exhibiting all the tricks of draughtsmanship to illustrate the commonplace, is loudly appraised.

I will now give you a more detailed description of the internal arrangements of a library, but I think these are pretty generally known; however, the memory cannot be refreshed too often, and possibly if most of it is forgotten some of it will remain and prove useful in the future. The entrance should be spacious, and open into a good-sized hall or broad corridor, and these lend themselves to be particularly studied as the architectural features of the building. First appearances go a long way, and I should always endeavour to make the entrance attractive. From this hall as many of the rooms as possible should be directly approached;

the more-frequented rooms, as I mentioned before—such as the news and lending rooms—being, if possible, nearer the entrance. The counter or enclosure of the lending library should be conspicuous on entering, and, to my way of thinking, is better entirely open than having to pass through swing-doors to reach it. The reference room, being used by students and readers of more serious books, would necessarily be placed in the quietest part of the building, and in such a position where it would be unnecessary to be passed by people going into the other rooms. I suggest as a good place for it is within the lending library counter, so that readers—as a rule there are not many—could pass into it through a wicket gate, which would be under the control of the attendants. The books, too, in this room, being of more value, are thus afforded better protection, and the attendants know who the people are they pass into the rooms. In the case of a small library, a space for a table to be used by reference readers might possibly be arranged in the lending library itself by arranging the book-cases in a suitable manner, and I think in many cases this would give all that is required. In some buildings a separate room is given for juvenile readers, and great care must be exercised in planning so as to put this in a position near the attendants, and also where the occupants cannot make themselves a nuisance to the other readers. A separate entrance from the street is sometimes provided for this room, but I do not think it is a good arrangement, as, among other things, it makes an easy escape for the mischievous youngster after "checking" the attendants, and has many other objections.

One main public entrance for all parts is the simplest, and gives better control than where there are more. In a library building of ordinary size I don't see why the principal entrance should not open into a large space, which could be subdivided by arches or columns with balustrades, so as to group the various readers into the usual sections—*viz.*, magazines, news, lending, etc. Surely one person reading a newspaper and another a magazine can do so without having a solid wall or even a glazed partition between them. This arrangement would give excellent control, and there would be no annoyances caused by such small matters as the opening and shutting of doors. Of course, great care would be necessary to exclude draughts, and I can see no difficulty in this any more than in a building of a larger area. The librarian's room is well placed on the counter or enclosure side of the lending library. It need not have any direct communication with any of the public rooms; in fact, it is an office, pure and simple, where the occupant has much work to do without being continually worried in the control of the public using the library. This room is often used for the meeting of the library committee. With regard to the lavatory and water-closet accommodation for the public, this is sometimes provided, but in a small library I think it has many objections, and is liable to be a great nuisance. Of course, it is necessary to provide for the staff, and in many cases for both sexes, as female assistants are now very commonly employed. A good store-room and work-room, and a mess-room for the staff should also be provided within easy access of the lending library, and a separate entrance for delivery might be arranged in connexion with these rooms.

The lending library should be arranged so as to be worked either by the indicator system or by a more recent method known as the "open access." In the former case there must be a long counter for the indicators, with issue spaces between them. The amount of space occupied by the indicators varies from 35 in. to 10 in. for each 1,000 numbers, according to the particular type adopted. The counter should be somewhere about 32 in. high, so as to allow children and people of small stature to clearly see the top numbers of the indicators. The length of counter would be determined by the number of indicators in use, and a sufficient allowance should be made for possible extensions. As regards the issue desks, two, each at least 3 ft. wide, should be allowed to every 10,000 volumes. Good light on both sides is very necessary, so that the public on the one side and the attendants on the other have no difficulty in reading the numbers.

In the case of the "open access" system there must be an enclosure of ample size at the entrance to the lending library. In this an attendant would receive a book from the

person returning it, and would then allow him to pass through a "turnstile" or wicket-gate into the room itself—gangways only wide enough for single file of people—where he could choose his own volume from the shelves, and pass out through a similar gate or turnstile in the other side of the enclosure. The bookcases should be arranged "end on" to the counter or enclosure, and in close proximity to them, as an extra yard when multiplied by several visits a day considerably adds to the work of an attendant.

It is a question whether it is not more satisfactory to keep the books out of sight in a "stack room" (to borrow an American name) rather than have them within the view of the public. I always think there is a very untidy look about the cases themselves (particularly the iron ones) which does not add at all to the general appearance, and if only the space occupied by the public, together with the issue counter and the enclosure, were seen it might be made a good feature and treated architecturally as a central hall, or in any other way that might suggest itself. It is a mistake to be too economical with the size of the hall, and as long as it has no odd corners in it or obstructions a good area might well be allowed, and if it could be managed so as to do without corridors it would be all the better and much easier to supervise. It is also a point to be remembered that many of the readers in the news-room are people in want of a situation, who go there solely for the purpose of consulting the advertisement columns of the daily press, and it saves a lot of traffic in the library if the entrance lobby is made large enough to accommodate on the side walls notice-boards for the display of the advertisement sheets. But, of course, this means that the vestibule or lobby must be made fairly wide, so that easy access to the library itself is not interfered with.

The stack-room might be made high enough to take two or more tiers of bookcases over the lower ones, by having a light floor of perforated iron gratings between them. These floors would be reached by a straight staircase of about 3-6 minimum width. A circular staircase is not desirable, the small ones particularly being most awkward to either go up or come down. A book lift in a well-considered position is, of course, essential, where there is more than one tier.

With regard to the bookcases themselves, these are about 16 in. wide for a double one (that is for books on both sides), and the height is anything between 7 ft. and 8 ft.; often a step is provided so that short people can more easily reach the upper shelf. These double cases are better without a central partition between the books, as it allows of a freer current of air, and does away with corners where dust might accumulate, and also facilitates the washing and dusting of the shelves. A small fillet, however, might be nailed along the centre of the shelves to prevent the books from actually touching. Wooden shelves are generally $\frac{3}{4}$ in. thick, and should not be longer than 3 ft., as anything above that is awkward to use and has a tendency to sag. Wooden shelves have a better appearance than iron; they are cheaper, and if the corners are rounded do not tend to damage the bindings of the books so much. Iron shelves are, of course, more fire-resisting, but unless the whole building is made absolutely fireproof there is no real advantage in it. The bookcases should not be at a less distance apart than 3 ft., otherwise it is difficult to stand far enough back to see the upper shelves, and at the same time to allow people to pass. In the case of the "open access," a greater distance still should be allowed, and 4 ft. taken as a minimum. All counter tops or slopes should be of polished hard wood. Of course, I know many of us do not like the appearance of this, but it is a case where experience tells us that common-sense is better than "high-falootin'" ideas, however much we may sigh for wood left in its natural state to become interesting by use and time. Floors must be rendered as noiseless as possible, and wood blocks or cork carpet are generally used. Care must be taken in the latter case to have the floor thoroughly dry and well-ventilated from underneath, otherwise dry rot will occur. The walls should have glazed brick or tile dados in the public rooms and lobbies, as without them they are apt to get very much knocked about.

As regards artificial lighting, gas is bad, as it causes the bindings on the books to rot, and

electric light, where obtainable, is very much better, both for health and cleanliness. In many libraries a residence for the librarian is arranged, and suitable accommodation for it is two sitting-rooms, kitchen, scullery, pantry, with three or four bedrooms, bath-room, etc. In other cases the caretaker only will live on the premises, and in his case the provision of a kitchen with scullery, and pantry, a living-room, and two bedrooms and a bath-room, should be sufficient. With regard to the style of the rooms themselves, the larger ones should be treated as small halls rather than rooms, and the satisfactory lighting of them must be carefully considered. Good lofty rooms with windows high up, and, where possible, opposite to each other for cross ventilation, is a good arrangement; the height of sills from the floor line being about 5 ft. up in the news-room and lending library, so as to allow newspaper slopes and bookcases to run continuously round the walls. In the other rooms the ordinary sill height is preferable; personally, I do not like the appearance of either skylights or lantern lights—they tend to make a room anything but cheerful, and the idea of not being able to see out at all is objectionable. Of course, in certain cases it is difficult to do without them, but if possible always try hard to avoid them; at all events, for your main lighting. They are also unsightly things on the outside, and rather make a building look like a hotel billiard-room or swimming bath. In a small library rectangular rooms would be the best and most economical for furnishing. Bay windows and odd corners are wasteful, and not easy of supervision.

Unless there is anything against it, clear glass is preferable for the windows, and if any coloured glass be used, let it be done sparingly, and be of the best quality. It is always pleasant to look up and our now and then, and anything in the nature of opaque glass is objectionable where there is no reason for its use.

With regard to the exterior appearance of a public library, great simplicity is, as a rule, absolutely necessary, on account of cost, and is more dignified than the multiplication of much detail. The commonplace, with its many features, most of which are to the scale, one associates with a wedding-cake; the detail being very similar, is much admired by the uninitiated, who love to see a thing with plenty of detail on it, and which looks like a mighty effort of the designer to cram in all he knows (or all he does not know) in every style of architecture.

If it were possible to do without pencils or other sharp-pointed instruments, and draw with something blunter, I think in a generation or two we might see some of that regard for mass and proportion so highly appreciated by the ancients, and about which we hear so much but see so little, and the scale of detail might also be consistent throughout. However, I am not here to discourse about the possibilities or shortcomings of modern architecture, but I should like to see our public libraries designed with more character and restraint, and when I say restraint, I don't mean that merely holes in the wall for windows and doors is the right kind of simplicity, for this is nothing but poverty of ideas in design, and is not restraint at all. The art of leaving out should not be deliberative, and can only be acquired satisfactorily by constant study and experience.

Mr. Mackinn, the well-known American architect, who is responsible for the designs of some of the finest libraries in that country, when he was over here last summer, told a friend of mine that considering the splendid examples of old work here, particularly that by Inigo Jones, Sir Christopher Wren, and their contemporaries, he was surprised that it was not more cultivated by our present-day architects for public buildings. Here we have at our very doors a grand architecture, and I feel sure he is right in his remarks, but it must not be studied from the illustrations of the handful of men who are doing such work which appear from time to time in the pages of the building papers.

I have borrowed several plans from gentlemen whose names are well-known to you—as possibly are the buildings erected from them—and I should like to express my thanks to them for the loan and also for a good deal of information respecting them.

Mr. Maurice B. Adams opened the discussion and said there appeared to be scarcely anything which anyone possessed of experience in library planning would wish to take serious exception

to in Mr. Cox's paper on this subject; consequently it was not quite easy to promote an animated discussion, and, moreover, having undertaken to read a paper on rate-aided libraries during next month before the Leeds Architectural Society, he (the speaker) was precluded from saying on this occasion all that he had on his mind on the matter, otherwise by anticipating his lecture he might be thought lacking in courtesy to their *conféres* in Yorkshire. "However, I willingly respond to the invitation of the committee of the Architectural Association to attend this evening, and it gives me special pleasure to thus support the chair, and to commend the remarks which Mr. Cox has been good enough to put before us. His design for the Kingston-on-Thames Library, accepted in preference to my own in a limited competition a few years ago, makes a very admirable building, and the wisdom of the choice then made has been demonstrated by its execution. Last year, when acting as professional assessor for Wakefield Public Library, I had an enormous number of plans to deal with, many of them of distinct merit, but the result proved to be that Mr. Alfred Cox secured the honourable position of being chosen as architect for that building. These two circumstances, in which my professional relationship with our lecturer to-night happened to assume a concrete form, enable me to realise how thoroughly he has, on occasion, put his knowledge to the best advantage. I anticipated consequently that he would have incorporated in his paper this evening some decidedly precise and detailed particulars such as might lead to a more practical issue between us than that which seemingly is likely now to result. It is true, as he says, that admirable handbooks have appeared, and that other papers on libraries have been read, but we are every day going either forward or receding—there can be no standing still, the movement must be perpetual. I venture to doubt the wisdom of architects confining their interest too strictly to a mere knowledge of buildings, buildings, and the architect's range of interest cannot adversely be restricted to the question of libraries as buildings only, without embracing also their educational scope and possibilities. It is essential in all specialised work of this kind for the architect to cultivate a more or less intimate acquaintance with the process of contemporary development in progress. The library at the present juncture is already in a transitional stage, emerging, let us hope, from comparative obscurity to the full recognition of adequate importance, long enough ago accorded to it in America. The architect ought not to be content to follow only; while faithfully interpreting the wishes and adhering to the instructions of his clients, it is his business surely to do more than that so as to assist, at least, in some degree, the promoters of such undertakings as libraries to erect up-to-date premises fully adapted and equipped in accordance with the trend which improved methods and enlarged ideas are gradually assuming. In my paper, to which reference has already been made, there is one aspect of the library question to which I have devoted perhaps by far too little space, and it may be thought by architects, therefore, to that extent an opportunity has been lost. I allude to the artistic character of library buildings. With your permission possibly I may be allowed briefly to make good, as far as I can just now, the omission referred to. Eminently as a first principle, I suppose, the somewhat trite stipulation ought to prevail as to a library (or, for that matter, any other building) being made to look just liked, or it really is. Not a school, or a house, a town hall and offices, or a church! The affirmation of such premises is easy enough to start with, but they are not by any means so easily put into practice satisfactorily; very often such ideals have been sadly ignored. This shortcoming is more than often due to the fact that the special characteristics are masked by too close an adherence to traditional architectural lines, instead of allowing the particular needs of the interior to determine the exterior treatment. This is, I know, a very old reason to insist on here for it is patent to everybody. Mr. Cox has impressed us with the need of making libraries beautiful and worthy of their destiny. He alluded to the effect of skylights and their likelihood to make a library resemble a public bath, or perhaps a billiard-room. In parentheses let me add that quite apart from their appearance, roof lights are, in my opinion, open to several objections

a library, and especially if no ceiling lights are so provided. They are noisy when heavy sines are falling, and they are too subject to variations of temperature, causing draughts, as well as difficulties to keep them water-tight. Ceiling lights also get very rusty and need provision for easy cleaning. I much prefer vertical dormers and lantern lights—they aid ventilation better, and, at least, are capable of architectural treatment. Still, skylights have to be employed at times, and by reference one puts them on the rear slopes of the roof, out of sight. Where no choice is left, and they have to be located where they otherwise would be conspicuous, I fancy their presence can be masked by good tall parapets, because such sloped lights need not be near the edge. This idea of a parapet implies a cornice, and that in turn indicates a monumental arcade necessitating a more than usual breadth of handling and scale. Then, again, Mr. Cox has intimated that angles, bays, and projecting centres have a tendency to break up designs needlessly and obstruct supervision, which, in a way, is perfectly true. And, further, he suggestively dilates on window contrivances. We all know that windows placed low down in libraries waste internal wall-space and encourage leaning, which constitutes one of the bug-bears of modern reading-room work. Then, added to the possibilities of fenestration arrangement, ample scope for inventive skill will be found in the management of the main entrance to our libraries. It should be spacious and dignified. Last of all, however, and dominating all these details, comes in the primary advantage belonging to the facility of supervision, always and only to be insured by making all the public rooms on one floor. Consequently the general outline of an ideal library, where the site allows of this arrangement, should be comparatively low in proportion with a spreading plan. These, then, are the prevailing conditions to be observed in facade management of library design, and they are sufficiently diverse to allow of considerable variety of treatment, but there can be no reason why these buildings should be made bald and forbiddingly severe with uncounted, bald expanses of brickwork or prison-like masonry, instead of encouraging a sense of picturesque homeliness and brightness of effect. On the other hand, all playfulness peculiar to a building adapted mainly to passing amusement or even social hospitality ought to be avoided, and it goes without saying that all stucco or ornament and vulgarity of detail is always out of place. For style, the English Renaissance appears best adapted to present-day needs by allowing sufficient margin of diversity consequent upon the exigencies of sectional contrivance, as also the immediate arrangement of planning. This reference to the sections of these buildings directs attention to one of their essential peculiarities, owing to the relative heights of their internal dispositions, which demand the utmost care and attention where economy and compactness become determining factors for success. They exercise a controlling influence, too, on the exterior, imparting the very individuality which every architect of taste only too readily recognises. Mr. Cox has rightly drawn attention to the gain associated with an impressive, not to say stately, entrance-hall, out of which the several departments should diverge. The fault, nevertheless, which sometimes may be noticed in this respect, is that designers of libraries overlook the great importance of proportionate height required to ensure a real feeling of spaciousness, so that by this oversight halls which look roomy enough on the plans are cramped in effect by reason of an upper floor or mezzanine above, crushing their height down to perhaps 8 ft. or even less. The larger the plan the greater the depression. Instances of this could readily be mentioned. As to the architectural treatment of reading-room interiors by arcing and inter-columniation, opening up the whole series of apartments into one large undivided whole, no doubt the lecturer's suggestion possesses the merit of ambitious possibilities, but the vast majority of librarians prefer separate rooms for newspapers as distinct from magazines. The concentration of a reader's attention is much influenced by his environment, and study is best promoted by a relatively restricted space, to say nothing about draughts and the difficulties of heating, which already are sufficiently complicated and troublesome. Mr. Cox has in passing briefly mentioned the essential differences of the open access library as contrasted with the indicator

system—a very crucial point of the utmost consequence. He has, by way of detail, suggested apparently in any case that the reference-room entrance might with advantage be placed behind or within the lending library counter. This plan, I think, is open to the objection that when the issue of books closes on certain evenings of the week, no one would be able to use the reference-room without exposing the stack-room to intrusion, and besides it is most desirable to keep the reference-room always open for access to directories and other reference books, usually kept in these apartments, and, of course, for reading the heavier monthlies and quarterlies. As to the further observation about permitting the reference-room readers to have a table in the lending library stack-room, and group the book-cases suitably for the purpose, it would be hardly possible to discuss that point without opening up the whole question of library administration, which, to a considerable degree, must depend on the burning problem of rate-aid v. State-aid, and it also touches the crying need of reference-room development. To-night we have, perhaps, wisely omitted such matters, though had I not been limited, as already mentioned, I would rather have considered the provision of the library in a broader sense than has now been possible."

Mr. H. T. Hare, in proposing a vote of thanks, said that the subject was of very great interest, as libraries were the commonest buildings now being erected in our towns. He had had a little experience in the erection of free libraries, and the conclusion he had come to was that, although a free library was an extremely simple building to deal with, it was also one of the most difficult. He was inclined to question whether, given an absolutely free site and the ordinary requirements, it was possible to get an absolutely perfect plan. He did not believe it was possible—that was, to get a plan that would meet the whole requirements in a perfectly satisfactory way. The first necessity for a free library, he supposed, was that the supervision of all parts of it occupied by the public should be easy and complete. He thought there was a tendency for a certain amount of confusion of idea as to how this supervision was to be obtained. The general idea was that the staff who were in the lending library were going to supervise the common arrangements, and the consequence was that the various rooms were more or less grouped round the lending library; but in most libraries of any size there was a porter or commissionaire, and he did the real supervision of the various rooms. The staff were generally occupied in other ways, and if it was suggested to one of the staff that part of his duty was to supervise he would generally be offended; he had other things to do, and did not like to think that supervision was part of his duty. It simplified the question of supervision very much if the news-room and the magazine-room were supervised by a porter. Mr. Cox had made a slight suggestion as to throwing all the rooms into one. There was a great deal more in that idea than Mr. Cox made of it. The real solution of the question would be to do away with the many rooms and have one great hall for all the requirements. That seemed to him to be the best arrangement for a free library. He had never been in a free library where the fittings were widely enough separated; they were crowded together, and the rooms looked cramped. Any suggestion of that kind would be obviated if they could get rid of all internal walls. As to a good entrance hall, he did not believe in it, and he did not think one was required. He liked to go into a free library directly out of the street—through two doors, if they liked, but to enter in as one did into a church. As to the lending library, he did not regard it as such a necessity that it should be on the ground floor. He supposed that nineteen people out of twenty who went to a library went to the magazine-room or news-room, and it was only on certain times of the day and certain days of the week that there was a large number going to the lending library, and it did not seem to him to be objectionable to put the lending library on the upper floor. There were a great many advantages in doing so. The reference library was, in most cases in a library of any size, put upstairs, and if the lending library was put upstairs also it was possible to get all the books together, and have them directly under the control of the same staff. There was never a large number of people in the reference library together, and

there was an advantage that way, for the whole of the staff could be on the upper floor, and could attend to both libraries. The ground floor, then, could be devoted to the news-room and magazine-room, and could be supervised by the porter. The only difficulty was as to the staircase, and it was one of the most serious difficulties in the planning of a free library to arrange the staircase in a satisfactory way, though it could be done, he thought. As to the external treatment, he agreed with what Mr. Cox had said. The simpler the treatment the better, though the building ought to have the appearance of a public building and not a domestic one, for it was a public building and ought to look like one. In a great many libraries there was a house for the caretaker. That was a feature most committees liked to have, thinking they saved money that way; but, as a matter of fact, a caretaker's house generally cost half as much as the library itself, and a caretaker's house could be rented, generally, at a quarter the cost of the house that was built. He had tried to impress this upon committees, but they could not be got to see that it was a fact. Mr. Cox had given some particulars as to what he considered to be the correct arrangement of a lending library counter and the accommodation for the indicators. He (the speaker) was inclined to think that the best arrangement for the lending library counter was to put on the top of the whole length of the counter a screen with openings for the issue of books and one or two spaces for indicators, but the majority of librarians had exaggerated ideas of the number of indicators required. There was no necessity to have indicators for the whole number of books in a library. If there were indicators for 5,000 or 6,000 books in a lending library that was quite sufficient. It was ridiculous to have indicators for all the books.

Mr. S. D. Adshead, in seconding the vote of thanks, said that Mr. Cox did not appear to have touched on the question of the relative merits of the open access and the indicator systems. There was a great deal of discussion on the subject just now, and in his opinion the indicator system was the best. In theory the open access seemed the best, but in practice it led to the injury of books, to confusion, and the necessity for more supervision. People pulled down half the books before deciding what to take away. He did not think that the system was a favourite one with librarians, and it should be considered as out of the question in a district populated with the very poor class of reader. Keeping before his mind a number of well-known plans, he appeared to him we had got to a stage in planning where there were two distinct developments; first of all, there was the plan which places the news-room and magazine-room, the lending department and the reference-room all within separate walls, separately heated and lighted; then there was the plan which was, he thought, the more modern one, where the news-room, the magazine-room, the borrower's space, and the lending department were all divided off by low screens, but were all under one ceiling. He thought that this was a very good arrangement, though he did not go so far as to say that there should be no division whatever between the departments; the low screen helps to classify the arrangement. Mr. Cox seemed to advocate arranging a space within the lending department with tables for reference readers. He (the speaker) did not see what was to be gained by this. He thought that the reference-room should in all cases be a separate room in a position where there would be as little intrusion and movement as possible, both by readers and librarian. Mr. Cox said that the question of lavatory accommodation should be settled by the size of the library; but in deciding whether to have lavatories for the public or no the position of the library building in the town and the class of reader were, in his opinion, what he had to consider. We could not over-emphasise the importance of having a library simple and dignified in design, and he agreed entirely with what Mr. Cox had to say about this. The entrance hall should be dignified, and everything here should be sacrificed to architectural effect. As to the architectural effect of the reading-rooms, any architecture in these rooms should be so refined in proportion and so unobtrusive that the ordinary reader would not notice any architecture whatever. Mr. Cox seemed to have a great objection to top

lighting. He (the speaker) thought that, if the difficulties of ventilation could be got over, this was by far the best means of lighting a library. Under no circumstances should an architect omit to put at least one large sash window in every department to get a good blow through if necessary. With regard to the fittings. In the news-room there was no doubt that by far the best arrangement was to have the newspaper stands sloped all round the room; newspaper stands seemed to block up the space and lead to all sorts of dodging about, and, where there was room, should be abolished in all cases. With regard to the fittings in the reference-room, he understood that in some libraries recently erected the books used in the reference-room were all kept in the lending department, the idea being to save space. He thought that this was a very great pity, as it robbed the reference-room of its proper character; the finest possible treatment of wall surface in a library was a surface of books. Rather than take all the books out of the reference-room he would prefer to reduce the number of books in the lending department and save space there.

Mr. S. K. Greenlade said that any remarks he had to make would be as to American libraries. In America the free access system was in vogue as against the indicator system here, and that was the great difference between the libraries in the two countries. In America the people had somehow learnt to treat books well, for they were rarely damaged or stolen, and the children—the children's room in the American library being made a great feature—went and took down their books and gave little trouble to the attendants. There was no mistaking a library in America; it was a scholarly and monumental building, and although many were somewhat small—a central entrance hall, a general reference and reading-room on the left, the children's room on the right, and a stack-room with the delivery counter at the back—the majority were large buildings which had been provided by wealthy people, and money was not spared. It was interesting to compare the elevations of American libraries with those of English libraries now being erected, and he would advise all of them to look at the designs of American architects for the library buildings they erected. The American architect was in this respect far ahead of the English architect. As to the lending library being upstairs, in the great American libraries—in the fine one at Boston, which was really the start of the library building movement in America, the lending library is upstairs, as well as the general reading-room, and the reference-rooms are on the second floor, and in nearly all the large libraries it was so—except the two University libraries in New York, viz., those of Columbia University and the New York University, both of which have great central domed reading-rooms on the ground floor—the former octagonal and the latter circular. A similar method is adopted in the great national library at Washington. In the library at Washington one sees the first attempt at the storage of books adequately on anything like a great scale; at that library there are about 3,000,000, and there was room for more. They were all placed in great rooms which had stacks of steel frames with marble floors, and were seven or eight stories high. All the framing of these bookcases was of iron, having steel shelving with rounded edges, with parallel openings to let the dust fall to the ground, all very well designed. It would be a good thing if the Association would get a catalogue of some of these library fittings in order to see how well things were designed. Mr. Cox suggested tables amongst the books; that was often done in America. One of the most recent libraries was at Utica, and at the back of the stack-room was a space fitted with tables for the use of special students who had free access to the books; and the same thing was done in Columbia University library. Here the special subject rooms are arranged in the arms of the octagon on the first floor, and the student passes from the internal corridor through the stack to the room beyond, fitted purposely with lockers, etc., for his note books, and with all the necessary books he needs for the study of the special subject round about him. In London, from the students' point of view, we were badly provided. At Columbia University, Boston, Washington, New York, and all the great libraries, anyone could enter up to ten o'clock at night, including Sunday, and see whatever book he wanted. At

South Kensington Museum Library there were only three nights a week for the student up to a quarter to ten o'clock, and he hoped the London County Council or some generous individual would provide a library of the kind that was required near the new Craft school they were building in Southampton Row. It would be very central, and could be made very practical and interesting, chiefly devoted to the crafts. It could be opened from ten to ten daily—including Sundays. In plans it should be so arranged that the books and photographs of each of the crafts could be arranged in alcoves, with cases for specimens and proper tables and desks for study and drawing. A small annual expenditure of a few hundred pounds—judiciously spent—would soon enable a collection of fine examples of work illustrating all the crafts to be got together, and the study of this, as well as the photograph of old work, should inspire the keen student. This is being done in every capital in Europe—except here. Why not London? Such an institution as that would give a man in London a chance; now there was no opportunity for a student to study in that way. He hoped it would be settled one day whether the British Museum was to be a library or a museum. At the present time it was hopelessly cramped, and where the books were stored the arrangements were most inadequate. It was not a stack, and the space was badly lighted. Would it not be well if the authorities, now that the proposed additions were being considered, tackled the whole scheme in a noble manner, and not merely look ahead for five or ten years—but fifty. Such arrangements for the storage of books as those at Washington should be followed, and the sooner it is realised the better for the collection and the nation. If a student wanted to study library planning, he should study what had been done in America and not what had been done in England.

Mr. Arnold S. Tayler supported the vote of thanks, and said that, while it was good to have brought before them such illustrations as they saw round the walls, too often they did not get all the advantage from that that they should. The lecturer saw and knew the good and bad points of a design, but he often neglected to point them out to others. As to all rooms being under one ceiling, he would rather not attempt to read in a room where people were borrowing books.

Mr. Arthur Keen said he had never built a library, and he began to fear he never should, but it occurred to him to say, in reference to side lighting or top lighting, that, in libraries where the open access system obtained, people got in each other's light very much where the bookcases were side lighted, and with top lighting the objection disappeared very much. It seemed to him that Sir John Soane's interiors were always satisfactory, and that that architect hardly ever lighted large rooms from the side, but always from the top. At the Bank of England one could see this to advantage. It was a principle which might well be adhered to in large and monumental buildings.

The President, in putting the vote of thanks, said he thought that more might be made of a large hall in these buildings. He did not think that the people who read some of the magazines and newspapers to be found in libraries needed to be shut up in separate rooms. The works of reference should be kept apart, and this was generally done. Finer and grander effects might be obtained in small libraries if the bulk of the rooms were arranged under one ceiling. As to the provision of lavatories, in many places they were unnecessary, and in many small libraries they were not wanted, and their provision led to abuse. With the vote of thanks he would include the name of Mr. Adams for his interesting remarks.

The vote of thanks having been heartily agreed to.

Mr. Cox, in reply, said that Mr. Adams' contribution to the discussion was very interesting to him, as somewhat showing the views of one who had had so much to do with the erection of public libraries. He thought that a great advance had been made in the planning of these buildings, although practically without new conditions being imposed. Considering that librarians differed so in their views as to the working and architects as to the planning, he thought it might bring about good results if a conference could be held between them. He did not think there was any hidden mystery in the planning of buildings for special purposes, and an architect who cramped himself by a multitude of regulations, which were not really

of much importance, would probably produce a crooked and choked plan. Surely a good, straightforward plan on broad lines could more easily be adapted to the working requirements of the librarian. Possibly the competition system prevented fresh developments, as the conditions were generally drawn up on past experience, and a competitor would certainly think twice before he broke fresh ground on one and only hope that the assessor might favour his views. Competitions helped to keep a good tone on existing conditions, but possibly a more distinct advance might be made if an architect and a librarian could discuss matters with a committee before the plans were made. With regard to the relative merits of the "indicator" and the "open access" systems of administration, he thought this was more a matter for librarians to discuss. An architect's work was to arrange the building to the best advantage, whichever system was adopted. He agreed with Mr. Hare in most of his remarks and pointed out that the arrangements of the different sections in one large space rather than in separate rooms had been suggested in the paper he had just read. In this case the central hall, to which Mr. Hare took exception, would, of course, disappear altogether.

The Chairman said that the next meeting would be held on the 27th inst., when Messrs. J. B. Fulton and E. F. Reynolds would read papers on "Byzantine Architecture."

The meeting then concluded.

DIARIES, ETC.

MESSRS. HUDSON & KEARNS, 83, Southwark-street, S.E., have sent us a parcel of their excellent diaries for architects and builders. These well-known publications are admirably arranged and printed, and, in addition to information usually to be found in a diary, they contain articles and facts for the use of architects, builders, and others. These diaries must be so well known to our readers that further reference to them is unnecessary.

Messrs. Hayward Bros. & Eckstein, Ltd., of Union-street, Borough, S.E., have issued a useful scribbling diary. It is interleaved with blotting-paper.

Messrs. Ashwell & Nesbit, Ltd., warning, ventilating, etc., engineers, have issued a large size tear-off date indicator.

COMPETITIONS.

HAMMERSMITH BATHS AND WASH-HOUSES.—In a report circulated on Tuesday the Baths and Wash-houses Committee of Hammersmith Borough Council state that they have decided (subject to the usual sanction) to invite the following six architects, who have signified their willingness to enter the competition, to send in designs for the erection of public baths and wash-houses:—Mr. Maurice B. Adams, F.R.I.B.A., Mr. Alfred W. F. Cross, F.R.I.B.A., Mr. J. Ernest Franck, A.R.I.B.A., Mr. E. Harding Payne, A.R.I.B.A., Mr. James M. Ross, and Messrs. H. Spalding, F.R.I.B.A., and R. H. Spalding, A.R.I.B.A. Each competitor is to be paid a fee of twenty-five guineas, except in the case of the successful design where the commission to the architect will be five per cent. on the amount of the contract. The committee, acting in conjunction with the Borough Surveyor (Mr. Hugh Mair, M.I.C.E.), is to adjudicate upon the competitive designs and report thereon to the Council.

BOOKS RECEIVED.

LOCKWOOD'S BUILDERS' AND CONTRACTORS' PRICE BOOK, 1905. Edited by F. T. Miller. A.R.I.B.A. (Crosby Lockwood & Son. 4s.)

QUARTERLY JOURNAL OF THE ROYAL SANITARY INSTITUTE. (E. Stanford. 2s. 6d.)

SANITARY LAW AND PRACTICE. By B. W. Robertson, M.D., and Charles Porter, M.D. (The Sanitary Publishing Co. 10s. 6d.)

THE SEWAGE PROBLEM. By Arthur J. Martin, A.M.Inst.C.E. (The Sanitary Publishing Co. 8s. 6d.)

SIMPLE METHODS OF TESTING SEWAGE EFFLUENTS. By Geo. Thudichum, F.I.C. (The Sanitary Publishing Co. 2s. 6d.)

THE SCIENTIFIC DESIGN OF MASONRY ARCHES. By Thos. Alexander, M.A.I., and A. W. Thomson, D.Sc. (Dublin University Press.)

Correspondence.

A SPRING-GARDENS SITE.

Sm.—In the article on "Spring-gardens, Haring Cross, and Whitehall" in the last number of the *Builder*, there is a slight inaccuracy which is hardly worth while correcting in print, but to which I think I may as well call your attention.

On page 7, column 5, it is stated that the extension of Messrs. Cocks & Biddulph's bank was built on the site of No. 31 (late 20), Spring-gardens. The extension really occupies the site of Nos. 33 and 35.

No. 31 (late 20) is now occupied by the London County Council, Mr. Oldrid Scott's offices having been transferred to No. 35 some years ago.

No. 20 (now 31) was at one time the residence of Lord Brougham.

CHAS. R. BAKER-KING
(Late of 35, Spring-gardens).

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE-STEEL.—II.

A FACTORY BUILDING OF FIVE STORIES.

THE example of construction described and illustrated in the present article is a building recently erected in Philadelphia and used as a machine shop. It has a frontage of 120 ft., and measures 100 ft. from front to back. Fig. 7 is a section of the building showing the five stories in the front portion and the single story extension at the back with a Yorkshire roof. With the exception of the outer walls, which are of brick with stone and terra-cotta facings, the entire structure is of concrete-steel.

A general idea of the building will be obtained by examination of the section, where the outlines of the main structural features are

indicated. In the front portion the interior columns are disposed in two parallel rows 18 ft. apart, and the columns in each row are 14 ft. apart centre to centre. They are of concrete, reinforced by four vertical round bars and horizontal flat bars, and, as indicated in the figure, the dimensions of the columns vary from 2 ft. 2 in. square in the basement to 8 in. square in the top story. The columns of each row are connected by concrete-steel main beams, of which the cross-section measures 10 in. wide by 14 in. deep on each floor, these beams being connected by secondary beams, or floor joists, measuring 6 in. wide by 12 in. deep.

The roof is formed of concrete-steel beams, with a covering of slag laid on concrete, and at the back there is a small tower containing a water tank. All the floor slabs between the main beams and joists are of concrete, and the floors of the basement and ground floor are finished with cement.

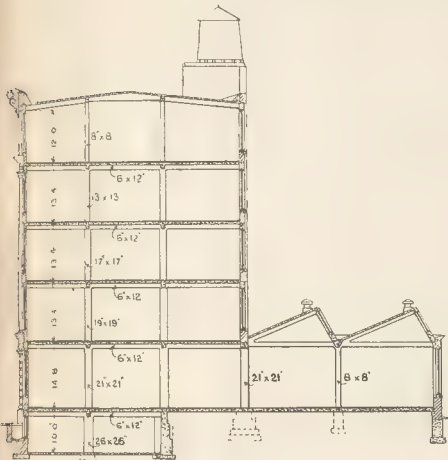


FIG. 7.

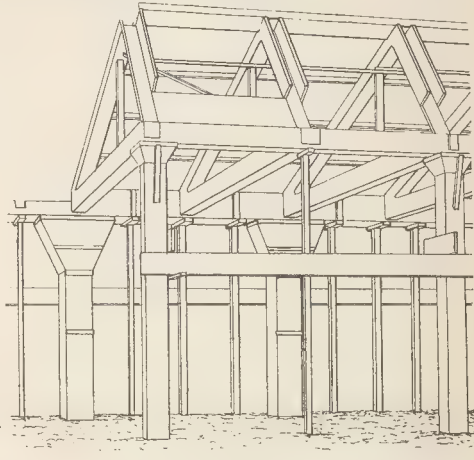


FIG. 11.

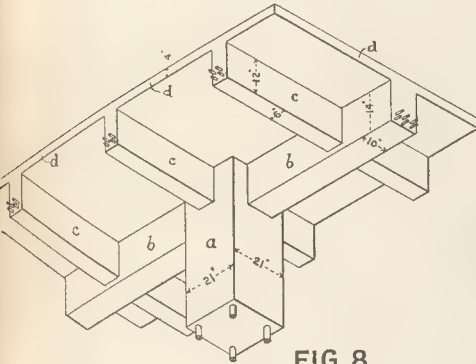


FIG. 8.

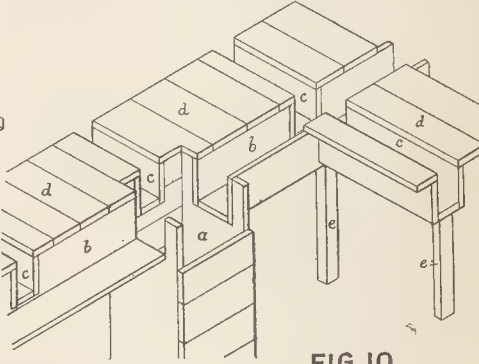


FIG. 10.

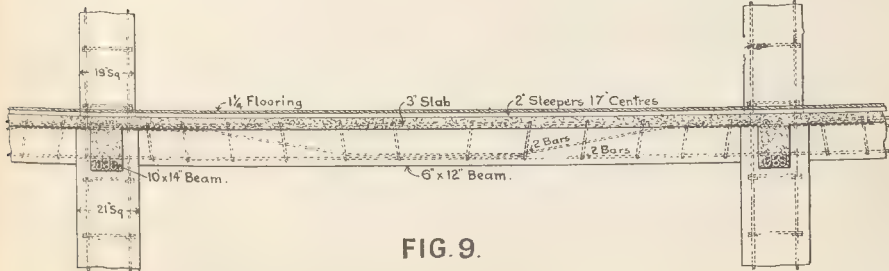


FIG. 9.

Illustrations to Student's Column.

At the back of the front portion of the building the outer wall is supported by a row of concrete-steel columns, with a cross-section of 21 in. square, connected with concrete-steel girders.

The interior columns, beams, and roof of the back portion are also of reinforced concrete, the roof covering of the longer slopes being of slag laid on concrete and supported by concrete-steel principals, the shorter slopes being filled with skylights between the principals.

As usual in construction of the kind, the whole of the columns, main and secondary beams, and floor slabs, form a monolithic structure.

Fig. 8 is an isometric drawing of a portion of the work, including part of one column (a), of two girders (bb), of three joists (ccc), and of the floor slab (ddd). This figure shows the appearance presented by the underside of the first floor.

The details of the reinforcement in the columns and beams are shown in Fig. 9, wherein are represented parts of the columns above and below the first floor and a portion of the first floor itself. In the columns the reinforcement consists of four vertical bars passed through holes in sets of four flat bars spaced about 16 in. apart in a vertical direction. In the 6-in. by 12-in. beam, or joist, the reinforcement comprises two horizontal bars in the tension area, these bars running through the columns so as to form continuous reinforcement; and two bent bars, providing for tension in the upper portion of the cross-section near the ends and in the lower portion of the section at the middle of the beam. There are also two horizontal bars near the upper surface of the beam and a series of stirrups for assisting the concrete to resist shearing stresses. The reinforcement of the main beams is not fully shown in the drawing, as the section of these is taken at the middle of the span, where the lower horizontal bars and the bent bars meet, and the upper horizontal bars are omitted.

The floor slab between the girders and joists is 3 in. thick and covered with 14-in. floor boards of maple laid on 2-in. sleepers 17 in. apart centre to centre. This method of floor covering applies to all the upper stories of the building.

Fig. 10 is an isometric drawing of the moulds and centring employed for forming the concrete of the columns, girders, joists, and floor slab. The upper end of the column mould (a) is framed to the moulds for the girders (bb) and for the joists (ccc), and the floor centring (ddd) is nailed down to the side boards of the moulds. In addition to the support afforded by the column moulds, the beam moulds are supported by means of struts, as (ee), placed at suitable intervals.

In depositing the concrete, the column moulds were filled up to floor level, all the other moulds were then filled, and the floor centring was covered with the least possible delay, so as to avoid any discontinuity between the different portions of the work. The joints of the column reinforcement were made well above the different floors, and numerous bolts were set in the floor slab for the purpose of fixing the timber sleepers for the maple boarding. Other bolts were built into the lower part of the girders for the attachment of hangers for the shafting to be used for running machinery. These bolts were passed through holes in the bottom boards of the various moulds.

Fig. 11 is a perspective drawing of the moulds used for the Yorkshire roof extension at the back of the building. It will be seen from this illustration that the entire framework is of concrete. The drawing here reproduced has been made from a photographic view taken at ground level before the moulds were completed by the addition of the boarding upon which the concrete roof covering was deposited. The figure includes a portion of the forms used for the construction of one section of the single-story extension.

In the background will be observed the moulds for the columns to which are transmitted the loads carried by the back wall of the five-story building and the weight of the wall itself. The columns in question are provided with bracketing for the more adequate support of the continuous main girder running along the whole width of the structure.

Part of the main girder mould shown at the extreme left-hand of the drawing is incomplete, the full depth being as represented in the body of the drawing. Several of the struts for the intermediate support of the girder moulds will also be seen in the background, and one in the foreground.

In addition to the skylights in the shorter slope of the roof, several openings were provided in the longer slope for ventilators. These openings were formed by placing core boxes upon the roof boarding and leaving the board inside the core free from concrete when the roof slab was formed.

Owing to the uniformity of construction of the different floors, the same moulds could be used in succession for all the stories, and the only modification necessary was the diminution of the cross-section of the column moulds in accordance with the dimensions shown in Fig. 7.

Similarly, only one set of moulds was required for the single-story extension, as this was erected in sections of uniform area, and the temporary framework was moved from section to section until the whole of the structure was completed.

In this way the cost of the forms was reduced to a minimum, so that it bore but a very small proportion to the total value of the work.

Being designed for the use of machinery, the ground floor was proportioned for a uniformly distributed load of 300 lb. per sq. ft., the first floor for a similar load of 200 lb. per sq. ft., and each of the floors above for a load of 150 lb. per sq. ft.

This example of construction has been selected for its extreme simplicity as well as for its general compliance with types of design very familiar to architects and builders in this country, and notably in the respect that all the outer walls are of the self-sustaining type. For this reason there is nothing to prevent the erection of similar buildings even under the regulations of the present London Building Act.

With the exception of the extended portion at the rear of the main structure, there is nothing in the building materially different from the skeleton of an ordinary dwelling-house, office building, or hotel. For the design of such a building, the assistance of a concrete-steel expert is quite unnecessary. Any architect who is accustomed to the calculation of floor and column loads could easily design the necessary concrete-steel members by the aid of the formulae given in our previous series of articles, and the division of the various floors into rooms of the required sizes could easily be accomplished by means of any approved system of fire-resisting partitions, the weight of which would come upon the main and secondary girders. In the case of light partitions for very small apartments, such as lobbies, ante-rooms, dressing-rooms, or small offices of any kind, it would be perfectly easy to add small joists if the floor slabs themselves were found inadequate to sustain the concentrated load of the partitions.

The owner of the building here illustrated was induced to adopt concrete-steel construction in consequence of its fire-resisting properties and also because of its low cost as compared with that of a steel-frame building. The structure was designed and erected under the superintendence of Messrs. Ballinger & Perrot, architects, Philadelphia.

OBITUARY.

MR. PERKINS.—The decease, on December 23, is announced of Mr. Arthur Edward Perkins, of Finchley, and formerly of John-street, Bedford-row, W.C., in his 61st year. Mr. Perkins was elected a Fellow of the Royal Institute of British Architects on January 4, of last year.

MR. HOMES.—The death is announced also of Mr. Edwin Hobbs, senior member of the firm of Messrs. Earp, Hobbs, & Miller, architectural sculptors and carvers, of London and Manchester. Of some of the work executed by Mr. Earp and the firm we may cite the pulpit, with lectern and gas brackets of brass, Accomb parish church, Yorkshire; the William Bagge, being a traveller's rest, at Swaffham (illustrated in the *Builder* of June 2, 1883); the credence table and reredos, all the carving, and the figure of the Good Shepherd in the tympanum over the door of the mission church and schools, Bedfordbury, Covent Garden (November 23, 1861); the alabaster and marble reredos, St. Margaret's, Lee; the pulpit, St. Peter's, Eaton-square; the reredos, St. James's, West Hackney; and the interior carving in the India Office.

MR. ELKINGTON.—Mr. Frederick Elkington, eldest son of Mr. G. Richards Elkington, the patentee of electro-plating, died, aged 78, at

his residence, Sion Hill, Wolverley, near Kidderminster, on January 2. Mr. Elkington became a freeman of the Goldsmiths' Company in 1885, and entered the livery of that Company five years afterwards. He was a member of the governing body of the Imperial Fraternity, and a Chevalier of the Order of Francis Joseph. His labours in the advancement of the silversmiths' art and the deservingly treatment of the precious metals were recognised by his admission, fifty years ago, as a Chevalier into the Legion of Honour, and his advancement as an Officer in 1875, at the Paris Exhibition. With his brothers he built St. Mary's Church, Barry Port, in Glamorganshire, in memory of their father, and he generously supported church work in Birmingham, his native city. Mr. Elkington occupied from time to time various offices in the county of Worcester, of which he was a deputy-lieutenant, and in 1878 held sheriff. By his wife, a daughter of the late Mr. William Bartlett, of Redditch, whom he married in 1850, he leaves three sons and four daughters. He was an enthusiastic member of the Volunteer force, and formed a valuable collection of Chinese and Japanese enamelled work.

MR. AICKMANN.—Mr. George Aickmann, A.R.S.A., died at Edinburgh on last Sunday, aged 75 years. About thirty-five years ago, having been until that period an engraver and lithographer, Mr. Aickmann devoted himself to landscape painting, and was shortly afterwards elected an Associate of the Royal Scottish Academy. He contributed many articles to the art journals, and possessed extensive knowledge of the works and careers of Scottish artists.

GENERAL BUILDING NEWS.

NEW CHURCH, SEATON DELAVAL.—On the 25th ult. St. Stephen's Mission Church at Seaton Delaval was opened. The new building is of brick, with stone facings and a tiled roof. It is built in the Elizabethan style, and has been erected from plans by Mr. Errington, architect, by Mr. Jos. Stobbs, contractor, Cramlington, at a cost of about 2,000l.

PROPOSED NEW CHURCH, DUNDEE.—Building operations are shortly to be commenced on a new church which is to be erected in the Chepington district, Dundee, for the United Free Congregation. The plans have been prepared by Mr. T. M. Cappon, who, after competition, was selected as architect. The building will occupy a site at the corner of Arklay-street and Esk-street. The plan is cruciform, with side and end galleries. Seating accommodation is provided for 300 persons. In addition to the church proper, there will be a hall, capable of seating about 350 persons, with vestry, classroom, and the necessary retiring-rooms. The estimated cost of the work is 4,750l.

ROMAN CATHOLIC SCHOOLS, SHEPHERD.—New Roman Catholic schools have been erected at the corner of Field-street and Britannia-street, and fronting the road to and adjoining the public recreation ground. The new additions adjoin the infant school in Britannia-street, and provide accommodation for 220 mixed scholars, in four classrooms, which, when opened, forms a room 85 ft. by 24 ft. Separate entrances are provided for boys and girls, each connected with a corridor running the whole length of the school. From the corridor are built cloakrooms and lavatories, and also a private room for the headmaster. The schoolroom floor is of wood blocks. The internal walls are lined with white glazed bricks to a height of 4 ft., and above this they are finished with cement stucco. The internal woodwork and roof principals are of pitch-pine varnished, and the ceiling is finished in white plaster. The external finish of the new additions is of red pressed bricks, relieved by stone dressings. Messrs. Atkin Brothers and Mr. J. Webster, of Shephard, were the builders, and the architect was Messrs. McCarthy & Co.

VICARAGE, TUNBRIDGE WELLS.—A new vicarage is being erected at Tunbridge Wells on a site at the junction of Calverley-road and Calverley Park-gardens. The work is being carried out by Messrs. Strange & Sons, Tunbridge Wells, from designs by Mr. Percy K. Allen, architect, in the same town.

CHURCH-ROOM, BRIGHTON.—The foundation-stone was recently laid of a new church-room which is being erected in connexion with St. Martin's church at Brighton. Messrs. Clayton & Black are the architects for the work.

Mission HALL, PONTYPPOOL.—The new Presbyterian mission hall, which has been recently opened. The walls are built with Gwynedd dressed stone, with Bath stone dressings, and the windows are of stained glass. The

principal entrance leads into a vestibule, from which access is obtained to the ground floor of the hall and to the stairs leading to the gallery. The latter is also reached directly from the street, without stairs, by means of an entrance on the higher level at the side. The gallery is carried round three sides of the building. The roof is an open-timbered one, lined with match-board. At the end of the hall are the platform and choir gallery. The hall is lit throughout with electricity. The builders are Messrs Morgan & Evans, Pontnewynydd, and the architects Messrs Habershon, Fawcoker, & Co., Newport and Cardiff.

WESLEYAN METHODIST HALL, SHOTLEY BRIDGE.—The new Wesley Hall at Shotley Bridge has just been completed at a cost of about 1,000. The building, which is 53 ft. by 31 ft., consists of classrooms, a minister's vestry, and other adjuncts. The architect is Mr. W. Spence, of Shotley Bridge.

LINCOLN BANK, GERMANY.—The new buildings for the Union of London and Smith's Bank occupy the site of the garden in front of the old bank. On the ground floor the bank office is 43 ft. by 37 ft., and is approached from the street through a vestibule which is panelled in teak. The public space is some 11 ft. across and is also panelled. The back portion of the office is lit with some clerestory windows over the rear buildings, which consist of a waiting-room, manager's room, and two strongrooms, with a lavatory for the use of the clerks, and a bookroom, stationery store, etc., beyond. Access is obtained from the passage leading to Osborne-street for the use of the staff, where there is also a tradesman's entrance for the residence over the bank. The private entrance is at the side of the bank, shut off from Victoria-street West by a wrought-iron gate, and leads to the residence on the first, second, and third floors. Externally, in front, the building is of Ancaster stone. The rear elevation is faced with white Suffolk bricks, with the exception of one portion which is covered with rough-cast, and the roofs are slated with green Tiberthwaite Westmorland slate. The architect for the building is Mr. W. Campbell Jones, of London. The builders are Messrs. Hewins & Goodhand, of Grimsby; and the electric light work has been done by Mr. Dolby.

BANK PREMISES, LOCHEE, DUNDEE.—The new premises of the Dundee Savings Bank in High-street, Lochee, have just been opened. The building is built of stone from the Camparden Quarries. The style is Renaissance, the central feature being two detached composite columns, with carved capitals flanked with rusticated pilasters and supporting an enriched pediment. The doorway is on one side, and is also enriched with Ionic pilasters and an entablature, the tympanum of which has the arms of the Savings Bank. The bank is entered through a vestibule and a panelled and carved doorway leading to an interior measuring 11 ft. by 32 ft. The walls have a panelled dado of oak. The contractors were:—James Binny & Co., masons; John Scott & Son, joiners; James Laburn, plasterer; David Hutcheson, slater; David Brown, plumber; J. Mackay & Son, painters; David Keay, heating engineer; Thomas Russell, ornamental ironworker; and Chatwood, strong-room and safe manufacturers. Mr. Peter Barron was the clerk of works, the architects being Messrs. Johnston & Baxter.

NEWSPAPER OFFICES, SOUTHAMPTON.—New premises are now being erected in Above-Bar-street, Southampton, for the proprietors of the *Hampshire Advertiser*. The frontage will occupy a space of 35 ft. 6 in., whilst the depth will be 244 ft., the work being carried out in orange-coloured bricks with Monks Park stone dressings, with two piers of Robin Hood stone. The woodwork used will be wainscot oak. The flooring will be composed of wood blocks, the staircase will be of fire-proof construction, and two electric lifts will also be employed. The whole of the premises will be lit by electricity. Mr. William Burrough Hill, architect, has designed the building, and Messrs. Dyer & Sons are the contractors.

HOSPITAL, MORTON, NEAR SHEFFIELD.—The new isolation hospital at Morton was opened recently. The contract for the hospital was let for £6,000. Messrs. Lamb & Kirk, of Alfreton, and Chesterfield. The hospital is built in the form of a rectangle. There are four blocks—the administrative, fever, laundry, and isolation blocks. The architect was Mr. Bolshaw, of Southport.

DEBART BUILDING TRADE.—The history of the building trade in the city during the year shows some little improvement upon the previous year, although it has still been less satisfactory than could have been wished. In the beginning of the year large contracts were

scarce, but afterwards things improved, and a number of important works were entered upon, including the building of several warehouses and extensions to business premises in the centre of the city. The Belfast Cathedral, though formally opened by the Lord Lieutenant in June last, is still unfinished; so is the new City Hall. Work is going on at both, but their completion is, of course, a good way in the future.

BRADFORD BUILDING TRADE.—Complaint is made that the building trade in Bradford has been very depressed during the past year, and especially in the last few months. In the opinion of a prominent member of the trade, the depression has not been so acute for nearly twenty years past. Amongst local builders, the belief prevails that practically all classes of houses have been overbuilt. In the trade there is, no doubt, some little apprehension as to the extent to which municipal enterprise may go in the matter of providing working-class dwellings, and it is evident that the effect of the scare created by the Faxeet-street scheme has not yet passed away. At present there is a disposition to obtain, if possible, a statement of the policy of the Corporation on this subject before further speculation is proceeded with. There is plenty of land in the market at reasonable prices, and it is simply waiting for the trade of Bradford to improve, and then no doubt a period of renewed activity will set in. During the earlier part of the year the properties most in demand have been small through houses. The rental of no more than four a week, and a fairly good number of these have been erected.—*Yorkshire Observer*.

BATTS, EASTBOURNE.—On the 4th inst. the Mayor of Eastbourne opened the new Corporation swimming and slipper baths which have been erected in Motcombe-lane, Old Town. The new twelve slipper-baths for men, and three for women, and a shower-bath. The swimming-bath is 60 ft. long and 24 ft. broad, with thirty-six dressing-boxes. The building was designed by the Borough Surveyor, Mr. W. Chapman Field.

STAINED GLASS AND DECORATION.

WINDOW, LEVEN CHURCH, FIFE.—A three-light east window has just been executed and fixed at Leven church by Messrs. Percy Bacon & Brothers. The centre light contains three figures, the top depicting Our Lord in Majesty, with Moses and Elias in the two spaces below, while on each side in the outer lights are St. Peter and St. Paul; under the two latter are angels bearing scrolls with texts.

FOREIGN.

FRANCE.—The Municipal Council of Paris has determined on the establishment of an "Ecole des Arts Appliqués à l'Industrie," in the same locality and under the same management as the *Bernard Palissy* School, near the Hôtel des Sociétés Savantes. There is to be opened, on the 22nd inst., an exhibition of drawings and photographs of the principal works executed in concrete-steel, in France and in other countries, during the last year.—The jury in the competition for new schools at Charenton have awarded the first premium to M. Chas. Morice, architect of Paris.—The Municipality of Paris has decided on the construction of three new fire brigade barracks.—The old Château of Dieppe has been classed among the Monuments Historiques, and is to be converted into a local museum.—Public works are to be undertaken at Grenoble at a cost of three and a half million francs. The rebuilding of the market-halls forms a portion of the scheme.—The Municipality of Nancy have decided on the construction of a large new theatre, at a cost of two million francs.—The Government has given its approval to a scheme for transferring the lake of Geneva near Marseilles, into a harbour of refuge. The cost is estimated at about 5,500,000 francs.—M. de Tizio, who holds an important position in the Department of Fine Art, has been appointed Curator of the Cernuschi Museum in place of M. Causse, who has retired.—The death is announced, at the age of 88, of M. Eustache Bernard, sculptor. He had exhibited many busts and medallions at the Old Salon, and took part in the restoration of the cathedral of Chartres and the Palais de Justice of Grenoble.

GERMANY.—The new Commercial Schools at Cologne are to be built from plans by Dr. E. Vordemann, at a cost of 2,400,500 marks. The plans of MM. Siemens & Halske for a workmen's colony at Charlottenburg have been accepted; they provide for 1,200 inhabitants.—The Salvator Church at Duisburg,

which dates from the XVth century, has been restored under the direction of Herr Otter.—The theatre at Brunswick, which has been rebuilt under the direction of Herr Seeling, is completed.—The new Law Courts at Kreuznach, from plans by Herr Thoemer, have been completed.

SWITZERLAND.—The collection of household furniture and ornaments from the Engadine, made by Mr. R. Campbell and Herr Nikolaus Hartmann, is to be placed in a suitable museum, to be built for the purpose at St. Moritz.—A new church is to be built at Baltsch, from plans by MM. La Roche, Stahelin, & Co., of Basle.—The foundation of the new historical museum at Geneva was laid on September 17; the museum is being built from the designs of Herr Max Camoletti.—The Botanical Museum at Geneva, from plans by Herr Junot, has been completed at a cost of 195,000 francs.—The Orphanage at Rathsau, which was burned down in May, 1903, has been rebuilt under the direction of Herr Müller, at a cost of 300,000 francs.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The Canadian Government have opened a City Branch Office at 78, Basinghall-street. The office is supplied with Canadian books of reference, directories, reports, etc.; and ultimately it is proposed to install a small display of the leading Canadian products and resources. Messrs. Neill & Sons, architects, of Leicester, and Kettering, have dissolved partnership, and in future Mr. Howard H. Thomson will practice at the Leicester office, Halford-chambers, Halford-street.—In consequence of his recent appointment as Surveyor to the City of London, Mr. Sydney Parks, architect and surveyor, has transferred his practice to Mr. E. Greenop, of Falcon-court, 32, Fleet-street, who will continue it in conjunction with his own practice.—Messrs. Penman & Co., boiler makers, etc., Glasgow, have appointed Messrs. Andrew Brown & Co., 110, Cannon-street, E.C., as their London agents.—Mr. W. Wonnacott's new address was incorrectly given in our last as "119, Piccadilly." It should have been "199."

ARBITRATION CASE re MANCHESTER SCHOOL OF TECHNOLOGY.—Sir William Emerson, the arbitrator appointed to settle differences existing between Messrs. Robert Neill & Sons, builders of Manchester, and the Manchester Corporation, which had arisen in connexion with the erection of the School of Technology, has directed that the Corporation should pay to Messrs. Neill, the sum of 19,920l., which sum was to be a full satisfaction of their claims against the Corporation to pay their own costs, and also the costs of Messrs. Neill, which were to be taxed. Mr. William Emerson also awarded and fixed his own fees and costs, including the fees of Mr. Young, a London quantity surveyor, at the sum of 988l., and directed that such sum should also be paid by the Corporation. For the purpose of reaching the above award and the report of the Deputy-Town Clerk thereon, a special meeting of the Manchester Education Committee was held at the School of Technology on the 3rd inst., Alderman Sir James Hoy presiding. Mr. J. H. Reynolds (Principal of the school) read the report, which stated that, under the contract, dated July 19, 1896, between Messrs. Robert Neill & Sons and the Corporation, and the supplemental agreement, dated August 16, 1902, between the aforementioned parties, an arbitration had taken place for the settling of certain differences which were partly in connexion with the price to be paid for extra work, and partly in respect of claims put forward by Messrs. Neill for damages alleged to be due to delay caused by the Corporation and other contractors of the Manchester Corporation, and certain other matters incidental to the work. Messrs. Neill's claims, as formulated by them, consisted of the items amounting to 27,427l. 6s., together with the sum of 11,055l. 13s. 3d., being the difference between the claim for extra work at the price proposed by them, these amounts altogether making a total of 38,482l. 19s. 3d. The question of price was referred by consent of all parties to Mr. Morgan H. Young, a London quantity surveyor, who sat at the School of Technology on eleven days in May, and was assisted in his investigation by Mr. Windsor, quantity surveyor for the committee, and Mr. Dale, for Messrs. Neill & Sons. It was arranged that Mr. Young's findings should be embodied in the award to be made by Sir William Emerson. Sir William Emerson visited Manchester and heard the parties with respect to the claim, and gave his award as detailed above. The chairman moved that the report read be approved, and

that, under the direction of the Town Clerk, the sums of 19,902*l.* and 988*l.* referred to therein be paid. This was seconded by Councillor Fildes, and carried.—*Manchester Courier.*

SALE OF CARVINGS BY GRINLING GIBBONS.—Owing to the operations following on the recent sale of Wootton Wawen Hall, near Stratford-on-Avon, the very characteristic carving in sycamore wood of game, fruit, etc., by Grinling Gibbons, which adorned the old drawing-room fireplace, was put up to auction last week at Messrs. Knight, Frank, & Rutley's galleries, and was purchased by Messrs. White, Allom, & Co. for 175 guineas.

PROSTERLEY MARBLE.—The directors of the Harehope Mining and Quarrying Company have presented to the American Government the specimens of "Prosterley marble" which they sent from the county of Durham to the St. Louis Exhibition. The gift is accompanied with a collection of photographs in illustration of those portions of the several churches in England, in the building of which the marble has been used during successive centuries—amongst them being Durham Cathedral.

WAR MEMORIAL, LICHFIELD CATHEDRAL.—A new window has been inserted in the south transept of Lichfield Cathedral, to commemorate the services of the 1st Battalion of the South Staffordshire Regiment (originally raised in that city more than 200 years ago as the 38th Foot), and of their comrades of the Militia and Volunteer Battalions, in the South African campaign 1899-1902. The stained glass is by Mr. C. E. Kempe; the window, having three lights, was designed after the Early English style by Mr. John Oldrid Scott, architect to the Cathedral, and has been inserted in place of a debased Perpendicular window.

ROYAL SANITARY INSTITUTE.—A prize, under the name of the Henry Saxon Snell Prize, has been founded by the Institute to encourage improvements in the construction or adaptation of sanitary appliances, and is to be awarded by the Council at intervals of three years, the funds being provided by the legacy left by the late Henry Saxon Snell, F.R.I.B.A. The first prize, which will consist of 50*l.* and a medal of the Institute, is offered in the year 1905 for an essay on "Domestic Sanitary Appliances, with Suggestions for their Improvement." Essays must be delivered before 4 p.m. on or before March 30, 1905, addressed to the Secretary of the Royal Sanitary Institute, 72, Margaret-street, W., from whom all further particulars may be obtained.

Legal.

EMPLOYERS' LIABILITY ACT:

QUESTION OF HORSES IN BUILDERS' WORK.

At the Brompton County Court, on Monday, before Mr. Clement Lloyd—sitting as deputy-judge—and a jury, Edward Saunders, carpenter and joiner, living at Croydon, brought an action, under the Employers' Liability Act, against Messrs. Lole & Lightfoot, builders and contractors, Manresa-road, Chelsea, S.W. The plaintiff's claim was in respect of personal injuries, said to have been sustained owing to negligence on the part of the defendants or their servants.

Mr. W. Frampton, counsel, appeared for the plaintiff, and Mr. W. Shakespeare, counsel, for the defendants.

Plaintiff's counsel stated that his client had been employed by the defendants for about seven years, and, on September 5 last, was told to go with a cartload of office fittings to be fixed at Thames-street. The foreman, Nicholls, told the plaintiff to sit at the back of the cart, and while Nicholls was talking to someone at the side of the cart, the driver called out:—"You must be quick; I can't hold this horse," or words to that effect. A second later the animal dashed forward, slued the tail-board round, throwing the plaintiff violently into the road. By the accident the plaintiff sustained a fractured thigh, a sprained hand, and a cut face. For about thirteen weeks the man was detained at St. George's Hospital, and he was still unable to do any work. Counsel submitted that the negligence on the part of the defendants consisted in using in the business, a horse which had not been properly exercised, and which was restive and dangerous for the work.

The plaintiff bore out his counsel's statement.

In cross-examination, he said he knew nothing about horses, and could not say that the animal in question was vicious.

The defendants' carman, called for the plaintiff, said that the horse was not at all restive, and never showed any vice.

For the defence, Mr. Richard Lole, of the defendant firm, said that, although the horse was of high spirits, it had no vice. No complaints had ever been made to him about the animal.

A former carman of the defendants said he never had any difficulty in controlling the horse in question.

Other evidence of similar character having been given.

The jury found that there was no negligence on the part of the defendants so far as the use of the horse was concerned; that there was negligence on the part of the driver, who was, they considered, "the main cause" of the accident; that there was negligence on the part of the defendants in employing such a driver.

Looking upon this as a verdict for the plaintiff, the jury assessed the damages in his favour at 50*l.* As, however, the driver—whose negligence the jury considered to be the real cause of the accident—was a fellow servant, to whose orders the plaintiff was not bound to conform, he (plaintiff) could not recover under the Act. This was pointed out by his Honour. It was understood that the plaintiff would apply for compensation under the Workmen's Compensation Act at a later date.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

24,839 of 1903.—B. K. WEBBER: Windows.

A sash window, wherein to the lower part of each side of the frame of each window sash is attached a weighted cord, chain, or equivalent, that extends from the sash upwardly within a groove in the face of the adjacent pulley stile and over a guide pulley.

638 of 1904.—G. F. BATES: Building Construction or Brickwork, and Bricks and Blocks, or Quarries for use therein.

This invention relates to building construction or brickwork, and to bricks to be used exclusively as headers and blocks or quaries, to be used exclusively in lieu of stretchers. According to this invention, grooved bricks or headers are provided, which are arranged in series to carry between them transversely-disposed blocks or quaries with the edges or tongue of which they interlock, and with which they form continuous cavities, which may be filled up with cement, concrete, or other filling material, by which the whole brickwork may then be strengthened or enforced, or which may be left empty as an air insulation or for the purposes of ventilation, drainage, or for other purposes, or incidentally also for economy, and for minimising the weight of the structure.

3,233 of 1904.—A. S. MOORE: "Emergency" Doors for Theatres, and the like.

Means for securing emergency doors in theatres and other buildings, comprising a spring supported platform pivoted at its rear edge in the floor of the building, and having in its outer edge a groove adapted for engaging with the bottom of the door; the weight of a person standing upon the platform having the effect of depressing the free end of the latter, and releasing the door.

6,635 of 1904.—G. GRONDAL: A Kiln for Burning Cement or Reducing or Calcining Ores.

A kiln for burning cement or reducing or calcining ores, comprising a hollow rotating cylinder or drum slightly inclined to the horizon, a furnace located above the upper end of the cylinder, a shaft located under the lower end of the cylinder, a device for making a gaseous mixture at the lower end of the cylinder, and a feeding device under the said furnace conveying material therefrom to the cylinder, the construction of the said furnace and shaft being such that air, gas, or combustion products may pass from the lower part to the upper part thereof in horizontal passages leading to and fro therefrom.

22,393 of 1904.—M. R. VANDERKLOOT: Piling.

A section or unit for sheet piling, consisting of two channel bars secured together face to face in parallel relation, but offset laterally with respect to each other, each channel bar being provided with longitudinal parallel flanges on its opposite faces from the other channel; and one of said flanges being a plain flange or lip, while the other is a hooked flange corresponding in inner contour to the exterior outline of the plain flange.

24,574 of 1904.—C. SCHMUCKER: Rain-water Pipe Bends.

A rain-water pipe bend, composed of two longitudinal halves, of which one of the said

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

halves is formed with a groove or recess along its horizontal edges into which the corresponding edges of the other half are fitted and fixed by soldering or brazing.

3,345 of 1904.—G. DUBUIS: Baths.

An electric light bath, consisting of a metal bath of suitable size and construction, provided with sides, top, and end pieces to form a cover for the bath, said sides being preferably hinged or pivoted to the sides of the bath or to supports or standards so as to fold over the bath, and with the top and end pieces to enclose it, said sides, top, or end pieces, or all of them having electric lights arranged on their inner sides, and the top and one of the end pieces having an aperture for the patient's head.

3,381 of 1904.—A. C. WRIGHT: Screws or Bolts for Use with Roof Gutters.

This invention relates to screws or bolts for use with roof gutters or spouts. In the manufacture of bolts in accordance with this invention for use with roof gutters or spouts, the blanks are made preferably from malleable cast-iron, and are provided each with a mushroom type or other slotted head, and with a washer forming an integral part of the blank.

3,390 of 1904.—W. WELSBY: Draught Excluders for Doors.

A draught excluder, comprising a strip suspended by wires or links from a tumbler lever, the heavy end of which is raised by an incline on the door jamb when the door is closed, the strip being raised when the door is opened by the same lever, the heavy ended lever or bolt having double inclines and notches combined with a holding device also having double inclines and holding notches, and a means for holding the tumbler lever or bolt in its forward position.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples sent to or left at his office, unless he has specially asked for them.

Letters or communications (beyond mere news items) much have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

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Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

MEETINGS.

FRIDAY, JANUARY 13.

Institution of Civil Engineers (Students' Meeting).—Mr. James Selwyn on "Theory of Electricity and Magnetism." 8 p.m.

Junior Institution of Engineers (Westminster Palace Hotel).—Lecture (illustrated by Experiments and Lantern Slides) on "The Theory of the Incandescent Mantle," by Professor Vivian B. Lewes. 8 p.m.

MONDAY, JANUARY 16.

Royal Institute of British Architects.—The President's "At Home," No. 9, Conduit-street, Regent-street. From 8.30 to 11 p.m.

Surveyors' Institution.—Mr. A. R. Stenning and Mr. W. Meuzies on "Urban and Rural District By-laws, with suggested Amendments." 8 p.m.

Liverpool Architectural Society.—Mr. E. Bertram Kirby on "The Building of York Minster," illustrated by lantern slides. 6 p.m.

TUESDAY, JANUARY 17.

Institution of Civil Engineers.—Mr. L. F. Vernon-Harcourt, M.A., on "The River Hooghly." 8 p.m.

Institute of Sanitary Engineers, Ltd.—7 p.m.

Northern Architectural Association.—Mr. R. P. S. Twissell on "The Evolution of Domestic Architecture," illustrated by lantern slides. 8 p.m.

WEDNESDAY, JANUARY 18.

Builders' Foremen and Clerks of Works' Institution.—Annual meeting of the members. 8 p.m.

Institution of Civil Engineers.—Students' visit to the foundry of Messrs. E. & F. G. Co., Ltd., Nine Elms Ironworks, Nine Elms-lane, S.W. (Assemble at the works.) 8 p.m.

Edinburgh Architectural Association.—Mr. M. Buchan on "The Electric Lighting of a Country House." 8 p.m.

Glasgow Philosophical Society (Architectural Section: Joint Meeting with Architectural Association).—Professor E. Bourdon on "The Education of the Architect." 8 p.m.

THURSDAY, JANUARY 19.

Society of Antiquaries.—8.30 p.m.

COMPETITIONS AND CONTRACTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered.
*Sketch Plans for Four Artisans' Cottages	Wembley U.D.C.	3l. 3s.	Feb. 8
*Designs and Plans for New Public Elementary School	C.B. of Preston.	50s., 30l., and 30s.	Feb. 23
*Plans for New Billiard Room, Library, &c.	D. H. Huber-Waring	Not stated	No date.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Paint, etc., Old Nurses' Home, Withington Wkhsa.	Chorlton Guardians	Porter at Union Offices, All Saints, Manchester.	Jan. 13
Sinking Test Borehole	Wing R.D.C.	Saunders & Walker, Engineers, Milton-chbbs, Milton-st., Nottingham	do
Dutch Barn, Chester Court Hall, Selby	Rotherham R.D.C.	Thompson & Kirtou, Architects, Exchange-bldgs., Lowgate, Hull	Jan. 13
Sewage Connections, Catcliffe	Brackley R.D.C.	J. Platts, Surveyor, High-street, Rotherham	Jan. 11
Alter, etc., Blind Institution, West-street, Sheffield	do.	E. Winder, Architect, Corn Exchange-chambers, Sheffield	do
Hartshill Stones, Granite, and Slag	do.	W. J. Treadwell, District Surveyor, Middleton Cheney, Banbury	do
Slag	Mirfield Colliery Co.	do.	do
Thirty Beehive Coke Ovens	Oulton Hospital Committee	Dark Lane Colliery	do
Chimney, 100 ft. high	Woodstock R.D.C.	Olley & Howard, Architects, 5, Queen-street, Great Yarmouth.	Jan. 18
Works at Isolation Hospital, Oulton	Kent Education Committee	A. H. Higgs, Clerk to Council, Woodstock	do
Hartshill Stone	Barry U.D.C.	G. A. Birkenhead, Architect, Caledonian-chambers, Cardiff	do
Playgrounds, etc., High Brooms New Schools	Glanorgan C.C.	At Blengarn Council School	do
Boys' School at Romilly-road, Barry	Guildford Guardians	E. L. Lunn, Architect, 36, High-street, Guildford	do
Entrance, R., etc., Nanthir Council Sch., Biancarv.	Salford Education Committee	Director of Education, Chapel-street, Salford	do
Foundations and Basewalls of Casual Wards, etc.	Beugal and N.W. Ry. Co., Ltd.	A. Izat, 237, Gresham House, Old Broad-street, London, E.C.	do
Desks and School Furniture	Hull Education Committee	J. T. Riley, Education Offices, Albion-street, Hull	do
40 tons of White Lead	Devonport Town Council	J. F. Burns, Borough Surveyor, 29, Ke-street, Devonport	do
Furnishing at School of Art, Anlaby-road	Hendon U.D.C.	Council's Engineer, Council Offices, Hendon, N.W.	do
Dwelling House, O'Donnell-street Site	Secretary of State for India	Director General of Stores, India Office, Whitehall, S.W.	Jan. 17
*Making-up Edgware-road	Southern Mahatras Ry. Co., Ltd.	E. Z. Thornton, Secretary, 48, Queen Anne's-gate, S.W.	do
Spikes and Bearing Plates for Rails	do.	J. Judson & Hudson, Architects, Oakworth, near Kelghley	do
600 pairs of Wheels and Axles	Hambleton R.D.C.	F. Smallpiece, 138, High-street, Guildford	do
Orna. Pond, etc., at Boston-hill, nr. Hebdon Bridge	Bombay Garads, etc., India Ry. Co.	T. W. Wood, Sec., Gloucester-hs., Blashopgate-st. Without, E.C.	do
Scavenging	Great Western Railway Co.	Engineer, at North Station	do
*Notices	Croydon Guardians	H. List, Clerk, Union Offices, Mayday-rd., Thornton Heath, Surrey	do
Extension of Goods Offices at Llanely Station	Great Western Railway Co.	Engineer at Wolverhampton Station	do
600 tons of Unbroken Guernsey Granite	Spenny-moor U.D.C.	C. R. Spencer, Surveyor, Council Offices, Spenny-moor	do
Earthwork near Wolverhampton	Bermondsey Borough Council	F. Ryall, Town Clerk, Town Hall, Spa-road, S.E.	do
Kerbing Works, Spenny-moor, Durham	Manchester District Council	Council's Engineer, Dyne-road, Kiburn, N.W.	do
3,500 tons of Aberdeen Granite Pitchers	do.	A. J. Murgatroyd, Architect, 25, Strutt-street, Manchester	Jan. 18
*Construction of Sewers, etc.	East Indian Railway Co.	C. W. Young, Secretary, Nicholas-lane, London, E.C.	do
Dressing Rooms at Recov. Wds., Crumwell Wkhsa.	Meriden R.D.C.	A. Seymour, Clerk, 11, Priory-street, Coventry	do
Technical Instruction Room at Swinton Schools	Manchester Clean Committee	E. W. Dixon, Engineer, 14, Albert-street, Harrogate	do
Spiral Springs, etc.	Harrogate Corporation	J. Hartley, Architect, Skipton	do
Granite or Similar Stone	Skipton Co-operative Society, Ltd.	H. E. Stratton, Clerk, R.D.C. Offices, Pyle-street, Newport, I.W.	do
Paints, etc.	Isle of Wight R.D.C.	do.	do
12 Peestocks and 58 Sluice Valves, etc.	Fulham Borough Council	F. Wood, Borough Engineer, Town Hall, Fulham	do
Five Cottages, Duke-street, Skipton	Glanorgan C.C.	County Police Station, Neath	do
Pipes for Water Mains, Beunhridge Waterworks	Manchester Gas Committee	J. G. Newbigging, Engineer, Rochdale-road Station, Manchester	Jan. 19
Excavating for and Laying Pipes	Sutton (Surrey), U.D.C.	E. M. Bruce Vaughan, Architect, Cardiff	do
727 yds. of Sewer Works	Bury and District Joint Water Board	C. Chambers Smith, Sutton, Surrey	do
Turf for Open Spaces	do.	J. Cartwright, Engineer, Peel-chambers, Bury, Lancs.	Jan. 20
Widening and Improving Olyn-Nash-road	Rochdale Canal Co.	do.	do
Excavating, etc., Gaythorn Station, Elevated Ry.	Carlisle Board of Guardians	80, Dale-street, Manchester	do
Scout Moor High-Level Reservoir	Belfast R.D.C.	E. Armstrong, Architect, 24, Bank-street, Carlisle	do
Ogden Reservoir	Rhondda U.D.C.	J. W. Robb, Clerk, Union Workhouse, Belfast	do
Stores	Lancashire C.C.	O. Thomas, Engineer, Gas & Water Offices, Centre, R.S. Co., Glam.	do
Drainage at Fussell Workhouse	Middleton Cheney R.D.C.	J. Witter, Architect, Elgin	do
Fencing, etc., of New Burial Ground, Llanymonay	Rugby U.D.C.	Warren & Stuart, Engineers, 94, Hope-street, Glasgow	Jan. 21
700 yds. Water Mains at Blancydach	Bridges and Roads Com., Keat C.C.	W. J. Thackray, Architect, Surveyor, Middleton Cheney, Banbury	do
Workmen's Houses, Hill-street, Elgin	Caledonian Railway Co.	E. J. Williams, F.R.I.B.A., 17, Quay-street, Cardiff	do
Hartshill Stones, Granite, and Slag	Billiclary Guardians	D. G. Macdonald, Surveyor to Council, Rugby	do
Weslevan Chapel at Hartshill, Leeds	Whitley and Monkseaton U.D.C.	County Surveyor, Maidstone	do
Additions, etc., to Pendoylan National Schools	Romford U.D.C.	Engineer, Buchanan-street Station, Glasgow	Jan. 23
Broken Stone for Repair of Highways	Derwent Valley Water Board	C. E. Lewis, Clerk, New-road, Brentwood	do
Eight Heavy Motor Cars	Beckenham U.D.C.	J. Moore, Surveyor, Council-buildings, Whitley Bay	do
Buildings in the Concourse at Glasgow Central Stn.	Camberwell Borough Council	H. T. Ridge, Council Offices, Market-place, Romford	do
Cottage Homes for Children at Billerica	Foleshill R.D.C.	O. B. Steward, Clerk, Bamford, via Sheffield	do
Team Labour on Streets and Roads	Leeds Corporation	Council's Surveyor, Council Offices, Beckenham	do
Labour and Cartage for Scavenging	Northumberland Education Comm.	Borough Engineer, Town Hall, Camberwell, S.E.	do
Street Works, Romford	South Indian Railway Co., Ltd.	A. J. Metcalfe, District Surveyor, West-street, Bourne	Jan. 24
C.I. Pipes, Derwent Aqueduct (Contract No. 4)	do.	City Engineer's Office, Leith, High-street-chambers, Coventry	do
*Roadmaking, etc.	Ilford U.D.C.	C. F. Bean, County Surveyor, The Moor Hall, Newcastle-on-Tyne	do
*Pav. Rdys., Hollington & Sultan St. w. Mastic Asp.	Croydon Corporation	C. F. Dawson, Surveyor, Public Offices, Barking	do
Materials	Bromley Borough Council	H. W. Notman, 55, Gracechurch-street, London, E.C.	do
Infectious Diseases Hospital, Exhall	Tottenham U.D.C.	do.	do
Doors and Screens to Dressing Boxes at Baths	do.	R. Morton Rigd, Architect, Arnside, near Kendal	do
School at Shiremoor, Earsdon U.D.C.	Sub-Committee for Winsford District	H. Shaw, Surveyor, Town Hall, Iford	do
100 Steel-covered Goods Wagons	Edlington U.D.C.	Borough Road Surveyor's Office, Town Hall, Croydon	do
200 pairs of Spoke Wheels and Axles	do.	Borough Engineer, Municipal Offices, Bromley, Kent	do
400 Laminated Bearing Springs	M.B. of Chelsea	Council's Engineer, 712, High-street, Tottenham	do
North Aisle, St. James' Church, Arnside, nr. Kendal	do.	do.	do
Extensions to Switchboard Gallery, etc., Ley-street	do.	H. Beswick, County Architect, Newgate-street, Chester	Jan. 25
Street Works, Thornton Heath and Upper Norwood	do.	J. Somers, County Sur., County Offices, St. Mary's-gate, Derby	do
*Sewering, etc., Aldermoor and Broadwood roads	do.	G. Kennerley, F.S.L., 73, Colmore-row, Birmingham	do
*Refresh. Pav., etc., Bruce Cha., Downhills, Ch'naia Pk.	do.	J. Vickers-Edwards, County Architect, County Hall, Wakefield	do
*Mak'g-up Crowland, etc. Roads and Woodside-gdns.	do.	do.	do
Alterations, etc., to Schoolbuildings, High-st., Over	do.	do.	do
Look-up at Tidwell	do.	do.	do
Council House and Library	do.	do.	do
Repairs at the Ferry Eryston, New Eryston, Schools	do.	do.	do
Conversion of Laundry-room into Classroom	do.	do.	do
Repairs at the Ferry Eryston, Ferry-bridge, School	do.	do.	do
*Annual Contracts	do.	do.	do

LONDON.—For erecting a boat shed and workshops at South Wharf, Trinity-street, Rotherhithe, S.E., for the Metropolitan Asylums Board. Messrs. T. W. Aldwinckle & Son, architects, 20, Denman-street, London Bridge, S.E.:—

E. P. Bulled & Co.	£1484	0	0
J. A. Renwick	1475	0	0
R. L. Tonge & Co., Ltd.	1591	6	2
W. Johnson & Co., Ltd.	1298	0	0
W. Reason	1290	0	0
Johnson & Co.	1289	0	0
Aldridge & Son	1189	19	0
Morley & Meyer	1188	6	0
W. Lawrence & Son	1044	0	0
W. J. Rendshaw	1023	0	0
H. Kent	1012	5	0
J. Shelbourne & Co.	1005	0	0
Thomas & Edge	997	0	0
A. White & Co.	978	0	0
C. Cruise & Co.	954	0	0
W. Harbrow Iron Building Works	940	0	0
B. E. Nightingale, Albert Embankment, S.E.*	875	0	0

NEWHAVEN.—For erecting an isolation hospital, etc., Lewes-road, for the Urban District Council. Mr. F. J. Rayner, architect, 34, Meeching-road, Newhaven:—

A. White & Sons	£7,353	10	Field & Co.	£5,893	0
J. G. Pickard	6,400	0	Peerless, Dennis,		
J. Longley & Co.	6,125	0	& Co.	5,760	0
R. Cooke & Sons	6,045	0	Norman & Burd	5,602	0
J. Jarvis & Son	6,000	0	M. Woolger	5,640	0
I. Waters & Sons	5,998	0	Godfrey Bros.	5,378	12
P. d'Almeida &			J. Martin	5,200	0
Hutchinson	5,935	0	C. Cooke New-		
Hockley & Co.	5,900	0	haven*	5,085	0
F. Miskin	5,835	0			

PRESTON.—For road works, Kingfisher-street, etc., for the Corporation:—

<i>Kingfisher-street from St. George's-road to Holmrook-road.</i>		
R. Bashall, Preston	£328	9 10
<i>Back-road, Brampton-street, and Elton-street.</i>		
Chadwick Bros., Preston	£144	12 4

SWINTON.—For sewerage works extension, etc., for the Salford and Pendlebury Urban District Council. Mr. H. Entwistle, Surveyor, Council Offices, Swinton, Manchester:—

Sewage Works Extension.			
Edmunds & Co.	£4,181	3	0
M. O'Neil	3,325	17	8
M. Naylor & Sons	2,888	19	0
R. Napier & Sons	2,830	14	0
Johnson & Hindley	2,880	0	0
G. W. Bell	2,648	0	8
A. Graham & Sons	2,470	0	0
J. Pyron	2,465	10	0
R. Lomax	2,405	13	6
W. Jovett	2,386	0	5

For Sewer.			
M. O'Neil	£5,751	13	8
P. & S. Kear-	4,944	12	0
ley	4,112	8	9
Johnson & Hindley	4,009	10	6
Edmunds & Co.	3,995	14	8
W. Jovett	3,938	8	0
G. A. Watson & Son	3,758	7	0
M. Naylor & Sons			

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PURLEY.—For the erection of billiard room in Brighton-road, Purley. Mr. Frank Windsor, architect, 1, High-street, Croydon:—

W. Walker, Purley	£580	W. Pearson & Co.	£435
W. Walker, Purley	£490	W. Pearson & Co.	£420

PURLEY.—For the erection of stable in Brighton-road, Purley. Mr. Frank Windsor, architect, 1, High-street, Croydon:—

W. Walker, Purley	£580	W. Pearson & Co.	£435
W. Walker, Purley	£490	W. Pearson & Co.	£420

SOUTHWICK.—For the construction of surface water sewers at Fishergate, for the Urban District Council. Mr. G. W. Warr, Surveyor, Council Offices, Southwick. Quantities by Surveyor:—

J. G. Pickard	£542	0	0
J. A. East	598	3	0
Parsons & Sons	458	0	0
E. King	416	9	10
Porter & Co.	409	0	0
W. A. McKellar	358	13	0
Hove*	308	0	0

WALSALL.—For a new road from Lichfield-street to Darwall-street, etc., for the Corporation:—

H. Holloway, Bilston-road, Wolver-	£1,017
hampton*	

WALTHAMSTOW.—For alterations and additions to Gamble-road Schools, for the Walthamstow Education Committee. Mr. H. Prosser, Architect and Surveyor, Architect's Department, Education Committee Offices, High-street, Walthamstow, N.E.:—

J. Shelbourne & Co.	£5,597	Myall & Upson	£3,100
Stimpson & Co.	5,408	R. B. Nightingale	5,000
W. Shurmer & Sons	5,480	J. & J. Dean	5,871
Treasure & Son	5,404	Poster Bros.	5,822
W. Lawrence & Son	5,385	A. G. Barton	5,812
H. Knight & Son	5,355	Hammond & Son	5,778
J. & M. Patrick	5,279	W. Manders	5,550
A. G. Crisp	5,250	Rowley Bros.	5,500
Folland & Brand	5,250	R. & E. Evans	5,477
Martin, Wells, & Co.	5,119	W. J. Maddison	5,429
Canning Town*			

WEALDSTONE.—For making-up, etc., of Grant and Locket roads (up to Aberdeen-road), and Aberdeen, Stirling, and Rosalvin-crescent roads, for the Urban District Council. Mr. H. Prosser, Architect and Surveyor, Council Offices, Wealdstone. Quantities by Surveyor:—

H. Higgins	£5,979	11	2
T. Free & Sons	5,833	6	7
M. Brown	5,519	9	3
F. Powles	5,195	9	11
T. Adams	5,040	18	5
stone*	4,683	3	9

WOBURN SANDS.—For the erection of new shop and stores, for the Woburn Sands Co-operative Society, Ltd. Mr. W. B. Stonebridge, architect, Woburn Sands and Woburn:—

G. Botsford	£907	M. Fleet	£840
W. T. Sharpe	977	Miles Bros.	779
H. Gregory	945	C. Sinfeld*	763

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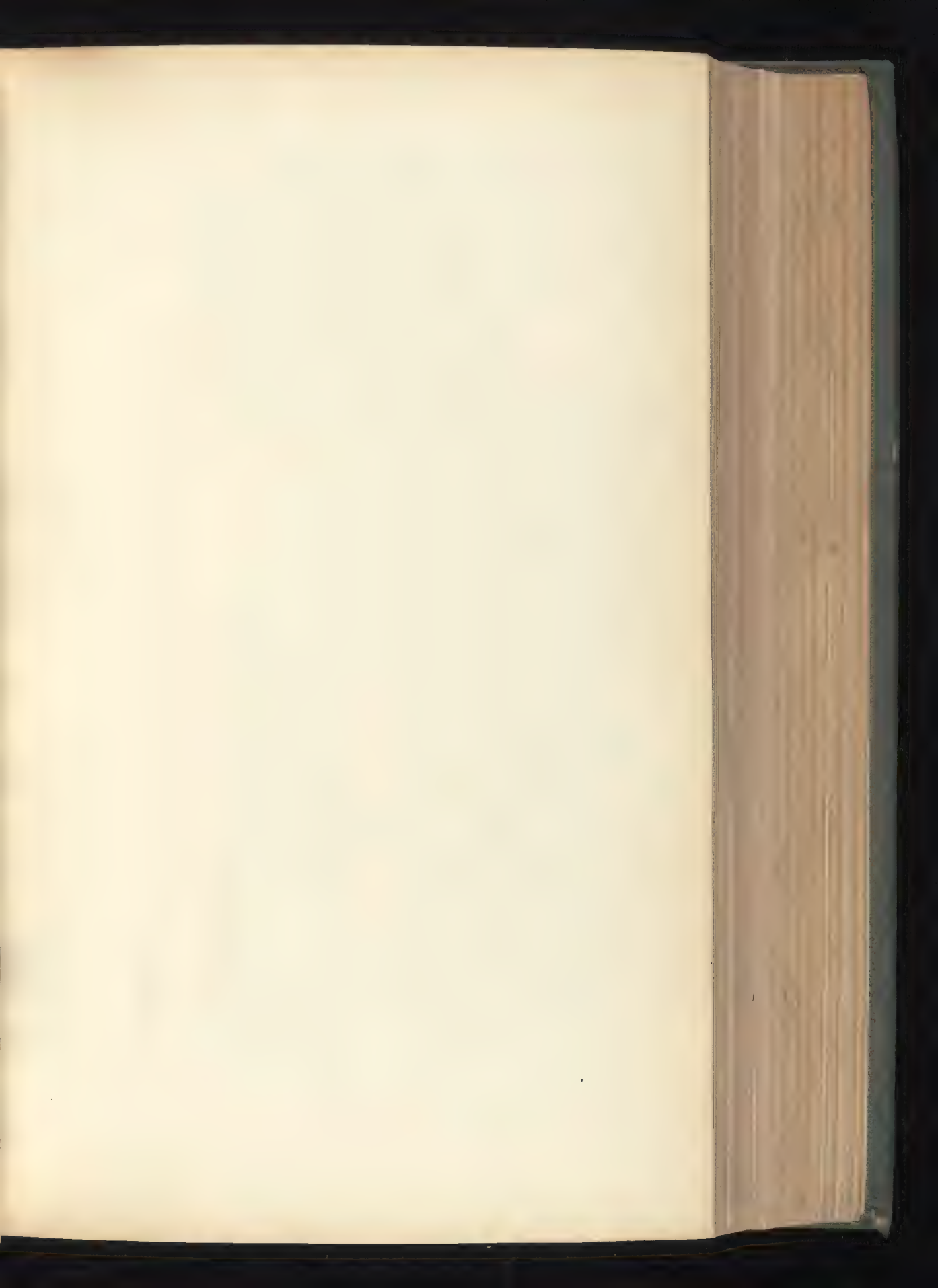
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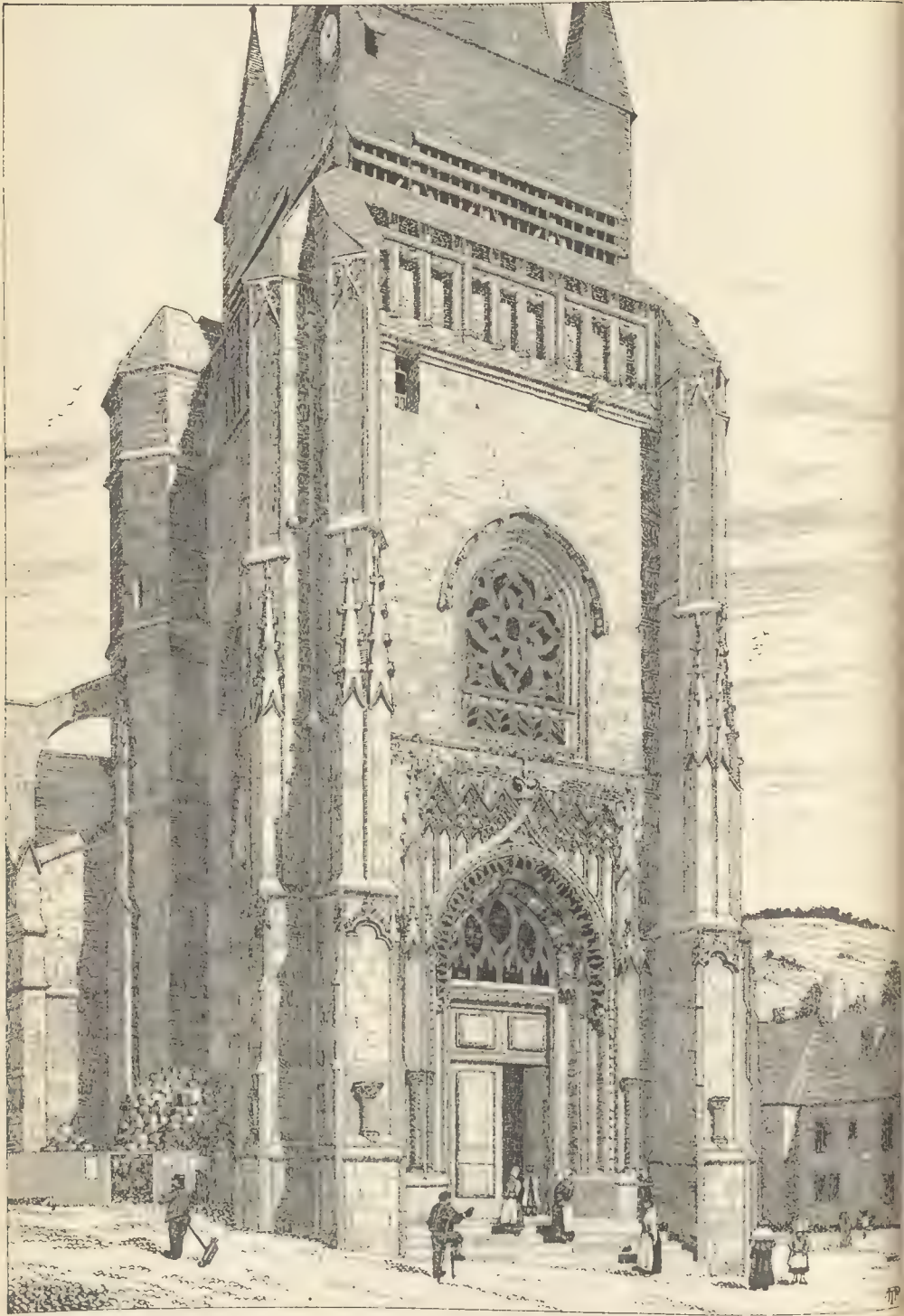
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THE CHURCH OF NEUFCHÂTEL-EN-BRAY, FRANCE DRAWN BY MR J TAVENOR PERRY
EXTERIOR.



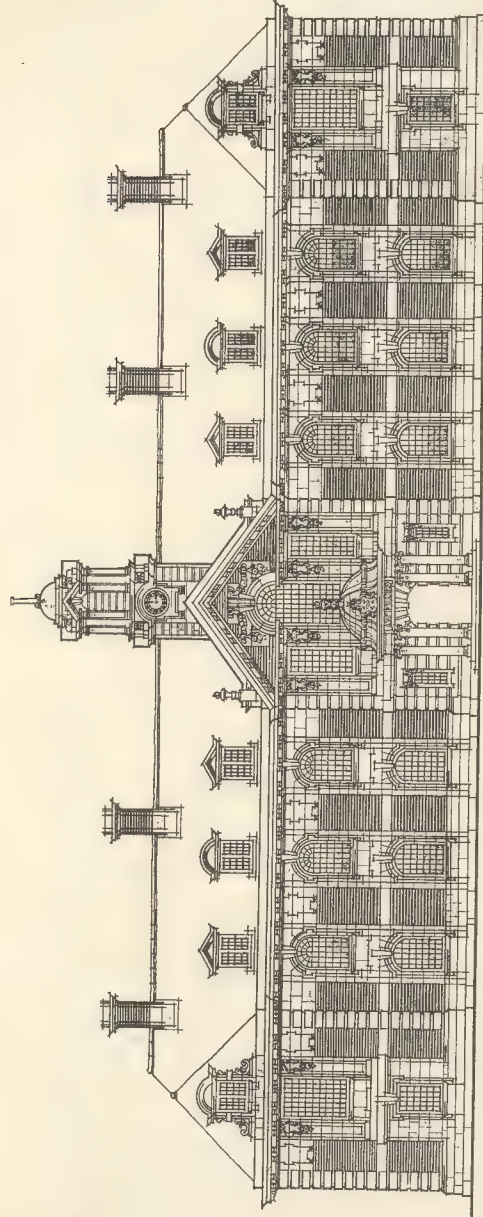
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THE CHURCH OF NEUFCHÂTEL-EN-BRAY, FRANCE.—DRAWN BY MR. J. TAVENOR PERRY.

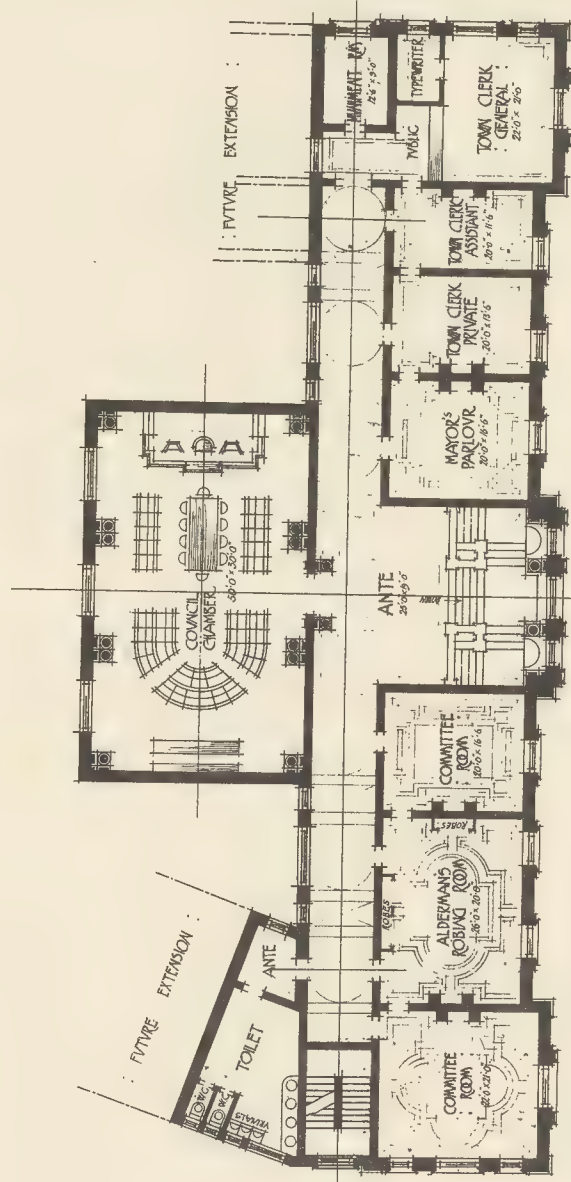
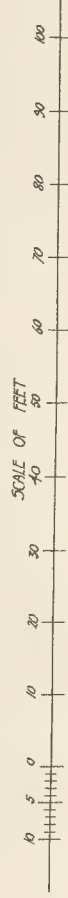
INTERIOR.



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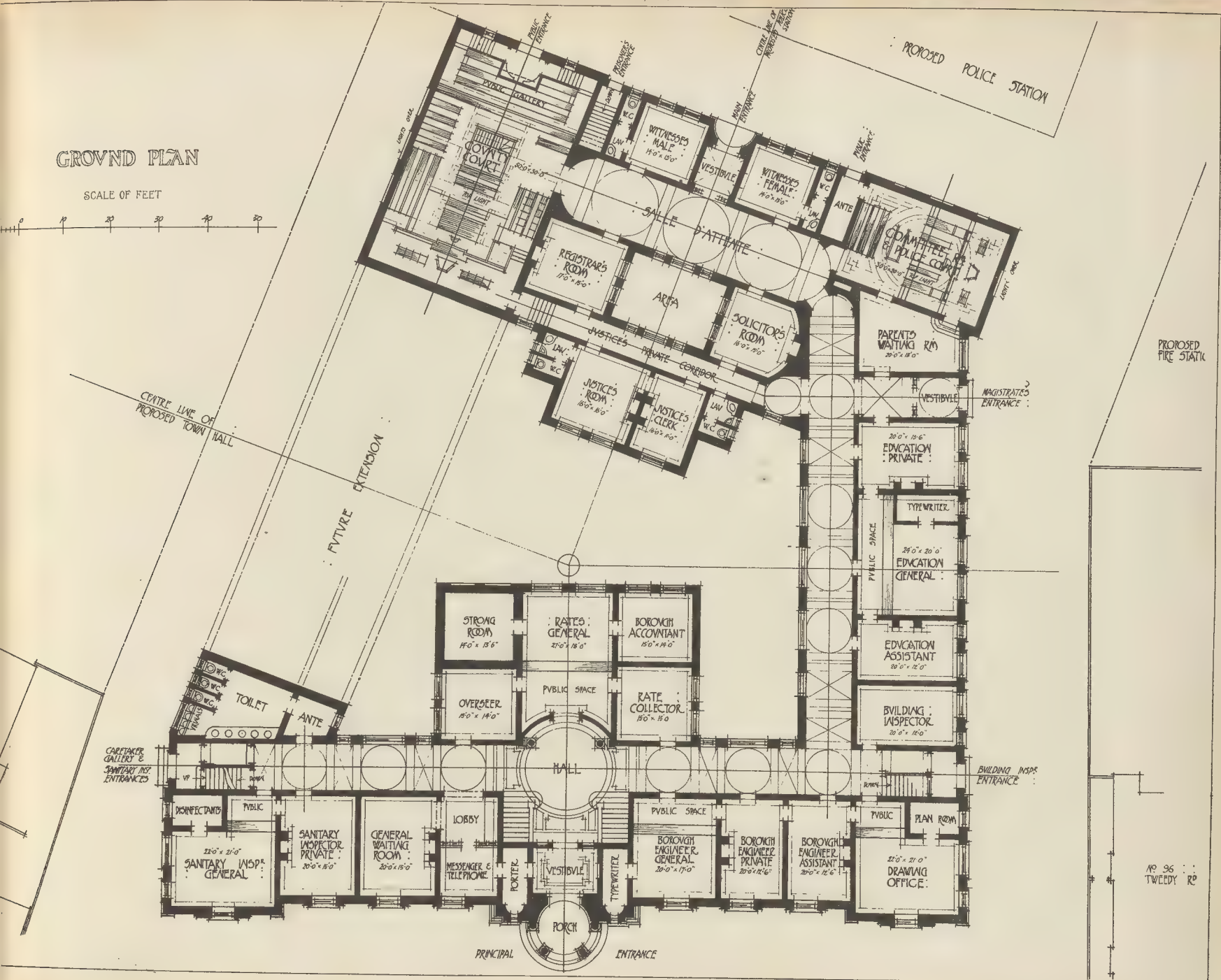
FRONT ELEVATION



FIRST FLOOR PLAN

GROUND PLAN

SCALE OF FEET



The Builder.

VOL. LXXXVIII.—No. 3233.

JANUARY 21, 1905.

ILLUSTRATIONS.

Church of the Sacré Cœur, Paris	The late M. Abadie, Architect.
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American Domestic Architecture.



THE history of American Domestic architecture, though brief in comparison with that of older countries, is of no little interest in respect of the illustration

it affords of the influence of social circumstances on architecture. It commences with the Colonial architecture, which is the architectural record of the connexion between America and the mother country; the Queen Anne and Georgian architecture little modified except by the influence of material, which led to much masonry architecture being translated into wooden architecture, sometimes far too literally, but in other instances with modifications, such as the increased tenuity of the columns, which really arose naturally out of the difference in the material employed, and originated a very pleasant form of house architecture with a stamp altogether its own, and not to be met with elsewhere. Then followed what American writers on architecture seem to recognise as the "transition period," which has no definite stamp at all except the kind of aimless effort to be picturesque in a new and often very clumsy manner. In recent days there has followed the generation of the millionaires and the play of large and sumptuous houses, attended by the desire to transport to the American continent something of

the splendour and magnificence of European Renaissance art. The millionaire, as a rule, it appears, wants art, though he does not know much about it, and he calls on the architect of the present day to furnish him with the right thing and the most sumptuous thing, regardless of cost. And the architect, for the most part, goes to France as the best place to acquire the learning necessary to supply the demands of the millionaire, and to satisfy him that he has got the right thing. But along with this development of the great mansion, there appears to have arisen also a renewed interest in the Colonial House, useless as a type for a mansion, it is true, but offering a type for the smaller house, especially for the seaside or country retreat, to which the American architect and client seem inclined to return, in a re-action from the aimless pretentiousness of the house of the transition period.

The interest which is taken in the subject is symbolised by the recent appearance of two books,* both of them sumptuously got up and crowded with illustrations; one under the title "American Renaissance," the other under that of "Stately Homes in America." The former deals especially with the subject of Colonial architecture and its quasi-revival; the other, as its title implies, is specially concerned, as far as the illustrations go, with the modern great houses of the States; but the literary

* *Stately Homes in America*, from Colonial times to the present day. By Henry W. Desmond and Herbert Croly. London: Gay & Bird. 1903.

American Renaissance: a review of domestic architecture. By Joy Wheeler Dow, architect. New York: W. T. Comstock. 1904.

portion of it, which is well and carefully written, constitutes a summary of the history of American domestic architecture from the Colonial period to the present day.

Both books have rather the air of having been written up as an accompaniment to collections of illustrations; in the "Stately Homes" however, this impression is given not so much by the writing itself, which is well worth attention, as by the illogical manner in which the illustrations are distributed at equal spaces throughout the book, every two or three pages apart, without the slightest reference to the text; so that a chapter on "The Colonial Residence" is accompanied only by illustrations of sumptuous interiors of modern houses, the illustration of which is evidently the *raison d'être* of the volume; though the literary portion taken alone is continuous and orderly throughout. In Mr. Dow's book the writing keeps more in touch with the illustrations; but unfortunately it is bad writing, flippant and vulgar and with a constant striving after what he regards as smart hits, nor shall we in fact pay further attention to it except to give one quotation for what it is worth, in regard to what he affirms to be the specialising tendency of the profession in America at the moment:

"I can think of no other profession which has quite so many branch specialists. Incredible as it may seem, there are prominent and successful architects—trained architects of ability—who are able to draw plans but who cannot draw elevations, and others who can draw elevations but cannot plan. There are architects who are skilful draughtsmen who cannot design, architects who can design but cannot draw at all, architects who can only write specifications and superintend

—two very important branches of the profession, however, that usually go together—while, stranger still, there are practical architects who can neither design nor draw nor write specifications nor even superintend, but who possess a wonderful business aptitude and personal magnetism by which they command clients for their partners or draughtsmen who actually prepare the drawings."

With us this last-mentioned type of architect, if still to be found, is only a relic of a past age, though the man who can design but cannot plan is certainly to be found. But this extent of specialising is not a characteristic of the profession in England; Mr. Dow seems to imply that it is so in America, which (if it be so) is probably because in America clients are in such a hurry for a building that a design can only be got out in time by a division of labour. Other witnesses, however, may deny the fact. We may say, however, for Mr. Dow, that he is apparently a better architect than author; he gives us in his illustrations some charming examples of Colonial architecture at its best; he has contrasted some of these most effectively with the pretentious attempts at the style in later days; and the few designs of his own which are given, revivals of the Colonial style, are entirely admirable.

The literary portion of the "Stately Homes" volume is a more philosophical production. The authors commence by considering the position of the modern millionaires, the "men who build fine houses." They are compared with the Italian rich men of the Renaissance, who were fighting for power at the risk of their lives, and wished their houses to be effective and conspicuous. The modern American millionaire has some similar characteristics. He is a self-made man, or the son of a self-made man. He is not risking his life, but he is occupied with schemes to increase his fortune. His house is built to be inhabited, with every possible modern convenience and comfort; but it is also built to be admired. But the American nature is conservative. The millionaire wishes to be effective, but to be effective in an entirely safe way; to avoid being crude or ridiculous, and here comes in the architect's chance.

The society of the Colonial period possessed no leisured class, and had not the wealth to spend that is now spent on an immense house. Their best houses were "spacious, rambling structures," fit to accommodate many guests, but not of palatial appearance. The architectural style approached very nearly to the model of the English home of the period, save that the carpenter instead of the mason gave expression to the old traditions. This is what gives its special interest to Colonial architecture; it is the only instance in architectural history in which the classic ideal was carried out in (for the most part) wooden construction: "the carpenter's interpretation of the Renaissance." Colonial architecture, however, was only a survival, and the survival of an aristocratic system, which could not withstand the impact of the new forces coming into play in American life and politics; its reign could be but temporary. Then came the architecture of the transitional period—of the American society so unkindly but probably not untruthfully depicted by Dickens, when the typical American residence is

said by an American critic (Mr. Montgomery Schuyler) to have been "the most vulgar habitation ever built by man," in which even the Colonial merit of good and honest workmanship was lost. And following on the re-action against this vulgarity of architecture came the reversion to historic types. The "brown stone" era, however, intervened, on which New York and other cities congratulated themselves at the time, bringing a heavy dull monotony to the streets of the principal towns. The period between 1865 and 1885 is described as being the beginning of the modern period; at first a period of confusion of tongues, the designs of the exteriors of country houses being "derived by a process of indiscriminate imitation from all parts of the world," while the city buildings were still dominated by the routine of the brown stone period. In the reform that followed it appears that our countryman Mr. Eastlake, through the influence of his "Hints on Household Taste," counted for a good deal; houses were even built in "the Eastlake style." Then the taste for European travel set in, and rich Americans began to collect old European furniture, fabrics, mantelpieces, etc.

"The next step soon followed. It naturally occurred to the importers of these beautiful and rare European antiquities that the best way to use them was to give them their proper value by grouping them in certain rooms; and consequently towards the end of the seventies this began to be done."

A special example is said to be the house of Mr. H. G. Marquand, in which were separate rooms fitted and furnished with the *bric-à-brac* of various nationalities, so as to make the house a kind of museum. This, however, is rather a matter of arrangement than of architecture. Alongside of this collector's mood sprang up a certain orderly development, "a desire to imitate the best architectural forms"; and the tendency towards adopting French culture arose from a feeling that what France represents in the modern world is "a sense of form and a devotion to form"; which is true enough.

"American residences, on the other hand, will not be understood unless it is frankly admitted that they are built for men whose chief title to distinction is that they are rich, and that they are designed by men whose architectural ideas are profoundly modified by the riches of their clients. This is an aspect of the matter on which it is not pleasant to dwell; but it is also an aspect, both of American residential architecture and of American life generally, which it is impossible and even dangerous to ignore."

This is frank, at all events, on the part of American authors. They go on to say on another page that the American millionaire house-builder really wants to have something admirable; his ideas are somewhat barbaric and lacking in "that sense of economy which is such a necessary corrective of artistic extravagancies and which lies so near to a love of beautiful things"; he wants to have his success in life demonstrated in architecture; but still he wishes to have it well done.

But he does not, like the Colonials, go to the English house for his model; and why? Because the chain of old association is broken. The Colonials were still, in their feelings, Englishmen, many of them of old family. The character and charm of English rural domestic architecture, say the authors (with perfect truth), "is due chiefly to the fact that there

have been for several hundred years resident on the English soil a class of well-to-do and well-educated country gentlemen" (we fear too much must not be said about the education) "whose interests and affections were centred around their country-seats"; and, on another page, they remark that it was perhaps an appreciation of the fact that the peculiar merits of English architecture were unattainable in a new country which has sent American architects chiefly to other countries for models. Certainly anything more unlike the ancestral English home, even in an architectural sense, than the American millionaire house, could hardly be imagined.

Let us now give a glance at some of the illustrations of the "Stately Homes"; in the words of the Lord of Burleigh—

"Let us see these handsome houses
Where the wealthy nobles dwell."

One of the most prominent is Mr. Geo. Vanderbilt's house, "Biltmore," of which Mr. R. M. Hunt was the architect. None of the interiors are given; we do not know what their attractions may be; but as an exterior and considering its importance and the amount probably spent on it, it seems to us a great failure. It is preceded by broad walks and grass fore-courts laid out on the most spacious scale and with classic symmetry, which lead up to a weak-looking house in an adopted French chateau style with an irregular and fussy skyline. An approach of this kind and on this scale demanded a house of the most broad and grandiose design as its culmination; as it is, the house is a complete anti-climax in respect of the approaches; nor is it a very interesting architectural design in itself, apart from the question of scale and surroundings. Mr. Hunt's house called "The Breakers," built at Newport for Mr. Cornelius Vanderbilt, is on the other hand a perfectly symmetrical Italian villa style of house, pleasing but not powerful, and certainly not answering to the associations of its name; it appears to have some fine interiors, notably the staircase hall. "Whitehall," built at Palm Beach for Mr. Flagler from the designs of Messrs. Carrère & Hastings, is a house with much more character externally than either of the above mentioned; it is classic in general lines, but classic with an originality of treatment (it is true that the illustration is too small to give any idea of the details of the interiors, the hall especially, are exceedingly fine and dignified; the manner in which the two opposite staircases rise behind the coupled columns is most effective. The residence of Mr. Widener, designed by Mr. Trumbauer, adopts the stately English XVIIIth century fashion of a great colonnaded portico with solid symmetrical wings, not an original conception, but it harmonises exactly with the dignified and symmetrical balustraded garden in front of it. This is the kind of house which should have met the eye at "Biltmore," instead of that restless chateau façade. The interiors seem to be treated in a large and stately manner worthy of the exterior. The Tiffany house, as shown in the interiors, seems to be a maze of curiosities; the fireplace in the studio is in every sense a monstrous thing, like a bad dream.

Then we come on exteriors which seem to recall the larger houses of the Gothic revival in this country; Brokaw House (New York), designed by Messrs. Rose & Stone, a specimen of domestic Gothic of a character mingled of French and English; and Mr. Bruce Price's "The Turrets" at Bar Harbour, a house full of round turrets and bays and heavy projecting eaves, and entirely built in roughly rusticated stone. This, of course, is a special characteristic treatment for a sea-side house, and as such successful. Messrs. McKim Mead & White's house at Mamaroneck is a kind of mixture of an English country house and a French mediæval château, picturesque enough though rather too designedly so.

Generally speaking, the exteriors of these houses seem to represent either a rather cold and correct classicism, without much effect, or a rather weak effect of irregular design which looks as if consciously intended to be picturesque. There are few exteriors illustrated in the book which are really successful, not one that is remarkable. The interiors illustrated display a great deal of rich effect, sometimes in excellent taste, but too often with that extravagant overloading of ornament which too plainly proclaims the taste of the millionaire.

No plans are given; a fact which confirms our view that the book, though the authors are (we believe) architects, was produced mainly as an ornamental publication. It is something to say of a book produced on that footing that it is nevertheless worth reading, and the illustrations give a pretty good all-round idea of the tendencies of modern American domestic architecture of the more costly kind. On the whole one comes to the conclusion that the millionaire residences are not for the most part very striking or satisfying in external architecture; and that in the internal treatment there is rather a tendency (with some happy exceptions) for richness of ornament to be exaggerated into display.

DRAINS AND SEWERS.

WE have frequently had occasion in these columns to comment on the complexity of the law relating to drains and sewers, and we have deplored the fact that matters affecting the every-day relations both of landlords and tenants and the local authorities should have been involved by the legislature in such obscurity that no layman could hope to regulate his conduct legally aright without professional advice, whilst, even if that were obtained, litigation often could not be avoided owing to the conflicting decisions given in the courts in their construction of the involved sections of the numerous enactments. We venture to think that the volume now before us* affords in itself a complete justification for those criticisms on the existing law, since this treatise, which is a digest of the law relating to drains and sewers done, contains 650 pages of text and comprises a reference to, roughly

speaking, some 1,500 decided cases. Since the promised amendment and consolidation of the Public Health Acts seem relegated to the distant future, we are pleased to find this special branch of the subject commented upon and explained by such an authority as Mr. MacMorran, and, although the learned authors of this text-book themselves deprecate the idea that the subject can be made simple in any treatise, we feel sure that this digest of the law will be welcomed, not only by legal practitioners, but also by surveyors and the general public.

The work is divided into three parts. The first part deals with sewers and drains in districts outside the Metropolis. The second part is devoted to the Metropolitan area, whilst Part III. deals with general questions, such as nuisances, the liabilities of authorities, the ratifiability of sewers, and the pollution of rivers, and the sections of the various Acts of Parliament referred to in the text are set out in an appendix. Last, but not least, a comprehensive index is included in the work, covering 129 pages. The various propositions of law are set out in short paragraphs, and are supported by the decided cases, which are referred to in the text and not in foot-notes, an arrangement we should wish to see followed in other text-books, since it conduces to the clearness of the subject for the general reader. The authors have contented themselves with endeavouring to reconcile the very conflicting decisions that have from time to time been given on the various sections of the Acts of Parliament by courts of concurrent jurisdiction, and, possibly wisely, have refrained from a criticism either of the legislation or of the decisions themselves, but having laid down certain general propositions in accordance with the majority of the decisions, they merely direct the reader's attention to the adverse decisions by some such expression as "see however" at the foot of the proposition as stated. The non-professional reader must, however, be on his guard to give due weight to these references so introduced. As an example, we may cite the first proposition stated on p. 43 under the side-note, "Do unlawful connexions convert drains into sewers?" a subject we have frequently drawn attention to in these pages. The first proposition is stated thus, "When the contest lies between the authority and a private individual as to whether or not a given pipe is a drain or a sewer, it is not generally material to consider how a second house may have had its drainage connected with an existing drain, for so long as the connexion lasts the pipe which is common to the two houses is a sewer, whether the connexion was made wrongfully or surreptitiously or without the knowledge of the authority (but see the remarks of Channell, J., quoted p. 46)." A reference to p. 46 shows that an owner cannot benefit himself by his own wrongful act, but that the surreptitious connexion must have been made independently of him either by a predecessor or by some third party; and we think it would have been safer to state this important

exception or reservation in the proposition itself. On the question of what constitutes a "single private drain" under section 19 of the Public Health Acts Amendment Act, 1890, a subject we discussed in our issue for November 26 last, the authors sift the conflicting decisions very ably and concisely, and state the law as it has since been decided by the Court of Appeal. The case of *Thompson v. Eccles Corporation*, which placed the narrow construction upon this section that it only included private drains constructed for the purpose of making a profit, is commented upon in the text as conflicting with other decisions and being irreconcilable with them, but this difficulty has disappeared since, as we pointed out in our recent paper on the point, the Court of Appeal have reversed this decision only within the last week or two. Although we have mentioned the bulk of this volume, we have only done so as illustrating the complexity of the subject and the difficulties inherent to the questions commented upon; the text is peculiarly concise; we do not think any compression could have been effected without a sacrifice of clearness, and the book as it stands appears to supply a long-felt want.

NOTES.

RECENT gales and high tides have left their mark upon coast protection works in many parts of the country. At Yarmouth the new beach gardens were swept bare, large blocks of concrete on the works in progress were displaced and tossed about by the surf, and a breach was made in the river walls. In the adjacent town of Lowestoft, the esplanade wall was washed away for a length of 50 ft. At Cleethorpes parts of the new sea wall of concrete were broken down, and large quantities of backing were carried away. The Humber banks were broken through at Swinefleet. At Scarborough the new sea wall, formed around the foot of Castle-hill, was cracked in three places by the force of the waves and hundreds of tons of filling were washed away, and the new sea wall between Hartlepool and Seaton Carew suffered very considerably, several portions varying in length between 30 yds and 100 yds. being completely wrecked. These instances demonstrate in a striking manner how puny are the efforts of man when opposed by the great forces of nature, and point the lesson that beach material is a far more satisfactory defence than costly engineering works which, taking years to construct, may be ruined in a day. This lesson has still to be learned by the Government and landowners generally.

The Testing of Portland Cement.

NO BETTER proof could be found, if one were wanted, of the great interest taken by architects, engineers, and chemists alike in the improvement of Portland cement than the voluminous literature on the testing of this invaluable material. And the world-wide interest of the subject is proved by the numerous references contained in our columns from

* "The Law Relating to Drains and Sewers." By Alexander MacMorran, M.A., B.C., a Bench of the Middle Temple, and W. Addington Willis, LL.B., of the Inner Temple. Barristers-at-Law. (London: Butterworth & Co.; Shaw & Sons, 1904.)

time to time. We have now received in pamphlet form the reprint of a paper read by Mr. James Nangle before the New South Wales Institute of Architects, which is useful as containing a description of a few reliable tests that can be made with ease and with reasonable speed in any architect's office. These tests can be performed without the elaborate apparatus to be found in the laboratory of a cement-testing expert, but they are sufficient to permit the formation of a safe opinion as to the quality of any sample of cement. The three tests recommended are for soundness, fineness of grinding, and tensile strength. The first method proposed by the author is that of Dr. Michaelis, which can be used with little expenditure of time and trouble; the second merely involves the use of a sieve with a sufficient number of meshes; and the third of a simple tensile testing-machine, in which the load is applied gradually by the use of shot. As a clear summary of these tests, and of various points to be observed in connexion with them, this paper is quite worthy of perusal by the uninitiated.

Structural Timber Tests.

A most important work resumed by the United States Bureau of Forestry after an interval of some years is the testing of timber for structural purposes. The present series of tests is being undertaken by Professor Hatt, of Purdue University, and an interim report has been published lately. Every architect and builder fully recognises the uncertainty which must always exist as to the precise strength of timber owing to variations of structure and condition. This is a factor which can never be eliminated, and it always happens that defects or sources of weakness are far more evident in baulks and planks than in small specimens such as are usually selected for testing. Again, the proportion of moisture in a piece of timber depends very much upon its dimensions while undergoing the process of seasoning. Consequently, to be safe it is necessary to base calculations of ultimate strength upon data relating to unseasoned material. The summary of Professor Hatt's work now available shows that all essentials are being properly recognised, and in particular that comparative tests are being made on timber, of which the cross section measures 2 in. by 2 in. in the case of small, and from 6 in. by 8 in. to 8 in. by 16 in. of large specimens. It appears that the results given by the former are fully 30 per cent. higher than those for the latter, and it is also shown that when the proportion of moisture exceeds 25 per cent. ultimate strength diminishes rapidly with every increase of the proportion. These are very important results, and indicate that the complete report will be a most valuable document.

"The Science of Ventilation."

VENTILATION has for so long a time languished under the whims and fancies of the vain and noisy empiricist, that one wonders to find a man bold enough to describe it as a science. Yet this is what Mr. J. D. Sutcliffe did on Tuesday last, when, at the annual general meeting of the Institution of Heating and Ventilating Engineers,

he read a paper entitled "The Science of Ventilation." It is a sane and useful contribution to the literature of the subject. The author brings no axes to grind, and is at pains to point out the relative advantages and disadvantages of the "natural" and "mechanical" systems. Unlike some anonymous but well-known partisans, he does not condemn one system *in toto* and claim every merit for the other. On the contrary, he considers that "natural" (or, as he prefers to call it, "automatic") ventilation is the more suitable for ordinary houses, churches, and generally for schools and other buildings of one story; for schools of two or more stories, and also for theatres and factories, he recommends mechanical ventilation. Somewhat curiously, among the many kinds of building described by Mr. Sutcliffe, hospitals are not included. The relative cost of natural and mechanical ventilation varies so much according to circumstances that no hard-and-fast ratio can be calculated, but certainly some notes on the matter would have been useful. Incidentally the author gives valuable hints on warming apparatus. He is an ardent advocate of the open window, and strongly condemns the lukewarmness of the Board of Education in the matter of school-ventilation. The paper is now issued in the form of a pamphlet of forty-one pages with twenty-seven illustrations.

Subways for Goods Traffic.

Two or three years ago the proposal was made by a civil engineer in this country that goods as well as passenger traffic should be dealt with by a complete system of underground lines linking up the present tubular railways with the great terminal stations of the steam railways. This scheme, as our readers know, came to nothing, but in the new Chicago subway we have the realisation of a great undertaking which deserves imitation in London and all other great cities. The portion of the subway now on the point of being opened with a collective length of 22½ miles will be used entirely for merchandise, and when fully equipped will be provided with several thousand cars and 150 electric locomotives. The main lines being near the surface afford facilities for the numerous stations and sidings mentioned by Sir William White in his recent lecture, and there is no doubt that the system constitutes one of the most valuable expedients for the relief of crowded thoroughfares from slowly-moving traffic, which is an intolerable nuisance to other users of the streets. It also promises to do away to a large extent with the objectionable conditions attending the loading and unloading of vans across the foot pavement.

Tramway Overhead Equipment.

THE paper on "Tramway Overhead Equipment Materials," which was read last week to the Tramways and Light Railways Association by Mr. H. M. Sayers, will be much appreciated by traction engineers. Although the overhead work required for electric tramways is apparently very simple, the problems which have to be solved are really very complex: The most economical size of

trolley wire to use, for instance, cannot be found by any pocket-book formula. Practically every tramway company uses a trolley wire which is 0.324 in. in diameter, but, so far as we are aware, no satisfactory explanation has been given why this size should be chosen. The life of the wire varies with the gradients, etc., on the line, and the average life is about a million passages of the trolley wheel. Mr. Sayers pointed out that the hardness of the copper wire diminished from the circumference to the centre, and that the thickness of the skin of "hard" copper depended on the method of annealing employed. The trolley wire has to withstand considerable mechanical stresses in practice. The upward thrust of the trolley pole and the friction of the wheel produce vertical and longitudinal stresses which severely tax the strength of the supports. The lecturer did not mention the "bow trolley," but when this type of trolley is used the stresses are considerably reduced. In practice, also, tramway systems which use this kind of contact-maker, are never troubled by the trolley wire breaking. Mr. Sayers recognises the danger of supporting the trolley wire by short bracket arms, and from the engineering point of view he is right in regarding the span wire system of support as the best. Guard wiring is considered to be a necessary evil, as, in some instances, the owners of overhead wires cannot be prevented from erecting new wires over existing trolley lines. Apparently, tramway companies on the Continent have the same difficulty in guarding their overhead work from falling telephone or telegraph wires, and numerous petitions have been presented to various Governments asking them to introduce legislation to limit the powers of those possessing overhead way leaves.

THE following letter, signed by the President of the Strand Improvements Royal Academy and a number of members of the Academy, as well as outside architects, appeared in Tuesday's *Times*.—

"We, the undersigned, are anxious that the improvement of the Strand should be carried out in a manner worthy of so great an opportunity.

We desire to express our opinion that the frontage-line now proposed by the London County Council will have a bad perspective effect, and we trust it may not be too late for the Council to adopt some plan showing better consideration for the position of the churches of St. Mary-le-Strand and St. Clement Danes.

We also desire to protest against the height of the buildings already begun, and to express our hope that on the rest of the frontage the new buildings may not be so lofty as to overpower the two churches and Somerset House, which are and should remain the principal ornaments of the Strand."

The letter is to be presented, as a memorial, to the London County Council. This appears, as far as the second clause is concerned, to be the revival of Mr. Hamo Thornycroft's original proposal. Much as we should have liked to see that adopted, our impression from the first was that Mr. Thornycroft had weakened his position by asking too much. But there might well be a middle course adopted between that and the line at present proposed by the County Council, which will certainly have a very bad effect in looking eastward from St. Mary's church to St. Clement Danes. With the protest against over-high buildings and

consequent interference with the scale of the important existing buildings in the Strand, we of course entirely agree.

There is a kind of field-day of Impressionism at the Grafton Gallery, where there is a collective exhibition of the works of several of the leading French painters of this school. Boudin, whose name comes first in the catalogue, should however be considered separately, his works representing more sober and rational aims in painting; but a consideration of those, to the number of thirty-eight, exhibited here, only intensifies the surprise which we expressed last week that a critic so generally competent as Mr. Wedmore should have thought of grouping him with Fantin-Latour. The best of his works here seen is the admirably composed small landscape called "Pine-trees at Juan-les-Pins" (10); but neither this nor any of the others are things to be enthusiastic about; they are good average painting, not more. The remainder of the exhibition may be considered to be the apotheosis of pigment. For that is the characteristic (among others) of all these works by Manet, Monet, Urdine, Mme. Morisot, Degas, Sisley, etc., that you never get away from the impression of paint—paint laid on thick—crude, materialistic. That painting is the transmutation of nature through the medium of pigment is true enough; but one would like to see a little more of nature and a little less of the paint. There is no pure pleasure to be got from this kind of art. In Sisley's pictures, for instance, there is composition and what XVIIIth century critics would have called certain *brio* in the treatment of foliage; but wherever water is introduced in his pictures (and it generally is), the charm is gone; it is not water, it is mud, or opaque paint. In M. Monet's works there is every now and then a certain inspiration, as in his "Snow Effect" (119), "Tulip Fields at Sassenheim" (130); but generally there is no nature in these things; it is all paint; his pretended picture of "Rouen Cathedral" (120) is not even that—it is worsted work; and his entire indifference to shadow has the effect of depriving his pictures of light. M. Renoir has inspirations in colour at times, as in "Teatime" (238), in the "Portrait" (221) of a girl in a red hat, in the sketch called "Young Girls at the Seaside" (252); but his figures are mostly commonplace; they all have the same face; and his two life-size paintings of figures waltzing—"Dancing in the Town" (242) and "Dancing in the Country" (243) represent what one would call the lowest depth of vulgarity, if one did not find over deep in such a thing as "A Lunch after Rowing" (244), or in the daubs of half-dressed women by the late Mme. Morisot. Let anyone go to the exhibition of Watts's pictures at Burlington House, keep his mind in Watts's noble style and associations, and then go to the Grafton gallery and ask himself—what would Watts have thought of this kind of art? Happily, this is not representative French art; it is only its uncomely arts; to see much of it got together in the gallery ought to be a lesson to the

kind of critics who rave about it—if they were not past lessoning.

STEPS are now taken for completing the restoration of No. 17, Fleet-street, the fee-simple of which the London County Council acquired for 20,000*l.* five years ago from, we were informed at the time, Clare College, Cambridge. The house is often called the "Palace of Henry VIII. and Cardinal Wolsey," but a recent search in the Inner Temple muniments quite dissipates that story. The records show that at a "parliament" held on June 10, 1610, the Benchers agreed to close their gate in Fleet-street during the rebuilding by John Bennett, their serjeant-at-arms, of the gate and of the house that stood over the gateway and Inner Temple-lane, and of the adjoining house (east) the Prince's Arms*. In consideration of a lease granted to him, Bennett covenants to raise the gate and its walls to 11 ft. high and 9 ft. broad. The record gives details of the undertaking, and sets forth that the new building is to be 19 ft. in depth from the street, with a "jettie" or overhanging of its front to project 2 ft. 4 in. over the pavement. On the first floor of the Prince's Arms, afterwards the Fountain Tavern, was the Council Chamber of Henry, Prince of Wales and Duke of Cornwall, whose cognisances, together with the decorated panels, were re-fixed in the façade built 20 in. in front of the original elevation; the two gables and the carved oak pilasters and balustrades of the upper floors, which had two bays with transomed windows (the mortices remain), being thereby concealed—*confer* Schwebel's drawing of 1806, and one, the oldest known, in the Soane Museum. In his "Vanishing London," 1894, are Mr. R. W. Paul's measured drawings of the fireplace and ceiling, with the carved panelling on the west wall, of the first-floor room, 20 ft. by 23 ft., and 10 ft. 6 in. high. Of the enriched plaster ceiling, one of the finest after its kind in London, the ribs, panels, and spaces are ornamented with conventional foliage, in the centre are the Prince of Wales's plumes and motto between the letters "P" and "H"; the ornamental work around the room belongs to different periods, and on the north, south, and east sides evinces subsequent alteration and additions. Three years ago it was resolved that those features of the interior should be repaired under Sir Purdon Clarke's supervision at South Kensington, and that the former front should be opened out and be supported on cantilevers from the shop-front, as set back to widen the street. In January, 1795, "Mrs. Salmon's Wax-work" was removed by Mrs. Clarke to No. 17, then Nando's coffee-house, from No. 189, opposite, since the site of Præd's Bank. No. 17 has been tenanted some seventy years past by Thomas Skelton and his successors, hairdressers, etc. The estimated cost of re-building the rear portion amounted to 7,000*l.*; the City Corporation agreed to contribute 2,500*l.* in respect of the widening of Fleet-street on the south side.

* In 1554 Robert Holbech had sold the two premises to Richard Tottell—see Feet of Fines, Middlesex; Easter, 2 and 3 Philip and Mary.

The President of the Institute THE smoking "At Homes" which were initiated by Sir Aston Webb, are being continued by his successor, and on Monday last Mr. Belcher received a number of members at 9, Conduit-street. On each of these occasions there has been some kind of exhibition of artistic work, and on this occasion Mr. Belcher had the happy idea of getting together an exhibition of sculptors' models, chiefly of sculpture intended to be connected with architecture as a decoration. The result was a most interesting show of first ideas for sculptural decoration, together with a few more finished models of special work. Among the principal contributors were Mr. Bertram Mackennal, Mr. Frampton, Mr. Pomeroy, Mr. Goscombe John, and Mr. Alfred Drury.

MR. CLAUSEN'S LECTURES ON PAINTING.

MR. CLAUSEN's second lecture to the Royal Academy students, on Thursday the 12th, was on "Imagination and the Ideal." Imagination, he said, was the driving force of the artist, whether in the case of a painter from actual life, like Velasquez, or of a painter of ideals, like Blake. Imagination was necessary even for a portrait painter; it suggested the point of view from which he treated his subject. Indeed, it might be said that imagination alone, even with limited technical skill, made the artist. Blake's work impressed us on account of the imagination displayed in it, in spite of his frequent feebleness of execution; though it might be said that Blake's really strongest point lay in his simplicity; his sublimity was apt to be a little theatrical. Blake was to a great extent influenced by Michelangelo, but without really knowing his works. He knew them only by drawings, in which Michelangelo's characteristics were exaggerated; he had not, as we had, the assistance of photography to show these works as they really are, and he had of course never seen the paintings themselves. Blake attached so much importance to imagination that he said that unless a man imagined something higher and grander than had ever been seen by mortal eye, he could not be a great artist. What a contrast was this to Reynolds's position (referred to in the previous lecture) that we could not imagine any beauty except what was founded on or suggested by Nature, and that even in our conceptions of Heaven we could only draw on terrestrial imagery. Mr. Clausen quoted Blake's celebrated saying about the sunrise, that he did not see a golden disk about the size of a guinea [Blake's idea of estimating angular space on the sky was evidently very rudimentary], but a multitude of angels saying "Holy! Holy! Holy!" and if Blake had been moved to paint a picture of sunrise, it was very likely that he would have represented it, in some kind of symbolical manner, by figures of angels. But Turner had the same great imaginative view of Nature; though he did not personify as Blake would have done, he was conscious of the great element in Nature. Blake could do it by imaginary personification only; Turner could give us the imaginative element in the representation of Nature herself, because he had that power over his materials which Blake wanted. This quality of imagination could be recognised in the greatest painters even of the Dutch school, which was generally regarded as entirely realistic. Compare, for instance, Jan Steen, Metz, or de Hooghe, on one side, with Mieris on the other. The three former, however realistically they painted detail, recognised and made one feel the dramatic element in a situation. In the paintings of Mieris there was no dramatic element; very carefully painted detail, but nothing more; his detail might be all right, but he had no imagination. Michelangelo represented the most perfect union ever known of imagination with technical power; his workmanship was surpassed only by that of the Greeks, but it was not perfected for the sake of showing his technical knowledge, but to serve the end of more fully expressing his imagination. Michelangelo's figures, it might be observed, were

rarely at rest; they represented a moment of action. The remarkable thing about them was that while they were very individual in character, they nevertheless represented great types of humanity. This was illustrated by photographs of some of the figures from the Sistine chapel—the Jeremiah, the Isaiah, one of the Sibyls, etc.—each of which was a grand human type, but each with a marked individuality. The same characteristic could be recognised even in the decorative supporting figures; they were distinctly alive and characteristic. As Reynolds had observed, there were two ways of imitating Nature, with the mind or only with the eye. With Michelangelo the former prevailed so much that it might be said that he could hardly detach himself from his own feelings sufficiently to face Nature frankly. Raphael was somewhat different in this respect. He seemed to have had a wider observation of the life around him, and drew more directly from it in his paintings. He was especially successful in his manner of grouping figures in connexion with an incident or action, so that with Raphael we were attracted by the group, with Michelangelo our attention was drawn rather towards the power and expression in single figures. Raphael seemed to have been at his best in painting individuals from life, not abstract figures; his ideal did not control him altogether; hence the power and interest of his portraits. This was curiously illustrated in some of Raphael's grouped pictures in which figures which were obviously portraits were combined with figures representing ideal personages. The former were always the stronger and the more interesting. Raphael's ideal figures had not the same convincing character as Michelangelo's, they tended to fall into a kind of school conventionality. Photographs of two or three of Raphael's pictures with many figures, partly real partly ideal, were thrown on the screen in illustration of this. In the "Heliodorus," for instance, the group of the man overthrown by the horse was so true and lifelike that it had become almost a model for that sort of incident in painting, whereas the kneeling woman on the left with her hands raised in terror, was a conventional figure hardly in harmony with the rest. [While we quite agree with the main position (which was more fully illustrated in another picture by Raphael the title of which has escaped us), it might be added that the heads of the two avenging angels who follow the horseman, though ideal, are full of energy and vigour.] The worst in connexion with Raphael's more conventional figures was that the convention was imitated by his weaker successors, and had thus an influence in bringing about the decline of the great Renaissance school of Italian painting. But Raphael had the faculty of giving the most characteristic expression and grouping in illustrating an incident; his method became almost a fixed standard. This seemed now to be taken for granted; but if we thought out the situation, imagined Raphael facing a blank wall with this kind of composition to be worked out on it, we began to realise his true greatness, and that his works were among the eternal things of art. But his work was in some sense a continuation of things already done. He must have noted many effective groupings in the actual scenes of the life around him. Then he had to paint for large spaces, which required large and simple lighting, so as to be seen from a distance. Modern life was too complicated and rapid to furnish such opportunities. For this kind of picture we could hardly refer to Nature, only to old paintings.

Rembrandt also painted ideal subjects founded on the life around him, but in a very different way. He could not conceive that people in the Scripture narrative were materially different from the Dutch men and women about him. But he was a painter of great imagination, and in spite of his apparently realistic way of using figures, his imagination kept him above mere realism. He painted Dutchmen, Raphael painted Italians. Both had imagination, but the results were as different as the models on which they drew. Raphael's version of a historical event impressed us with the feeling that if it did not really happen in that way, it ought to have done so; but we could not accept Rembrandt's version in that spirit. We could not take his Dutch figures as the representation of Biblical scenes and figures. But he presented them with such life-like truth and such vivid effect that he overpowered the ancient conventions. His imagination was narrower and more restricted than that of

Raphael, but it went deeper. He might be said to have fixed the Dutch type in painting, as Raphael appeared to have fixed the Italian type; but the results were very different. It was curious to contrast the fate of the two painters, and their ultimate effect on the art of their respective countries; Raphael dying full of honours and with the acclaim of the world, and yet his school dying out, so that modern Italian art has no reference whatever to it; Rembrandt dying in poverty and obscurity, yet having created a type of art which asserted itself more and more, and which was to this day the most powerful influence in connexion with the art of his country.

Perhaps one reason for this was that the kindred spirits with Raphael were few. He appealed to a very high ideal, and not everyone could attain to sympathy with it. Among the few was certainly the great artist whose works were at that moment collected in the adjoining galleries. Mr. Watts was remarkable for his great range in painting, and for his full command of his materials. Rousseau said to Millet "We are struck by a real power from its very beginning. You were always the little oak that was intended to become the great oak." So it was with Watts. His own portrait of himself painted at the age of seventeen was as remarkable as many of his later portraits. His first exhibited work, the "Wounded Heron," showed already a power of handling his materials and of representing what he saw which might be compared with that shown in the typical works of the Dutch school. His variety of handling was very great. In his portrait painting the character of the sitter, or his idea of it, seemed almost to dictate the style of handling the brush, the touch in the painting. He had an especially fine sense of the quality and gradation. His use of transparent colour on light colour was very remarkable; even in the case of deep shadows the underlying light colour seem to lighten up the picture. In ideal figures, such as the "Daphne" and the "Ariadne," he evidently felt that it was not enough to pose a model and call it by a special name; he endeavoured to realise the ideal of the character represented; his works of this class did not, as was too often the case, suggest a model. In the third stage of his art Watts had especially devoted himself to the expression of his imagination, to the effort to suggest in the language of art, modern thought on things ethical and spiritual. It had been questioned whether in this attempt he had not sacrificed some of those qualities which art should have. It might be so; it was a question he felt hardly able to discuss at the moment; but we must take his life and his art as it was. "Hope" and "Love and Death" were pictures which had actually become a part of modern thought. [In this we cordially agree; but we should class them as belonging not to Watts's third, but to his second and greatest period, before he had fallen into the snare of neglecting beauty for the sake of meaning.]

It had been said that Watts, in respect of colour, was only an imitator of the Venetians. He (the lecturer) would not say that; he would say that Watts had learned from the Venetians that the feeling of a picture depends on its tone of colour more than on any other quality. It was only possible to succeed in this when one had studied fully the whole range of colour. His landscapes, which were very fine, showed how he had grasped the general aspects of Nature; and the alternations of light and dark colour in his figure paintings produced on one somewhat the effect of landscape. In all his work Watts was true to his own ideals, and had always kept himself apart from any special school.

The third lecture, delivered on Monday last, dealt with the subject of "Invention." Reynolds had observed that the painter was not so much concerned in actually inventing a subject, as in imagining it in the manner most suitable to its treatment in painting. This led to what was called "Composition," which was concerned with the arrangement of the scheme of light and shadow, the background and the treatment and position of the figures. Composition was in fact the greatest difficulty in the production of a picture. Anyone, with separately, the individual parts of a picture; to combine them into a satisfactory whole was the work of genius. If we looked at a work which was satisfactory and striking as a whole—such, for instance, as the St. Helena of Veronese

in the National Gallery, we might see no difficulty in copying and reproducing various portions of such a picture, but to recognise and understand what it was which constituted its effect as a whole was quite another matter. We had to understand the principle of its invention.

This was a view of art which specially appealed to artists rather than to the public. An artist did not want merely the expression of a scene or a character; he wanted to have this conveyed in an artistic and well-balanced manner; whereas many spectators were not artists would be equally satisfied with a bad composition if only the expression, the incident or of character struck them correct. The expression and action of a figure was very important. Leonardo da Vinci said that one should go about with a note-book observing the different actions of people in their natural and ordinary manner of life, sketching them on the spot, and preserving them for reference. Painters, he said, must observe and sketch the action at the time it was unconsciously made and was prompted by some cause; expression assumed without a cause was never worth anything. A painter, he added, should propose to himself a discussion or system in regard to any remarkable objects or circumstances that came under his notice, such as the effect of shadows, etc. Most great painters, in fact, had done this. Most of them made many studies for the figures intended to be introduced into their pictures. Raphael would try a single figure in various attitudes. Such studies were very valuable as suggestions in the method of working out a picture; and when we found that these great painters had been obliged thus to experiment with their figures before being satisfied with the result, we felt that they were somehow brought a little nearer to ourselves.

Several sketches by Tintoretto, Bassano, and one or two others, of the same subject—the Adoration of the Infant Christ, were thrown on the screen as examples of sketches of composition. That by Bassano showed what might be called a circular composition, the Infant Christ being in the centre, the other figures bowing towards Him in natural attitudes, but so as all to lead up to and emphasise the central figure.

Invention was a simpler matter in landscape than in figure subjects. For the subject was there before you; it was a question of selection rather than invention. They should consider what was the main element in the effect of the scene; generally a fine effect of light, or of shadow. A sketch of Rembrandt's was shown on the screen, in which, with very little incident, a picture had been made out of a remarkable passing effect of shadow. The principal thing on which the effect of a picture depended was a knowledge of the effect of light and shadow as influencing colour. The perception of this was only attained to in the history of painting by slow degrees, until Titian obtained the complete command of it, and blended figure and landscape into one whole.

Almost every great figure painter, indeed, had been more or less a landscape painter. It was no use to spend life entirely in a studio. A painter must look at his subject as a whole, systematising his observation. Claude's "Embarkation of the Queen of Sheba," shown on the screen, was an example of the manner in which leading lines of composition governed the whole. There was no rule to be given for designing the composition of figures. Different principles had been suggested—composition in a pyramidal form, in a circle, etc.; but these were of little use. If the painter saw the subject in his mind as a whole, it would come out right. There was no rule, for instance, to be got out of Watts's pictures. Raphael was the greatest of all painters in grouping and invention. His figures were always related to each other in their position and action, and their action was always natural and therefore beautiful. The cartoon of "Christ's Charge to Peter" (shown on the screen) was a fine example of this. If we studied the composition, beginning on the right at the outside figures of the group of apostles, we saw that the three or four figures further from the centre of action were closely combined, with no very special expression of interest; as we approached nearer to the two principal figures the group began to open up, and the separate figures to express their interest by individual action; while the two principal figures, those of Christ and Peter, were emphasised by being kept entirely separate from the group. If we compared this with Massaccio's design of Peter ordered to take the money

("Take up the fish that first cometh up"), we saw that in respect of composition this was far inferior to Raphael's picture; the grouping of the figures seemed to be casual and not such as to emphasise the main incident. This group of Raphael's, with its figures more and more interested as they were nearer the central incident, was so true to nature that it had become almost typical. A design was shown of Giulio Campi's, considerably later than Raphael, in which he had obviously been influenced by this composition, while at the same time making an obvious effort to be original—not to repeat Raphael's composition too exactly. This typical character was found in all Raphael's important pictures. If we took his illustration of the City on Fire, every variety of temperament was indicated in the expressions and attitudes of these numerous figures all under the influence of the same terror, so that it seemed that he had done all that could be done in the illustration of such a subject, there was nothing left for his successors but to follow him.

It was an interesting question whether Reynolds was right in his view as to generalisation. He thought that we should generalise nature in the first instance, and only descend from the generalisation to particulars. But the history of art was a warning against the effort to deliberately adopt a "grand style." Constable seemed to be right in saying that in painting a scene he endeavoured, in treating it, to "forget that he had ever seen a picture." The study of old painters, however, might have the effect of steadying our judgment, and preventing us from being led aside after what might be called "fads." There was too much idea at present of cultivating execution—"virtuosity," for its own sake. This was a mistake. If "art for art's sake" meant that art was only to show off achievements in technique, it was putting the cart before the horse. Painting was a means and not an end. Gêdô ne had made the observation that painting carried out only to show off method and execution was like a man making a speech only for the sake of talking. Students' work being largely imitative, in order to acquire power over their materials, there was the danger of the work being supposed to be the end in itself. The great painters of the French school fifty years ago, as well as Watts more recently, were occupied with the expression of their work, not with the mere execution. The opposite method was shown in some of the work of Sandys, exhibited at present in one of the galleries. There was, among other things, a portrait of an old lady, containing a multiplicity of detail in the representation of the dress, etc., but it was all detail, and not a harmonious whole; every item was there, but not a picture. This might be compared with the representations of detail in Watts' portraits, where there was no absolute imitation of detail, everything was subordinated to the effect of the whole. A great truth of impression could not be produced merely by adding together all the little truths. Quoting Rousseau once more, that great landscape-painter had said that composition consisted essentially in that which is within us entering as much as possible into the reality of things: composition was the soul of the artist.

The fourth and concluding lecture was delivered on Thursday afternoon, but we cannot of course report it in this issue.

THE BRITISH SCHOOL AT ROME.

THE first open meeting of the season of the British School at Rome was held on Monday, January 9, in the library of the School.

The Director (Mr. H. Stuart Jones) read a paper upon the bas-reliefs in the Villa Borghese attributed to the Arch of Claudius. He showed that the ordinary theory rested upon a mere conjecture made by Nibby, the Italian archaeologist, in the early part of last century, which had been up till now unquestionably accepted as a statement of fact, and that the style of the reliefs was in direct contradiction with it. Their provenance was, in reality, quite different from that which has hitherto been assumed. At the end of the XVIIIth century they were in the Church of S. Martina, not far from the Forum of Trajan, and were bought by one Giam-battista della Porta, whose heirs sold them, with the rest of the collection which he inherited, to Cardinal Scipione Borghese, who was then busied with the adornment of his newly-built villa, in or after 1618. Their style, as Winckelmann did not fail to recognise, is that of the

time of Trajan, and they probably belonged to some building of his Forum.

Mr. A. J. B. Wace, Fellow of Pembroke College, Cambridge, and student of the School, followed with a paper on Hellenistic royal portraits, in which he refuted some of the current identifications, which, as he showed, rested upon insufficient comparison of the heads in the round with those given as types by the coins.

The meeting was attended by Italian archaeologists, by representatives of the other foreign Schools, and by members of the British colony in Rome.

SIR WILLIAM WHITE ON ENGINEERING WORKS IN AMERICA.*

THOSE who were present at the meeting of the Institution of Civil Engineers last week had the privilege of listening to a most interesting lecture, delivered in the easy and genial style of which Sir William White is so admirable an exponent, and giving an account of the visit to America paid last year by a representative body of the Institution.

One of the most notable features of the reception at New York by the American Society of Civil Engineers, was the appearance of Mr. Charles Haswell, who may justly be described as the father of living engineers, being now in his ninety-seventh year, having been engineer-in-chief of the United States navy more than sixty years ago, and having personal recollection of the *Clermont*, the first passenger steamship built by Fulton.

Before passing on to describe other engineering works in and about New York, the lecturer paid a well-merited tribute to the engineers of the present and past generations who have taken so prominent a part in the development of the city and the surrounding district.

The material for professional sightseeing available to the party was such that a very small proportion could be inspected, and that only an infinitesimal part of what was actually seen could be described in his lecture by Sir William White.

Several photographic and other views of the Rapid Transit Subway were exhibited, showing the excavation of the subway, the constructional features of the steel-work for supporting roadways and buildings, sections of the tunnels below the Harlem and East Rivers, and a viaduct in the above-ground portion of the line. We have at various times published particulars relative to this great work, and for this reason it is unnecessary to mention the details quoted by the lecturer.

The methods of construction followed in New York, involving great inconvenience to residents and disturbances of street traffic, would never be sanctioned in London, but in that place the city authorities approved the scheme and individuals had to submit.

A question closely associated with the problem of rapid transit is the construction of high buildings, which is justified in New York by the geographical situation and the enormous growth of the commerce and population of the city. Public records reveal the fact that in New York there are two hundred and fifty buildings of ten stories and upwards, the average cost of which has been 200,000*l.* each, some of the largest having cost 700,000*l.* to 800,000*l.* each, and thirty of the most prominent represent a capital expenditure of 20,000,000*l.* The day population of these great buildings is truly enormous, and in one case amounts to nearly 10,000 persons. During certain hours in the morning and evening the human flood streaming towards and pouring out from the tall buildings overflows from the pavements into the roadways, and, as the lecturer remarked, could not be dealt with but for the belief prevailing in America that "no vehicle is full while it remains at rest." Trams pass along crowded thoroughfares with passengers hanging on at either end and closely packed inside, and cars on the elevated railways are similarly crowded. This is a picture of New York which we have no desire to see reproduced in our own metropolis.

Congestion of traffic across the East River is almost as bad, but the completion of the two additional bridges now under construction will do something in the way of improvement. These four bridges, representing an outlay of some 15,000,000*l.*, will provide collectively for the passage of nearly two million persons daily.

* Postponed from last week for want of space.

But the bridges and subway tunnels do not exhaust the list of works undertaken for dealing with the prodigious floating population of New York. Between Manhattan Island, New Jersey, and Long Island, railway tunnels of which we have already published particulars are in course of construction.

The undertakings here briefly mentioned furnish ample evidence of the ceaseless activity displayed by American engineers in the attempt to modify the natural disadvantages of Manhattan Island as the site of a great mercantile city, and fully justify the words of praise bestowed by Sir William White.

Among the other works inspected the most important is the Croton Dam. This gigantic structure has been in progress for about twelve years, and as soon as the whole of the masonry has reached the height of 180 ft. the filling of the reservoir will be commenced. A notable feature of the contractors' plant is the employment of two steel towers on which derricks are placed high above the work. As the masonry progresses the lower portions of these towers are permanently built in, after being surrounded with concrete. This method of procedure renders unnecessary the frequent shifting of derricks as happens when they are erected upon the masonry itself.

On the conclusion of the New York series of engagements, visits were made to various engineering works in Canada. One of the most interesting was to the Victoria Jubilee railway bridge, Montreal, originally built in 1854-60 as a single-line tubular bridge, and converted to a double-line girder bridge in 1897-8, with a total length including approaches of 9,140 ft.

Sir William White was profoundly impressed by the boundless possibilities suggested by the waterways of Canada, and by the large sums devoted by the Government for the purpose of constructing canals to connect the great lakes with the Atlantic. The resources of Canada in water-power also created a striking impression upon the lecturer, which in turn was conveyed to his audience by the help of several lantern views. Extensive use has already been made of water for the generation of electricity for industrial purposes, although in reality this branch of practical engineering is still in its infancy.

We are glad to learn on the authority of the lecturer that those concerned in the utilisation of water-power have endeavoured to preserve the beauty of the falls while making them serviceable to mankind. The same can scarcely be said of some early works on the American side of Niagara, where the eye of the visitor is seared and his memory distressed by some of the most hideous erections that could possibly be devised. Sir William White showed his audience some views illustrating these and more modern power works at the falls, and gave the comforting assurance that the operations now in progress by the Canadian companies for the development of 440,000 horse-power will be completed with due reverence for the beauty of their surroundings.

Of Chicago comparatively little was said by the lecturer owing to the time available having been limited to the short space of two days. The most interesting visit in Chicago was to the central station and tunnels of the Illinois Tunnel Company. This wonderful enterprise, now nearing completion at a total cost of 4,000,000*l.*, has involved the construction of subways, many miles in extent, below all the principal streets of the city for the purpose of dealing with freight of all kinds by electric traction. Underground stations and sidings have been provided at the great railway stations and in the basements of the chief warehouses and stores, and it is hoped the facilities thus offered will relieve the overcrowded thoroughfares of the business quarter of the heavy traffic now necessary for the conveyance of merchandise.

At the International Engineering Congress of St. Louis more than one-tenth of the total number present was represented by visitors from Great Britain, India, and the Colonies. This large attendance of British subjects is a matter for congratulation, and we are pleased to learn was regarded with high appreciation by American engineers.

None of our readers will be disposed to doubt but that the visit of the Institution of Civil Engineers, as well as those made to America during the same year by other English engineering institutions, have afforded an excellent demonstration of the fellowship existing between American, Canadian, and

British engineers. The cordiality and close association maintained throughout the various functions must have beneficial effects of far-reaching and enduring character, and should tend in no small measure to strengthen the friendly relations already existing between those on opposite sides of the Atlantic.

Perhaps the most significant part of the lecture is to be found in the concluding words, which point out that the development of Canada largely depends upon the execution of engineering works of enormous magnitude, and commend that country as a splendid field for British enterprise and capital. Civil engineers in Canada foresee the initiation of many important engineering enterprises in the near future, and will welcome the advent of young engineers from this country to aid in developing the immense resources of the Dominion. The same may also be said of various other British possessions, which afford excellent openings for the new generation of engineers and opportunities for developing and consolidating the Empire.

SMOKE ABATEMENT.

On Wednesday afternoon a demonstration was made at Page-street, Westminster, of the Greaves' patent apparatus introduced by the Absolute Smoke Abolition Syndicate and applied to a Cornish boiler. The apparatus has been applied to several works in the South of England and cotton mills in Lancashire with satisfactory results. Apart from the special fire-bars recommended by the patentee, the system merely involves:—(1) The construction of the brick bridge at the back of the grate so that by control from the boiler front it may be used either as an ordinary solid bridge or as a split bridge, as desired; and (2) the construction of a diaphragm, about 18 in. behind the bridge, formed of refractory blocks set so that the furnace gases and smoke may pass between them and through horizontal holes in the blocks themselves. In starting the fire a certain amount of smoke is unavoidable, but after a short time the tubular diaphragm becomes incandescent, completing the process of combustion and burning up the smoke. Brief as this outline is, it completely describes the general features of and the effects claimed to be produced by the Greaves' apparatus. So far as it was possible to judge by watching the operation of the boiler during our visit on Wednesday, the claims of the patentee appear to be justified. The boiler was an ordinary one of the Cornish type, the flues being connected with a brick chimney shaft of moderate height. The fuel used was small coal of very inferior quality, the cost being stated at less than 12s. per ton delivered, and we had satisfactory evidence that it was capable of producing smoke very freely when burning in the open air. Inside the boiler furnace we found a good deal of smoke was continuously given off by the fuel, while practically none was visible at the top of the chimney shaft. These observations were all that could be made during the demonstration, but they sufficed to give a favourable impression of the merits possessed by this simple system of treatment. For the present the company propose to limit attention to Cornish and Lancashire boilers, but at a later date they hope to adapt the patent to marine and locomotive boilers and domestic fire stoves.

THE SURVEYORS' INSTITUTION.

An ordinary general meeting of the Surveyors' Institution was held on Monday at No. 12, Great George-street, Westminster, S.W., Mr. Charles Bidwell, Vice-President, in the chair.

The Chairman explained that the President had slipped in the street and had injured his leg seriously, and was quite unable to be present that evening. They would all sympathise with their President, and hope to have him with them at the next meeting.

The minutes having been read and confirmed, Mr. Percival Currey, Hon. Secretary, read a list of donations to the library and the library fund, and a vote of thanks was accorded to the donors.

Presentation of Gold Medal.

The Chairman said it was his pleasing duty to present, on behalf of the Council, a gold medal for the best paper read last session. The Council thought it would be wise, and of advantage to the Institution, to grant a gold medal each year

for the best paper read before the Institution as an incentive to gentlemen preparing papers. The gentleman selected by the Selection Committee, who had carefully gone through the papers read last session, to receive the medal was Mr. J. Smith Hill, an Associate of the Institution, and Principal of the Aspatia College, Carlisle, for his paper read at the Newcastle meeting of the Institution. The paper was historical and of considerable value, and he congratulated Mr. Hill upon it, and had great pleasure in presenting him with the medal.

The Chairman then presented the medal to Mr. Hill, who said the award had been as unexpected as it was appreciated by him.

Urban and Rural By-laws.

The Chairman said they were to hear two papers, one by Mr. A. R. Stenning on "Urban and Rural By-laws and Suggested Amendments," and another by Mr. W. Menzies on "Building By-laws in Rural Districts." The subjects had created a good deal of attention recently, and it would be desirable to adjourn a full discussion until the next meeting.

Mr. Stenning said the object of his paper was to indicate some of the more cogent reasons for the amendment of the by-laws now in use by a great many of the urban and rural district councils and to elicit the views of members with reference to the hardships often experienced in their application, so that they might be in a position to frame some practical suggestions for consideration by the Local Government Board in the hope of inducing the department to bring the by-laws into closer correspondence with existing needs. He proposed to deal only with those by-laws which relate to streets and buildings.

The author, having referred to the Public Health Act of 1875, and particularly sections 157, 158, and 159, and under the three sections of the Local Government Board published, by way of suggestion, a set of model by-laws for the use of urban districts, incorporating therein many of the provisions of the Building Act of 1855. A glance at the headings of many of the by-laws comprised in the model series conveyed the impression that they relate primarily to "new streets and buildings," abutting on new streets, for he could not find in them any reference to existing buildings or alterations to existing buildings, and looking at section 159 of the Act of 1875 it would seem that any alterations or additions could be done to an old building without reference to the by-law. There was a section in nearly all the local by-laws permitting alterations to be made if the open space at the rear of the building was not reduced below the authorised limit, thus implying that alterations, and consequently additions, might be made; but there was no mention of the necessity of notice or deposit of plans of such alterations, and it might therefore be considered that no notice or plans were necessary, though district councils assumed they have the power to demand plans, and often obtained them. He had in practice submitted plans of new buildings, but not for alterations and additions to old or existing buildings. In further proof of his contention, most of the by-laws of different authorities which he had consulted were principally concerned with the construction of new streets, and very little, if at all, with existing buildings. As regards the question of new streets, it was very curious to observe that, although the width of a street was required to be not less than 36 ft., which was to include a roadway and two footpaths, many of the by-laws stated not only that streets were to be 36 ft. wide, but that there shall be, in addition to a width of 36 ft., a footpath on either side, making the street 48 ft. wide between fences. The section he referred to states that every person who shall lay out a new street which shall be intended for the use of a carriage road shall so lay it out that the width thereof shall be 36 ft. at least. It further provides that the carriage-way of such street shall be 24 ft. in width, and goes on to say that there shall be constructed on either side of such street (which is to be not less than 36 ft. wide) a footway of not less than one-sixth of the entire width of the street. He had asked several surveyors to local authorities what they considered this by-law to mean, and they had admitted that the only strict interpretation of it was that the two footpaths were to be additional to the width of the street; but this was not generally required, and a new street need only be not less than 36 ft. between the fences. Even if this stood alone it showed that

the by-laws required some reconsideration. Nowhere in them, as far as he was able to trace, was there a definition given of a new building. Some three years ago, when making alterations and additions to his own house in Sussex, the local authority requested him to send in plans, saying it was a new building, and a long correspondence ensued. He challenged the authority to contest the question, but they evaded it, and he never submitted any plans. In country districts, to supply a block plan 44 ft. to an inch, and show on it the adjoining owners, who might be 300 or 400 yards away, as in his case (and in many cases much further), was quite unnecessary, and this requirement was, he thought, intended only to apply to new streets, where houses would be erected close to one another. Section 159 only said what might be deemed to be a new building in the re-erection of a building pulled down to a certain extent; but this did not carry us very far, and the only case he could find bearing on the point was *Shiel v. The Mayor of Sunderland*.

He thought it might be taken for granted that all the building by-laws had to be framed on the Act of 1875 and under the three sections 157, 158, and 159, and there could be no doubt that the intention of those sections was to give urban authorities power to deal with new streets and new buildings in towns, and that it was never intended to apply them to rural districts. Indeed, this point seemed to have been noticed by some of the authorities at Whitehall, as the President of the Local Government Board said, in answer to Sir William Grantham's deputation, that he had found, on assuming office, and being himself a landed proprietor, that urban by-laws might well be modified, and the Board had in consequence framed a new set of by-laws for rural districts which bear the date, May, 1903. These amended model by-laws of 1903 would, if reasonably and intelligently applied by the authorities, have the much desired effect of considerably reducing the cost of building in rural districts. Speaking generally, the amended by-laws deal with sanitation only, although (unfortunately, as he thought) one by-law had been introduced prescribing the deposit of plans—a requirement from which arose the proceedings between the Chisleley District Council and Sir William Grantham. Being a landed proprietor who had erected many cottages, and generally improved the village where he resided, Sir William Grantham was called upon by the local authorities, under the 1903 by-laws, to submit plans and indicate the class of building he proposed to put up. On receiving the notice he at once stopped his building and deposited plans, which (he the speaker), at any rate, considered complied with the requirements of the by-laws. The Council, however, thought otherwise, and when Sir William asked what it was they required they declined to tell him, and having summoned him, what could he do but defend himself? He offered arbitration, but that also was refused, and the finding of the magistrates showed in effect that where opinions differed they were not able to say which side was in the right. The new model rural by-laws provide for all things necessary as regards the construction of buildings from a sanitary point of view.

Suggested Reforms.

He thought he had stated enough to show that both sets of by-laws—viz., the urban by-laws under which most of the urban councils act, and the model rural by-laws of 1903—still required some amendment. In his opinion it should be compulsory on every authority to adopt by-laws which should be uniform throughout the country. Variations between the by-laws of different districts tended to confusion, and, where owners possessed estates in more than one district, led to uncertainties as to their position in respect of them. In no case should it be left to the discretion of any local authority to determine whether to adopt urban or rural by-laws. It very rarely happened that the circumstances in a district differed sufficiently from those which obtain in other districts to justify the granting it an option to say when a change in its by-laws should take place; any change of the kind should be of general application, and its adoption made compulsory. The object, therefore, should be to have such general by-laws made as would apply to the whole country and also meet the requirements of rural districts, by means of exemptions, such as those contained in the London Building Act, 1894, section 20,

sub-sections 10, 11, and 12. It should not be difficult to frame one set of by-laws applicable alike to towns and to rural districts. The present schedules as to the strength of walls might remain if a clause were inserted that all buildings situated, say, 8 ft. away from a public street or highway, and 15 ft. from an adjoining owner, and 30 ft. from an adjoining building, shall be exempt from the general operative clauses. The effect would be that buildings being a sufficient distance apart to prevent the possibility of the spread of fire could be erected of any material, and directly they ceased to fulfil this condition they would become subject to the by-laws requiring walls of certain material and thickness. Buildings in a rural district would then be free from the costly requirements now so often enforced, and no question could arise as to when a district would pass from the rural to the urban category.

He thought, further, that there should be a proviso that if it be desired by an owner to erect four buildings in one block for the working classes, not exceeding three stories in height, viz., ground and first floors, with attics in the roof, that he should be at liberty to do so; but should an authority consider that such buildings were not suited for the locality, they should have the right of appeal to some tribunal specially constituted for dealing with such matters.

The deposit of plans had never been required in London. The district surveyor had the Building Act to work by, and he (the speaker) considered that it was unnecessary to require that complete plans, or any plans of a building, should be deposited with the authority, especially when one considered who the authorities were, and who their advisers, for it only gave them an opportunity of raising frivolous questions, as in the case of the Chailey Rural District Council. It would be enough if notice were given to the authority by anyone intending to build, and a simple form for the purpose should be obtainable from the authorities, on which should be stated the class and exact position of the building intended to be erected, so that their inspector should have the opportunity of assuring himself that the by-laws as regards sanitation were not being infringed in any way, and whether or not it fell within the exemptions as regards construction and material.

When the deputation was before the President of the Local Government Board the President spoke strongly as to the class of surveyor frequently appointed, and considered some alteration to be required in this respect. In many parts of the country the surveyor, so-called, had never had any proper professional training, and only understood his business in a very elementary way. Many of them had been carpenters or small builders, and were, often erroneously, supposed to have some technical skill. It occasionally happened also that a district councillor with a mere smattering of knowledge exercised an influence out of all proportion to the real value of his opinion.

It would be well if the by-laws prescribed a minimum size for the rooms in houses designed for the labouring classes, also a minimum height, and the proportion which the area of the window should bear to the floor space. The framing of by-laws for these purposes was contemplated by the new rural by-laws of 1903, and it would be an advantage if the form they took were considered by a joint committee of the Institution, and the Royal Institute of British Architects, associated with representatives of the Local Government Board.

As regards the width of roads, he considered 24 ft. ample in cases where small property was about to be erected, viz., a carriage-way of 15 ft., and a 4 ft. 6 in. footpath on either side, and when this was provided there should be a stipulation that the building line shall be 10 ft. from the fences so as to give a total distance of 44 ft. between the buildings, instead of what was often the case, 36 ft., which brought the houses quite on to the road. Some regulations might also be made in this connexion as to lines of building frontage. The question whether a road should be 36 ft. in width or 24 ft. in any particular case, was a matter that should be referred to the surveyor to the County Council. He knew of two instances where landowners, if they could have constructed a street or road 24 ft. wide, would have laid out and for cottage building. In one case, owing

to the nature of the ground, it was only possible to get one building frontage, but as the authorities in both instances required a road 36 ft. wide, the cost of making and maintaining it was considered prohibitory. Although roads were prescribed 36 ft. wide, with a footpath on each side, there was no definition or description given of the materials of which they were to be formed. Nor did the by-laws make it absolute that roads should be made before the houses abutting on them were built or occupied. According to the by-laws, it seemed to him that a road could be set out and a plan submitted, but that the authority had no power to compel that road to be made, so the new by-laws should provide for this, and it should not be necessary to indicate the size of plots and class of houses, as was now the case, since it was admitted that although a plan submitted might show plots of a certain size, there was nothing to prevent these being altered, and rightly so, because an owner might find by experience that the class of house he first proposed was not the most suitable.

As the by-laws were to be administered by rural district authorities (and he did not see what other authorities would be substituted, unless all buildings were to be put under County Council supervision) he considered that builders should be disqualified from sitting on rural District Councils. This might perhaps appear a somewhat arbitrary suggestion, and might be resented by the builders, but there was no class more difficult to deal with than the small builders with a little knowledge; and, estimable as many undoubtedly were, they were not, as a rule, desirable members of District Councils. He knew that to exclude them would mean the loss of some willing workers, but, on the whole, the public would, he thought, benefit.

As already stated, there should be a tribunal of appeal, accessible to both parties, on all matters of dispute that might arise. This tribunal might consist of some professional men, preferably architects and surveyors in practice in the towns in which the County Councils meet, and might include the surveyor to the County Council, or persons nominated from time to time by the Presidents of the two Institutions. This would tend to modify the very arbitrary procedure under the by-laws, whereby the local authorities may claim the right of pulling down buildings if they consider that they contravene the by-laws. If the decision of the tribunal were not carried out proceedings could be taken to enforce it before the Court of Petty Sessions, which meets, as a rule, once a fortnight, so that very little delay would be entailed. This would be merely adopting the principles of the London Building Act, where in the case of a notice being served the order can only be enforced after the matter has been dealt with by the police magistrate. Of course, it might happen that in the country such a body of men might be got together, as at Lewes, where, in the recent case of Sir William Grantham, they took the mistaken course of trying to act a friendly part and to bring about a compromise, instead of exercising their judicial power in coming to a definite decision. He therefore regarded the establishment of a tribunal of appeal as most important in the interest of all parties.

A modification of the by-laws in the way he had suggested would tend to soften all the harsher building restrictions so often complained of in rural districts as interfering unduly with the erection of houses for the working classes.

It had been said that the by-laws were designed for the repression of the jerry-builder. That might be the case in urban districts, and, so far as they were concerned, he would not for one moment suggest that the restrictions should be in any way relaxed, but in the rural districts the jerry-builder was practically unknown. But, as a matter of fact, it was the big landlord, or the small man who had saved a little money, who, in the great majority of cases, put up cottage property, and both might be trusted to build in a reasonably substantial and enduring manner. It was necessary to provide houses in urban and rural districts for the working classes as cheaply as possible, and such houses, so long as they were weather-tight and in a sanitary state, and kept so, answered their purpose if they only lasted a certain number of years.

And new by-laws should embody better and fuller definitions than is at present the case as to what constitutes a "new building." The by-laws should also state clearly the

sections under which the local authority have power to act. The reasons for their disapproval should be given in writing, and their requirements fully stated in all cases. The principle on which the Local Government Board proceeded was that the local authorities should themselves apply for these powers, and should be at liberty to suggest such special by-laws as they considered applicable to the special circumstances of their district. He regarded this as a mistaken policy, for he knew of no special reasons why one district should wish to be treated differently from another, and he was convinced that by-laws could be so framed as to meet every case, as was done in London under the provisions of the Building Act.

He was satisfied, from opinions he had gathered from surveyors to urban district councils and from councillors themselves, that the present by-laws and the system under which they were adopted and administered were not satisfactory, and he would urge the members who had influential clients to use their best endeavours to bring pressure to bear upon the Local Government Board to withdraw them and to introduce others less open to objection. He did not think an Act of Parliament would be required for the purpose. It could be done, without further legislation, under the Public Health Act of 1875 and its amending Acts.

Building By-laws in Rural Districts.

Mr. Menzies said that the several matters, with respect to which rural authorities had made, and might still, under section 157 of the 1875 Act, make by-laws relating to new buildings, were as follows:—(1) The structure of walls, foundations, roofs, and chimneys, for securing stability and the prevention of fires, and for purposes of health. (2) The sufficiency of the space about buildings to secure a free circulation of air, and the ventilation of buildings. (3) The drainage of buildings, water-closets, earth-closets, privies, ashpits, and cesspools; the closing of buildings or parts of buildings unfit for human habitation, and the prohibition of their use for such habitation. Section 157 also gave power to provide for the observance of the by-laws, by enacting therein such provisions as the authority might think necessary as to giving notices, deposit of plans and sections, inspection by the authority, and the removal, alteration, or pulling down of any work begun or done in contravention of the by-laws. Section 183 of the 1875 Act enabled rural authorities to insert a clause in their by-laws imposing on offenders penalties for infringement of any by-laws made by the authority. Numerous rural authorities availed themselves of the opportunity offered to make building by-laws under the 1875 Act, and, having obtained from the Local Government Board the requisite powers, issued by-laws which had to be approved by the Local Government Board, and were practically the same as the model urban series, drawn up in 1877 by that Board, and containing about one hundred clauses. The Public Health Acts Amendment Act, 1890, gave rural authorities power to adopt such parts of Part III. as were applicable to rural districts, whereby under section 23 (3) (4) they might extend their existing building by-laws, made under the 1875 Act, by adding clauses dealing, in the case of new buildings, with the structure of floors, the heights of rooms to be used for human habitation, the keeping of water-closets supplied with sufficient water for flushing, and the prevention of the alteration of buildings (erected in accordance with by-laws made under Public Health Acts) in such a way that, if at first so constructed, they would have contravened the by-laws. Rural authorities might also go further, and obtain from the Local Government Board, under section 5 of the 1890 Act, powers to add other by-laws dealing with the structure of new hearths and staircases, and the paving of yards and open spaces in connexion with new dwelling-houses, while existing by-laws with regard to drainage, water-closets, earth-closets, privies, ashpits, and cesspools, and the keeping of water-closets supplied with sufficient water for flushing might be made to apply to old buildings as well as new.

It would be seen from the foregoing how very extensive were the powers which, either by adoption, or by an order of the Local Government Board, could be conferred upon rural authorities in the matter of making building by-laws. In the case, however, of rural authorities not possessing by-laws under the 1875 Act,

but desirous of doing so under the 1890 Act only, they might either by adoption, or by urban powers conferred by the Local Government Board, make by-laws for the whole or part of their district, and relating to any or all of the subject-matters referred to; but with this one important distinction, that whereas a code of by-laws under the 1875 Act deals with the structure of walls, foundations, roofs, and chimneys, for securing stability and the prevention of fires and for the purposes of health, the code under the 1890 Act could be limited to the structure of walls and foundations of new buildings for purposes of health.

For the guidance of rural authorities, the Local Government Board issued in 1901 a model series of by-laws, framed upon the powers which could be conferred on rural authorities by the 1890 Act, and required, so far only as the actual structure was concerned (a) a layer of concrete or asphalt under the floors of a domestic building, whenever the dampness of the site or the nature of the soil rendered such a precaution necessary, (b) a horizontal damp-course in a new public building or dwelling-house, and double walls to act as a vertical damp-course where any part of the lowest story of the building was below the ground level, (c) coping, or otherwise protecting, parapet walls.

It had been the custom, where local authorities had decided to issue building by-laws, which must be confirmed by the Local Government Board, for that Board to supply the authority with a model series, and it was in consequence of the adoption in the past by rural authorities of the clauses contained in the urban model series issued in 1877, which the Local Government Board considered equally suitable for rural districts (and, in fact, pressed those authorities to adopt *in toto*), that the agitation had arisen for amendment to enable people to substitute some cheaper form of construction than brick, stone, or other hard and incombustible materials. The position of affairs was that rural authorities possessing by-laws framed on the 1877 model series had no power to approve plans of buildings constructed in any other way than as laid down by their by-laws. No dispensing power was given them to depart from a by-law when once made, nor was there any legal process by which they could be compelled to make, or alter, any by-laws. Hence a rural council was all powerful; for it might resolve whether to have by-laws or not, and, having got them, might decide either to alter its by-laws, if thought expedient to do so, or to adhere strictly to all the clauses. The Local Government Board could ask councils to revise by-laws, when it had been represented to that Board that revision was needed; but they could do no more. The initiative for either making, repealing, or revising by-laws rested with local authorities alone. Judging from the interest now aroused in this matter in various parts of the country, legislation would, no doubt, be sought, either to enforce the amendment of existing by-laws, where it was evident that they could with advantage be amended, or to impose on rural authorities discretionary powers, with the option of appeal on the part of the person who intends erecting a building if he considered these powers were insufficiently or improperly applied, unless meanwhile the Local Government Board was able to persuade rural authorities whose by-laws were found to be oppressive to modify them. Modification, however, should not mean going from one extreme to the other, which he ventured to think was the case with the two model series of 1877 and 1901 with respect to the clauses dealing with materials and method of construction. By the 1877 series nothing but brick, stone, or other hard and incombustible materials, properly bonded and solidly put together, etc., were permitted, but by the 1901 series anything might be used for the foundations, walls, and roof. He knew of a case where by-laws were recently made practically word for word the same as the 1901 model series, and there was nothing to prevent persons from erecting buildings in any part of the district where these by-laws were in force of absolutely unsuitable materials, whether the site be in a populous or a sparsely inhabited area. This appeared to him to be anything but desirable, and he thought it only reasonable that some powers should be exercised as regards materials and construction, and that no important departure should be made in these respects from the 1877 model series,

unless the proposed building was to be isolated. A difficulty arose as to maintaining this isolation, and practically it was impossible to do so. Hence there was all the more reason why there should be power to exercise some control over the structure of buildings, which might be isolated to-day, but not so to-morrow. The provision of a damp-course, also, of concrete, upon ground floors, and means to prevent damp soaking down parapet walls, were certainly not unreasonable, and, in fact, he should feel inclined to insist, under any circumstances, upon a layer of concrete over the site of a dwelling, rather than leave it an open question as to whether the dampness of the site or the nature of the soil rendered such a precaution necessary. Air space and ventilation were essentials, and few would cavil at the requirements which the Local Government Board considered proper—certainly not those who were desirous of erecting dwellings in purely rural localities; but at times circumstances arose where the required open area at the rear of a dwelling could not be secured, although there was ample space at the side or sides. To lay down hard-and-fast rules to deal with every case that might arise was, however, almost impracticable, but it would be well if by-laws contained provisions under which exceptional cases could be dealt with. Some of the requirements in building by-laws as to closets, cesspools, and drainage generally, might, with advantage, be modified under certain circumstances where purely rural conditions prevailed. The clause giving power to close buildings considered unfit for human habitation appeared to him superfluous, seeing that there was power under the Housing of the Working Classes Act to deal with buildings unfit for occupation, whether there were building by-laws or not. The requirements as to notices and deposit of plans of the intended building, as set forth in the 1901 model series, did not appear to him unreasonable—viz., that a plan and section of the intended building, drawn to an eighth scale, should indicate, "so far as may be necessary to show compliance with the by-laws," the position, form, and dimensions of the building, as well as the sanitary arrangements; but to be called upon to show to a scale of 44 ft. to the inch the buildings and appurtenances on properties immediately adjoining the building site was unreasonable, as such a requirement could not really be enforced, for the owner of the adjoining plot could object to anyone making a survey of his holding.

Mr. Arthur Vernon (Past-President), in proposing a vote of thanks, said the question was whether the by-laws were in such a state that something must be done to put them on a satisfactory footing, both for the sake of the authorities and those who build under them. He represented both sides of the question, for he was not only an architect and surveyor, but for thirty-five years he had belonged to a corporation in the country which now represented 17,000 or 18,000 inhabitants, and he could speak from experience of the troubles and conflicts authorities had in regard to these by-laws. All who had had experience of this kind must feel that the position at the present moment was not only unsatisfactory to all concerned, but it was positively injurious to the public interests. The mistake arose from the initial management of the subject: it was attempted to plant the building laws of London in the country—laws applicable to towns but not to the country. The consequence was that there was great inequality, and the by-laws as now applied under the 1875 Act and other Acts did not cover the whole of England by a very long way, and the by-laws that existed were charming in their variety and bewildering in their inconsistency. He hoped the matter would be speedily and thoroughly put into a satisfactory state. It was not satisfactory to apply stringent by-laws to batches of districts, so that one place might be favoured and another not—one might have one set and another place a different set. It restricted building, produced confusion, and involved trouble between landlord and authority. But the by-laws, as a whole, had been of great benefit to the country at large; they required to be extended and altered. The present by-laws were often inconsistent, partial, and execrable in their application in the country, and some power was required in order to check local authorities; the standard should be kept up, but more latitude should be

allowed. What he looked forward to was to see the Local Government Board, in conjunction with bodies like those mentioned by Mr. Stenning, arrange to apply to the whole of England by-laws applicable to all parts. He did not mean one set of by-laws, for that was impossible, but cities exceeding, say, 50,000 inhabitants should have one set; urban districts exceeding a population of 10,000 should have another set; and small rural villages a third set. They all sympathised with Sir W. Grantham's bold and manly defence of his own position, without however saying that they would sympathise with plans that were hardly intelligible or descriptions that were not professional any more than Sir William would admire wills or depositions drawn by amateurs.

Mr. H. H. Smith seconded the motion, which was agreed to, and he moved the adjournment of the debate. Mr. Sabin seconded, and it was decided to continue the discussion at the next fortnightly meeting.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. William M. Page, having resigned the joint honorary secretaryship of the Association, it is desired that all communications be now addressed to Mr. Colin B. Cowrie, 31, Mayfield-gardens, Edinburgh.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The ordinary monthly meeting of this Society was held on the 12th inst. in the Lecture Hall of the Literary and Philosophical Society, Leopold-street, Mr. T. Winter presiding, when Mr. Horace Wilson delivered a lecture on the "Law of Easements." He defined an easement as a privilege, in the owner of one piece of land or set of premises, to use or enjoy some right in another person's land, which, while not depriving such other of his possession, curtailed his rights as owner—for example, a right of way across a man's land to one's own land. An easement must reside in the owner or occupier as such, and must be available against another's land or premises; it could not exist separately from an interest in land, or be severed from it by conveyance or will. It was a right without profit, and that feature distinguished it from the rights called profits *à prendre*, i.e., rights of taking something from another's land, as wood for fuel, or stone for repair of walls and roads. It was different also from rights in gross, i.e., rights given to persons independently of the ownership of land, such as a public right of way. An easement imposed on the owner of the land subject to it only a duty to suffer something, or refrain from doing something, for the benefit of his neighbour; for example, the grantor of a right of way was only bound to allow the use of the way, not to keep it in repair; and similarly in the case of ancient lights, he was only obliged to refrain from obstructing the light. The most important easements were those in respect of the right to support of land by adjacent and subjacent soil, the right to the use of drains and party walls, and the right to light and air. No man could, as a general rule, excavate in his own land, or work minerals, in such a way as to cause his neighbour's land to fall in; but the obligation to support as against adjoining land bound only so much of it as was necessary to support the land in its natural state. Nor did the right to support from subjacent soil prevent the adjoining owner from draining his land as he pleased. Neither of these rights was a right to have the whole or any part of the adjacent or subjacent soil left in its natural state, but simply a right not to have one's land injured by anything done, however carefully, in the adjacent or the underlying soil. And this right, in its turn, might be subject to an easement in the adjoining owner to work in his land so as to cause a subsidence. With regard to the right to support of buildings the main principle was that when anything had been done to increase the lateral pressure, as by erecting buildings, no man had a right to such increased support except for "ancient" buildings, i.e., buildings at least twenty years old, for which the support had not been acquired by fraud, stealth, or the mere revocable permission of the servant owner. A grant of land, however, for the express purpose of building upon it created a legal easement to such an extent as might be necessary for enabling the grantee to build the premises and enjoy them in safety when properly built, but the owner of

the house was not entitled to do anything to increase the burden on the other owner, and must keep his house in repair. Again, the right to support of buildings by buildings might be acquired by prescription, provided that the adjoining owner must have been aware from the very nature of the building that support to it was necessary. An action would be for damage caused to a neighbour's building by negligence in law, but not always for negligence in fact; in other words, if there existed an easement of support, and the adjoining owner invaded that right, he would be liable in damages however carefully he might have done the act complained of, but if not he would not be liable if he took proper care in the execution of the work. The lecturer next dealt with the topic of party walls, pointing out the varying meanings of the term, and the uncertainty of the principles applicable, and stating that, outside the metropolitan area, the subject was regulated to some extent by the local by-laws. The right to the use of drains now depended on the Public Health Act, which entitled every person within the district of a local authority to empty his drains into their sewers, upon complying with their requirements, and provided a means of compelling local sanitary authorities to make a proper system of sewerage for their respective districts. The local authority was, under the Act, the sole judge of what was necessary for the proper construction and repair of all drains within its district. The Act gave very wide powers as to sewers, and the operations of local authorities in these matters too often had the evil results of causing persons whose lands were injuriously affected, either to make unreasonable claims for compensation, or of driving them into the expense, delay, and annoyance of arbitration under the Act. The lecturer briefly explained the system and procedure laid down by the Act in connexion with these matters, and then passed on to the easement of light. As to this, he traced the alteration of the law under the influence of modern town life, and pointed out the tendency of the courts to restrict the easements to such an amount of light as was actually necessary for the use of the particular premises, rather than to confer a right to the continuous enjoyment of all the light that had formerly had access to the building. The "45 degrees rule" was at first very much favoured, but it seemed to have fallen upon evil times latterly, and had recently been declared in the Court of Appeal and the House of Lords, to be worth very little as a guiding principle. Some of the leading decisions with regard to easements were adverted to and explained. On the motion of Mr. T. Windler, seconded by Mr. E. M. Gibbs, supported by Messrs. E. Bramley, W. J. Hale, H. L. Paterson, and W. C. Fenton, a hearty vote of thanks was accorded to Mr. Wilson for his lecture.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—The annual dinner of the Leeds and Yorkshire Architectural Society was held on the 19th inst. at the Queen's Hotel, Leeds. Mr. G. Bertram Balmer, President, occupied the chair, and amongst others present were the Lord Mayor (Mr. R. Armitage), Mr. Rowland Barran, M.P., Dr. Bodington, Mr. Alfred Derbyshire (Vice-President of the Royal Institute of British Architects), Col. Edmund Wilson (President of the Thoresby Society), Mr. J. W. Beaumont (President of the Manchester Society of Architects), Mr. Herbert Davis (President of the York Architectural Society), Mr. Butler Wilson, Mr. George Corson, Mr. W. J. Locke (Secretary of the Royal Institute of British Architects), and Mr. George Ward (President of the Leeds Institute of Science and Art), and Mr. R. P. Oglesby (hon. secretary). After the toast of the King had been duly honoured, Dr. Bodington gave the toast of "The Royal Institute of British Architects." He had read recently, he said, that "architecture was an art esteemed and encouraged in all enlightened nations as tending to promote the domestic convenience of citizens and the improvement and embellishment of towns and cities." He wondered, if the embellishment of towns and cities were taken as a sign of the enlightenment of a nation, how far an impartial critic would say that we were an enlightened nation. He supposed that in the whole history of the human race there had never been a time in which wealth had accumulated at the same rate as it had in England during the XIXth century. But had the embellishment of our towns and cities kept pace with the rapidity of the growth of our wealth and the rapidity with which our population had aggregated

into great and growing centres? He doubted whether an answer in the affirmative would be just. He could not help contrasting present-day conditions with the conditions which existed in ancient Greece—a poor country whose monuments, as they abounded in their present state of decay, were an example to later ages. Why was such a large proportion of the national wealth of Greece lavished on its public buildings, splendid temples, and town halls? The answer was, he thought, to be found truthfully recorded in the words of Professor Butcher: "To the Greek the city was the embodiment of the people's nobler aspirations"; and again: "To the Greek simplicity of the home and splendour in the city—that was the principle." Was not the principle at the present time? Splendour in the home and meanness in the city? Yet he would not be entirely a pessimist. The great democratic bodies which now governed our cities and county areas were becoming sensible to the dignity of their own position, and, at the same time, there were manifest signs that that dignity was being expressed in the buildings which it became their duty to erect or improve. Speaking locally, he would like to see the Corporation in possession of more control as to the height of buildings, and as to those advertisements which often disfigured them.—Mr. Alfred Derbyshire, in replying to the toast, said that the wisest thing the Institute had ever done was to open its arms to members of the profession in the provinces. The Institute had done many things deserving of gratitude; it had made certain suggestions for the guidance of competitions; indeed, everything it had done had been for the good of the profession and in the interests of the public. The question of registration was now being seriously discussed by a committee of the Institute. It was a matter of vital importance not only to the profession but to the Institute itself. A committee had been appointed to inquire into the subject, and upon their report, which would shortly be issued, steps would doubtless be taken to promote a Bill in Parliament for the registration of architects.—Mr. W. J. Locke proposed "The Allied Societies," and alluded to the International Congress of Architects which would take place in London in July of next year. He hoped that the allied societies would attend in good numbers.—Mr. J. W. Beaumont, of Manchester, replying to the toast, remarked that in numbers his Society was the largest of all the allied societies. He mentioned the education of students as an object which ought to be encouraged by allied societies, adding that last year the Royal Institute made a grant of 25*l.* to the Manchester Society for educational purposes. He approved the principle of registration, and said that whilst it would not prevent an unregistered man, say an auctioneer or estate agent, from making plans, it would give the registered person a valuable status. It had been said that registration would shackle art, but he could not understand that argument. He failed to see how education could possibly destroy the artistic qualities in a man.—Mr. Butler Wilson, of Leeds, submitted the toast of "The Houses of Parliament."—Mr. Rowland Barran, M.P., replied to the toast. "If," he said, "we are to reach the ideal in architecture, which has been foreshadowed to-night, it must be by putting greater power into the hands of the architects who are allied to the great societies, and it must be to some extent by a process of exclusion of those who have not fitted themselves as members of the great profession." Bad buildings were an expense to the nation, and were an unnecessary waste of the nation's resources. One might, indeed, go further, and say there were many defects in bad buildings which recoiled upon us in our great cities, and entailed serious expense to the community by the clearances which had often to be effected. It was not sufficient that buildings should be regulated by by-laws; the initiative should come from those who had the actual work to do. Speaking on the subject of by-laws, he was convinced that it would be a great advantage if those who had the supervision of architects' plans under local governing bodies were more thoroughly qualified for the work. Would it not, he asked, be a great advantage if those gentlemen qualified themselves by examination.—The Lord Mayor proposed "The Leeds and Yorkshire Architectural Society," and commented upon the fact that the blackened atmosphere in our large towns largely spoiled the effect of good architecture. He pleaded for some relief in the monotonous array of red bricks which

constituted most of our buildings. In America the variety of colour was remarkable. "I think," he added, "there is great scope in this country for kiln owners who can manufacture their bricks from different colours of clay."—The President, in responding to the toast, said that the Society was formed in 1876 by a number of young men to promote professional and educational facilities, with the title of the "Leeds Architectural Association," Mr. George Corson being the first President and Messrs. Hall and Thorp secretaries. In 1881 the title was changed to the "Leeds Architectural Society," and again in 1883 to the "Leeds and Yorkshire Architectural Society." In 1885 the Society further consolidated its position by obtaining incorporation under the Companies Act of 1867, and in 1891 was allied with the R.I.B.A. and seventeen other societies. In 1893 the country was divided into districts allotted to the various societies. The work of the Society was mainly professional and educational. Under the first they secured mutual professional action and alliance with the R.I.B.A. and other societies. Under the second they secured classes for both design and construction, and provided prizes for them, and in 1892 a silver medal was struck for annual presentation to deserving students. In 1902 they established a school of Architecture, which was so arranged as to derive the fullest advantages from the facilities offered by the Leeds Institute of Science and Art, and on both the technical and art sides. The R.I.B.A. examinations for associateship were held twice yearly under the control of the Society. Each session there were seven lectures given by experts at the rooms of the Society. A library had been formed for the use of students, and quite recently the library, which had been housed in the Public Free Reference Library, had been augmented through the beneficence of a deceased member. It now numbered 500 volumes. In 1876, when the Society was formed, there were 80 members, and an annual expenditure of 40*l.* In 1905 the membership was 170 and the annual expenditure 200*l.* There was a large amount of work yet before the Society in aiding the Bill for Registration of Architects, at present being dealt with by the R.I.B.A., and also in founding a Chair of Architecture at the Leeds University. It seemed to him that what had been done at Manchester ought not to be impossible at Leeds. He appealed to the wealthy manufacturers and landed proprietors in the neighbourhood of Leeds to assist in this noble work, so that architecturally the Leeds University might be raised to the level of that at Manchester.—The toast of "The Guests" was given by Mr. H. S. Chorley, M.A., and was acknowledged by Mr. J. S. R. Phillips.—Mr. George Corson proposed "The President," and the toast was received with musical honours.

NORTHERN ARCHITECTURAL ASSOCIATION.—On the 17th inst., at a meeting of the Northern Architectural Association at the Y.M.C.A. buildings, Blackett-street, Newcastle, Mr. R. P. S. Twizell, A.R.I.B.A., lecturer on architecture at the Armstrong College, Newcastle, gave a lecture on "The Evolution of Domestic Architecture." Mr. J. W. Taylor, President of the Association, presided. The lecturer said the earliest forms of houses in Great Britain were of round or oval shape, built of wood and basket work, and made wind and watertight by a plastering of mud and clay, the top of the hut being thatched with reeds or some such material. At a later date houses were built of stone in imitation of these round huts. Improvements were gradually made, although wood still remained the principal building material, and continued to be so during the Middle Ages, except in the case of some few houses and the dwellings of large landowners and border lords. At the time of the Norman Conquest the manor house of either a Saxon or a Norman consisted of an entrance porch with a hall on one side and a bower or women's room on the other. The hall became the chief feature of every house during the Middle Ages. It was in reality the house, and hence country houses are still called halls. At the inner end of the hall was the "dais," a platform one step high across the hall, on which was placed the high table, and behind it was usually the entrance to the private apartments. The fire was frequently in the centre of the hall on a hearth of brick and stone, the logs being raised on andirons. Louvres were made in the roof to let the smoke out. This custom continued in many college halls in Oxford and

Cambridge till about 1820. In the hall was transacted the whole life of the household. After the hall the most important apartment was the solar, usually a large apartment, placed at the principal or dais end of the hall, but at a higher level. It was the chamber or private family apartment, and more particularly a ladies' room, and was also used as a private dining-room.

THE VENTILATION OF SEWERS.

THE Public Health Committee of Camberwell reported, on Saturday, that the Lewisham Borough Council has had under consideration the question of the ventilation of the sewers in its district, in consequence of the complaints received from residents as to smells emanating from surface road ventilators. It is of opinion that if the surface road ventilators were to be placed much closer together than at present, steps taken with a view to the repeal of the London County Council drainage by-laws, made under section 202 of the Metropolis Management Act, 1855 (which by-laws require the provision of a suitable and efficient intercepting trap in every main or other drain of a new building), and each house compelled to have a ventilation pipe from the highest point of the drain, each one of these pipes would act as a ventilator to the sewer, and surface gratings in the road would, in most cases, act as fresh-air inlets. The matter was referred by the Camberwell Committee to the Borough Engineer (Mr. W. Orsby), and the Medical Officer of Health (Dr. Stevens) for a report, and the following had been received:—

There can be no question, but that the ventilation of sewers is a serious difficulty at the present time. That they are bound to be ventilated seems to be agreed, in spite of the experience of Bristol and several other places, for the sake of the health of those who are obliged to work in them. The only means of ventilation, now that house drains can no longer act as such, are either columns discharging at a good level above the road, or open gratings at the road level in the centre of the road. We receive complaints in respect of both of these; in fact, closing the one at the road level and erecting columns is usually followed by complaints of sewer gas blowing in at the upper windows of the adjoining houses. As the Lewisham justly points out, the difficulty has been greatly increased by the gradual interception of all house drains from the sewer, and with the concomitant abolition of the former means of ventilation which were formed by the direct rain-water and soil-pipes. The remedies proposed by the Lewisham Borough Council are that interceptors should no longer be enforceable under the by-laws, and that sewer ventilators should be put nearer together. As the Council is not asked to express any opinion on this latter point, comment is unnecessary. But as regards the non-enforcement on the provision of interceptors, we are both agreed that it is a wise step to take, not only on account of the better ventilation of the sewers, but also, as we have before often insisted, on other grounds. Indeed, we have previously advised that rain-water pipes going direct to the sewer, and not opening near a window should be left connected direct with the sewer, even in houses where no interceptor is provided, and the step proposed by Lewisham is only a little in advance of this. It will, no doubt, be contended that the danger of allowing sewer gas to escape from ventilating pipes attached to houses will be extreme; but we do not think for one moment that the danger is equal to that of allowing the smells from the sewer at the road level, and especially from those owned by the London County Council. For instance, the Albany-road sewer, the Victoria-road sewer, and the one in Denmark Hill. These are good object lessons, no far as evil-smelling sewer ventilators are concerned. By the by-laws of the County Council it is required that an untrapped opening to the drain should be placed as near the interceptor as possible. This is usually closed by a mica flap, more often out of order than in, and it not infrequently communicates with a drain, or rather a miniature sewer, which may take the sewage of ten or a dozen houses. That such a condition of things can and does give rise to nuisance we have experienced, and, in defiance of theoretical sanitation, have ordered that such inlets be closed. Such inlets, however, are prescribed by the by-laws, although we are convinced that the four-foot diameter, in each house to act as a sewer ventilator in comparison with the so-called air inlets will cause less nuisance. It is not necessary to enter into the desirability of interceptors. For when there has been any possible means of getting out of the by-law, we are not ashamed to say we have aided and abetted any plan by which the rule for their enforcement can be evaded.

The Committee, having fully gone into the subject, had decided (subject to the usual sanction) that the Lewisham Borough Council be informed that the Camberwell authority favour the views expressed by Lewisham, and would be prepared to co-operate in approaching the London County Council with the object of obtaining the repeal of the by-law made under section 202 of the Metropolis Management Act, 1855, which requires the provision of a suitable and efficient intercepting trap in every main or other drain of a new building.

Bethnal Green Borough Council, at its last meeting, concurred with the views of the Lewisham Borough Council, and resolved to support the suggestion of that authority.

COMPETITIONS.

COTTAGE HOSPITAL FOR CRIEFF AND DISTRICT.—A meeting of the General Committee in connexion with the proposed cottage hospital for Crieff and district for non-infectious diseases was held in the Porteous Hall, Crieff, on the 11th inst. The Chairman stated that they had met to consider as to the adoption of a plan for the hospital. Fourteen designs had been received, and these had been reduced to a list of four. After considerable discussion as to the adoption of the four plans, a vote was taken on these, the final vote resulting in a recommendation that No. 2 be adopted, subject to such modifications and alterations as the Committee deemed necessary. The plan adopted is that by Mr. Maidment, architect, Edinburgh.

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE-STEEL.—III.

A SIXTEEN-STORY OFFICE BUILDING.

ALTHOUGH the construction of exceedingly tall buildings is not likely to become general in this country, the example forming the subject of the present article is of direct interest, as it serves to demonstrate the suitability of concrete-steel for structures of a type in which the two essential factors are minimum weight and maximum strength.

Until quite recently it has been the practice in the United States to consider that these characteristics could best be obtained by the use of a steel frame veneered with terra-cotta, brick, or stone. Reinforced concrete now offers an alternative, and, in our opinion, a preferable, method of construction. If tall structures can be built successfully in reinforced concrete, it follows that the use of this material is certain to give satisfactory results when applied to buildings of the heights prevalent in Great Britain.

The structure here considered is known as the Ingalls Building, and occupies a site covering an area of 100 ft. by 50 ft. 6 in. at the corner of Vine-street and Fourth-street, Cincinnati, U.S.A. (see Fig. 13). It is built entirely of reinforced concrete, and, although the architectural design is not remarkable for novelty, the structure is worthy of note as the first example of a tall office building in the material mentioned.

In ordinary steel-cage construction, the skeleton is usually erected before the walls, floors, and other details are commenced, and work upon these parts is simultaneously undertaken at various heights from the ground level for the purpose of facilitating rapid completion. Hence, no comparison is possible between such methods of building and those practised in this country. In the case of the Ingalls Building, however, the whole of the operations were conducted in regular succession from basement to roof, the walls and floors of each story being finished in turn before the commencement of work above. For this reason the nature of the operations and details of the contractors' plant deserve careful examination.

Before discussing the details of construction, we will deal with the general features of the building. As will be seen by Figs. 12 and 13, it comprises sixteen stories, apart from the basement and sub-basement, and is rectangular in plan. It stands upon a stratum of firm gravel and sand, and has extended footings for the walls and columns, these footings being situated a little below the level of the basement floors (see Fig. 12).

The old party wall on the eastern side of the building—at the top of the plan—had a concrete footing 2 ft. below the present basement floor level, but, as the new column bases were to be placed some 6 ft. lower, the wall was underpinned and a new footing constructed suitable for the load of 9 tons per linear foot.

The wall at the northern end of the site—at the left hand of the plan—belonged entirely to the owners of the adjoining property, and above the present basement level was carried by columns built into the masonry at intervals

of about 16 ft. This wall was supported on needle beams during the removal of the old and the building of the new footings, the latter being situated about 12 ft. lower than the original depth. Upon the new footings a 21-in. limestone wall was built, surmounted by two 18-in. I-beams for distribution of the column loads. All other loads about the building are transmitted by columns to the foundations, which are described later.

The columns generally are spaced so that the main girders have spans of 16 ft. and 33 ft., the floor panels measuring 16 ft. by 33 ft. The height from floor to floor of the principal stories is shown in Fig. 12, and it may be added that each story between the second and fifteenth floors has the uniform height of 12 ft. 6 in. from floor to floor.

The height of the building from pavement level to the cornice is 210 ft., a particularly noteworthy fact being that the employment of concrete-steel floors permitted a reduction of height equal to 1 ft. for each floor, as compared with the height that would have been necessary if floors with a framework of steel girders had been adopted. This means a total saving in the height of 16 ft., and, taking into account the reduced amount of material for walls and interior fittings, it represents a very considerable economy. The cubic measurement saved is $16 \times 100 \times 50 \cdot 5 = 80,800$ cubic ft., which, even at the low rate of 6d. per cubic foot, is equal to more than 2,000*l*.

Although the walls are built throughout of concrete-steel, they are faced externally with 4½-in. marble slabs up to the third floor, and above that the facing is of glazed brick with terra-cotta mouldings. The marble work is attached to the concrete by means of horizontal grooves cut in the back surface of the blocks and engaging projecting ribs formed on the outer surface of the concrete, as shown in Fig. 14. Anchors formed of thin wrought-iron rods are also employed for holding the marble in position, the metal being embedded in the concrete. The bottom course of the brick facing is laid upon a ledge formed in the concrete, and the brickwork is secured by numerous anchors of the same kind embedded in the concrete. The terra-cotta used in conjunction with the brick facing is secured by means of grooved joints similar to those adopted for the marble facing.

In the ground floor and first stories the exterior window and door frames are of cast iron, a material which the recent Baltimore fire showed to be undesirable for such work, owing to the permanent increase of volume which takes place in cast iron after exposure to high temperatures. In the higher stories of the building the window frames are of wrought iron, a material which is free from the peculiarity mentioned.

For the purpose of permitting the utilisation of space beneath the street pavements, concrete-steel retaining walls were built below the curbs in Fourth and Vine streets, as indicated in Fig. 13. Along Fourth-street, and as far as column No. 18 in Vine-street, the wall is 14 ft. high by 8 in. thick, and has a footing 2 ft. wide. The concrete is reinforced by ½-in. vertical and ½-in. continuous horizontal bars, as in Fig. 15, and at intervals by counter-forts of concrete, from the upper ends of which horizontal concrete-steel struts, forming girders for the pavement construction, are carried back to the main columns (see Figs. 12 and 15). At the corners of the building the retaining walls are bonded by anchor bolts attached to the vertical reinforcement and embedded in the concrete. Between column No. 18 in Vine-street and the north end of the building the retaining wall is 21 ft. high by 24 in. thick at the base, tapering to 8 in. thick at the top. The footing of this wall projects 26½ in. on the outer side and 6 ft. 6 in. on the inner side. After the construction of the retaining walls they were supported temporarily by shores until the columns and girders had been built.

As the street foot pavement practically forms part of the building, it was laid by the contractors. It consists of 16 ft. by 8 ft. concrete-slab slabs 4½ in. thick, and is monolithic with the horizontal girders, or struts, between the retaining wall and the columns. Two intersecting series of ½-in. diam. steel bars form the reinforcement of the paving, these bars overlapping 21 in. at all uprights and angles. The slabs were finished with a layer of mortar consisting of one part of Portland cement and one and a half parts of granite screenings, the upper surface being trowelled

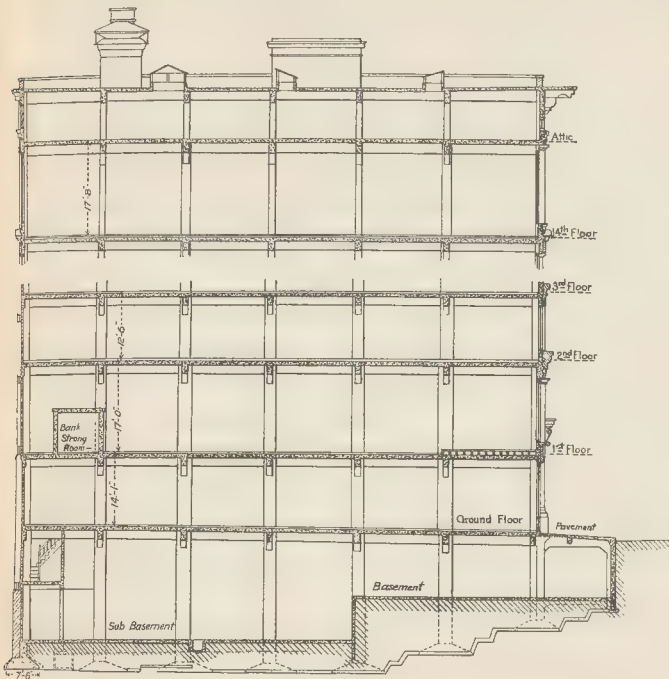
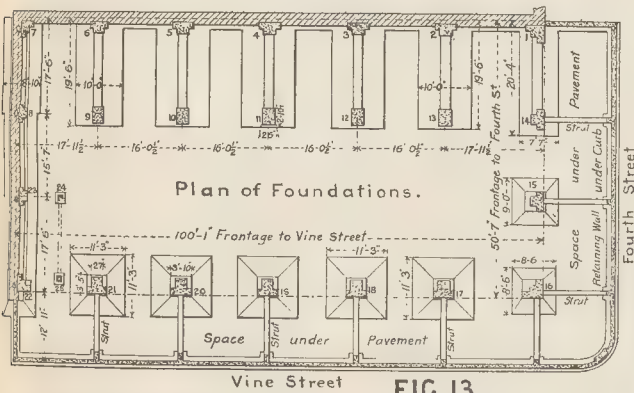


FIG. 12.



Plan of Foundations.

FIG. 13.

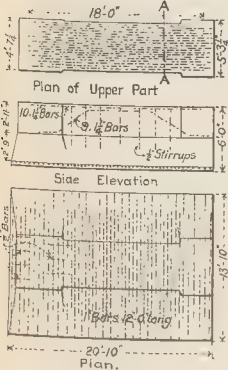


FIG. 16.

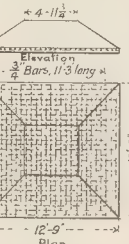
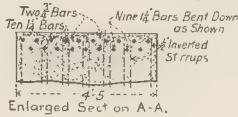


FIG. 17.

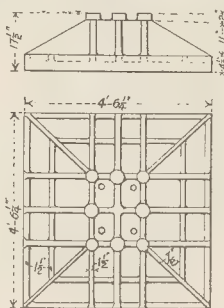


FIG. 18.

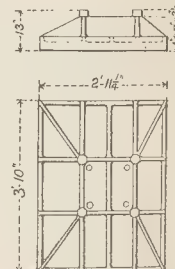


FIG. 19.

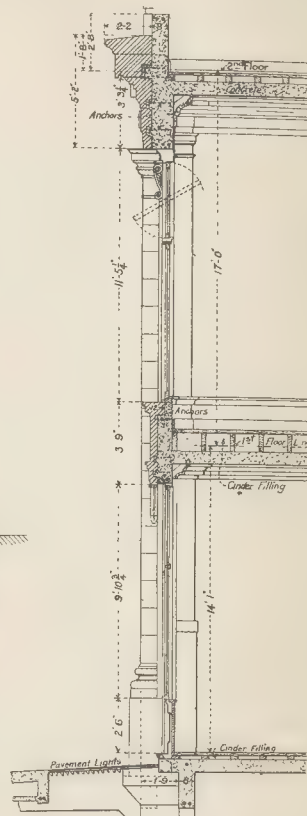


FIG. 14.

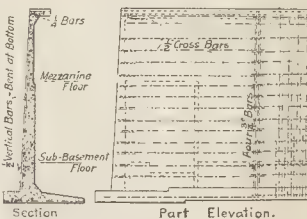


FIG. 15.

smooth and divided into 4-ft. squares by V-shaped grooves filled with asphalt. Finally it was sprinkled with granite screenings before the mortar had set. Below the slabs, a 1-in. steel-lath ceiling, constructed in panels, is supported by wire hangers at the level of the lower surface of the girders. The hangers were embedded in the pavement slabs by being passed through holes in the bottom of the moulds.

A clear idea of the column spacing will be obtained by inspection of the foundation plan (Fig. 13), wherein all the columns are numbered from 1 to 25. The main columns (Nos. 1 to 23) measure 38 in. by 34 in. at the base, and are progressively reduced to 12 in. square at the top of the building, the footings of the different columns varying in dimensions according to the load to be carried.

It will be noticed that nearly all the columns along the street frontages are provided with independent footings, and that the columns in the eastern party wall—at the top of Fig. 13—are supported on footings which also carry the corresponding interior columns. This arrangement was necessary owing to lack of room for the construction of separate foundations along the line of the party wall.

The four drawings in Fig. 16 give the details of a typical footing for two columns, as on the eastern wall of the building. In the lower portion or base of this footing there are forty-nine 1-in. twisted steel bars placed transversely, and below the larger column base eight short ½-in. bars placed longitudinally; in the narrow upper portion the reinforcement consists of two ½-in. and ten 1¼-in. straight bars, nine 1¼-in. twisted steel bars bent as shown in the side elevation, and a series of seven inverted U-shaped stirrups of ½-in. bars. The arrangement of the reinforcing bars is shown more clearly in the enlarged section through A.

In principle, this type of footing resembles the grillage system frequently employed for the support of columns in steel frame construction, and, in addition to being extremely simple and compact, it tends to consolidate the structure. The party wall between the outer columns was formed with them, and, owing to the ample support provided, it was not necessary to build this wall more than 4 in. thick, except around the windows for the purpose of making suitable provision for fixing the window frames.

Fig. 17 contains the plan and elevation of a typical footing for a single column, as on the western side of the building. The reinforcement is situated near the lower surface of the concrete, and consists of twenty-seven ½-in. bars in one direction and twenty-six ½-in. bars in the other.

In every case the foundations were built quite independently of the columns, for each of which a cast-iron base was provided having projecting bosses on the upper surface to receive the vertical reinforcement of the concrete-steel columns. All these bosses were faced to a true horizontal surface so as to provide a perfectly level bearing for the faced ends of the vertical reinforcement.

The bases vary in dimensions, but, for the purpose of description, we will take a base such as was used for columns Nos. 9 to 13 and Nos. 17 to 21. This, as illustrated in Fig. 18, consists of a base-plate measuring 4 ft. 6½ in. square by 3 in. thick at the bottom, from which sixteen ribs—twelve 1¼-in. thick and four ½-in. thick—rise to the eight projecting bosses, four 4-in. diam. and four 3½-in. diam. at the upper part of the base, these ribs being strengthened by horizontal ribs about 1¼-in. square cast on the outer sides of the base and the other forming a square in an intermediate position. Four ½-in. holes are cast in the bottom plate to facilitate fixing. The spaces between the vertical ribs of the bases were purposely left open so that they might be filled up with concrete when the columns were moulded.

Another base as used for columns Nos. 14 and 15 is illustrated in Fig. 19. The general construction is very similar to that above described, but there are only fourteen outer vertical ribs and four bosses for the vertical reinforcement of the columns.

Reference has already been made to the old foundations of the building and to the nature of the work involved in the formation of the new footings. We may now add that, after the site had been cleared, the walls of the adjoining premises were shored and in some places underpinned with rubble masonry

wedged underneath the old walls and thoroughly grouted. The next step was to excavate for the foundations of the new walls and columns and to lay the footings upon a carefully-levelled surface. In setting out the positions of the various columns, the centres were indicated at ground floor level by marks on a line near the building line. These marks were laid off by the aid of a transit instrument, and corresponding marks were placed on a line near the top of the adjoining buildings, so that the points could be again laid off in case of interference with the first series of marks. The footings, as described, were then moulded, and after the column and wall forms had been erected the excavations were filled behind and rammed to a depth of 5 ft. above the foundation level.

Everything was then ready for the commencement of the superstructure, the details of which will be dealt with in our next article.

ROYAL ACADEMY EXHIBITION.

THE receiving days for works for this year's Royal Academy Exhibition are as follows:—

For water-colours, miniatures, black and white drawings, engravings, etchings, architectural drawings, and all other works under glass, *Friday, March 24.*

For oil paintings, *Saturday and Monday, March 25 and 27.*

For sculpture, *Tuesday, March 28.*

The hours for reception are from 7 a.m. to 10 p.m. All works must be delivered at the Burlington Gardens entrance; none will be received at the Piccadilly entrance.

Fifty Years Ago.

A PRIZE FOR ARCHITECTS.—I was once proud of my descent from "the proud Salopians," who formerly preferred their ancient abbey to a new bishopric. Plentiful evidence still remains of their love of architecture: that evidence however, methinks, is in stone, and not in humanity, if the Bridgenorth authorities represent the latter. In your advertisements of last week, the directors of the Bridgenorth Public Buildings, &c., appear desirous of receiving designs, &c., for public buildings, &c., &c. They offer 20l. and 10l. as baits; the first, however, to be disgorged if the (I was going to say) architect shall be hooked in for the erection. You would not credit such liberality if it were not rendered somewhat less profuse by the conclusion, that the particulars may be had for 6s. which, if there should be forty competitors, would eliminate the second premium. Your readers may be obtuse enough to imagine that because both the baits are to be furnished by the gudgeons themselves, therefore the small fry will not bite. Let us, however, watch their expert anglers.—F. R. I. B. A.—*The Builder*, January 20, 1855.

Illustrations.

CHURCH OF THE SACRÉ CŒUR, PARIS.

THIS, it will be at once seen, is not the title on the plates, which is a mistake arising out of a misunderstanding with our Paris correspondent. We had commissioned him to get photographs taken for us of the Armenian church, as the only photographs obtainable were far too small; and those arriving shortly after were assumed to be what we had asked for, the editor having only seen the Armenian church when half finished and surrounded by scaffolding; and both buildings are in the modern French-Byzantine style. The mistake was not discovered till after the plates were printed.

However, the name does no harm to the illustrations, which are photographs showing the present external aspect of the church on Montmartre. This is the first view we have been able to give of the finished cupolas from the actual work. A good deal yet remains to be done, especially internally, but the church seems at last to be approaching exterior completion.

BROMLEY MUNICIPAL BUILDINGS.

We give this week the perspective view and plans of the design by Mr. H. V. Ashley and Mr. Winton Newman, which obtained the second

premium in the competition for the new municipal buildings for Bromley.

The following extracts from the architects' draft Report serve to explain their intention in the design:—

"The keynote to the planning of the municipal buildings is the council chamber, which has been placed in the centre of the main facade, and on the first floor; it is a lofty apartment with an octagonal roof with circular windows cutting in on each side of the octagon; the windows being kept high up to prevent annoyance from the sound of traffic, etc. The council chamber is approached from the entrance-hall by a double staircase on the landing of which a lobby for hats and coats has been provided.

The plans clearly show the disposition of the various departments, with their special entrances as required by the conditions. The town clerk's department on the first floor to the north, with the council's suite to the south; on the ground floor, to the left of the main entrance, are the sanitary and accountant's departments; to the right the borough engineer and education departments.

Materials and Construction.—The floors throughout would be of fire-resisting materials, the walls of brick, with Portland stone dressings, and as shown in the elevation to Tready-road. Timber-framed roof, covered with boarding and green roofing slates, and the dome covered with copper sheeting; the flat roof front part of council and education department finished with asphalt on a concrete base, which would form the floor of the future extension. The flooring of entrance-hall would be of marble slabs, the corridors of terrazzo paving, with borders, and the flooring of the offices generally of pitch-pine blocks; of council chamber and committee-room suite, of oak boarding, in narrow widths. The main staircase would be constructed of stone with stone balustrade, etc. The joinery throughout of Columbian pine, finished with a matt varnish, exception being taken to the council chamber and suite, which would be of oak. The ceilings of council chamber and committee-rooms would be finished in modelled plaster.

Warming and Ventilation.—The municipal and education departments have been provided with open fireplaces for heating the offices, and for ventilation it is proposed to carry up a separate ventilation flue, in the chimney stacks, from each of the offices. In consultation with a heating engineer, two small heating chambers have been provided, the one for the council chamber, municipal corridors, and additional heating in some of the larger rooms; the other for the police-court and court buildings generally. Double radiators are suggested, with fresh air brought in from behind, and taken through them. To prevent down draughts in the council chamber it is proposed to run a hot-water pipe round the base of the octagonal dome. With reference to the ventilation of the council chamber and court, it is proposed to have a fan, electrically driven, in each of these rooms.

OBITUARY.

MR. W. GOLDSWORTH.—The death has just occurred of Mr. W. Goldsworth, surveyor, of Yew Tree House, Prescott, at the age of 61. Mr. Goldsworth came originally from Perth. He served his articles with the firm of Mr. John McConnell, County Surveyor of Edinburgh, and with Mr. M. Adam, the originator of Macadam roads. In 1857 Mr. Goldsworth was appointed the resident surveyor to the Liverpool, Prescott, Ashton, and Warrington Turnpike Trust, and afterwards became Surveyor to the Prescott Highway Board, a position he held from 1855 until his death. He was elected by the Local Government Act of 1854, a year in which he was appointed surveyor by the Whiston Rural Council, and he was consulting surveyor to that authority until his death. He had also held many other important appointments. He was Surveyor of the Ashton-in-Makerfield Highway Board from 1855 to 1872, Surveyor to the Prescott Local Board from 1868 to 1896, Surveyor to the Billinge Local Board from 1874 to 1886, in addition to carrying out a large amount of private work.—*Liverpool Courier*.

MR. G. H. STANGER.—Mr. George Hans Stanger, civil engineer, architect, and surveyor, died on Sunday last at his residence, Meridale-grove, Wolverhampton, at the age of 57 years. Mr. Stanger was a native of Nottingham, but had practised in Wolverhampton for over twenty years. During that time he was professionally connected with many public works and schemes. He was the architect for the Union Cottage Homes at Walsford, an extension of the Burntwood Asylum, and works for the Electrical Construction Company, at Bushbury. The deceased gentleman was a member of the Royal Institute of British Architects and the Institution of Civil Engineers.

UNIVERSITY COLLEGE, LONDON.—At the Session of Council this week the plans for the new medical school and nurses' home, which the Council are enabled to build by the donation of Sir Donald Currie, were finally approved. The architect is Mr. Paul Waterhouse. The report of Sir Aston Webb, the arbitrator in the limited competition that has been held for the plans of the new buildings of University College School at Hampstead, was read, and, in accordance with the arbitrator's recommendation, the Council selected the plans of Mr. Arnold Mitchell, and appointed him architect for the buildings.

BOOKS RECEIVED.

MEMORIALS OF EDWARD BURNES-JONES. By G. B. J. (Macmillan & Co.)

MEDIEVAL ART: FROM THE PEACE OF THE CHURCH TO THE EVE OF THE RENAISSANCE. By W. R. Lethaby. (Duckworth & Co.)

POPULAR HANDBOOK OF HOUSE-PAINTING. By Herbert Arnold. (John Heywood, Manchester.)

OLD COTTAGES AND FARM HOUSES IN THE COTSWOLD DISTRICT. By E. Guy Dawber. (B. T. Batsford. 21s.)

THE PRINCIPLES OF PLANNING. By Percy L. Marks. Second Edition. (B. T. Batsford. 8s. 6d.)

A HISTORY OF ARCHITECTURE ON THE COMPARATIVE METHOD. By the late Professor Fletcher and Banister F. Fletcher. Fifth Edition. (B. T. Batsford. 21s.)

THE PLENUM OR PROPULSION SYSTEM OF HEATING AND VENTILATION. By Harold Griffiths. (Simpkin, Marshall, & Co. 4s. 6d.)

Correspondence.

FIFTY YEARS OF ARCHITECTURE.

SIR,—In this age of hustling it is decidedly advantageous to take a retrospect whenever possible, look up what ideals we set before us, and consider how far they were realisable, and note how far attained.

Therefore I was pleased to see the extract given in your issue of the 14th inst. from E. L. Tarbuck's communication of fifty years ago. It sets us thinking, have we succeeded in getting the "indigenous style" we are therein told to seek? How far do our buildings "rise at once out of the peculiar circumstances of modern days?" and how far do they appear "the works of Britons of the XIXth century"? Do we really desire a "destroyer of the old method?" Is it possible to originate a new method, or is it, as Sir Aston Webb suggests, a "will-o'-the-wisp"? Personally, I disagree with the author's view that the fault is that of the public, as regards what he calls "the disgrace of copyism."

Apathy and want of taste we may admit, but the public has generally taken resignedly whatever style the architect had adopted or that happened to be in vogue at the time of his engagement.

We may see this in walking along some of the "new" thoroughfares laid out by the M.B.W. or the L.C.C. We have rung the changes from modern Italian and Gothic to Queen Anne, Flemish Renaissance, simple Georgian, free classic, etc., in civil and civic buildings. In churches we have two types, some designers adhering to precedent, others using a late and more or less debased travesty of Gothic with scrolls and balusters for tracery and millions.

In rural buildings, a picturesque effect has been achieved by a heterogeneous admixture as if of several epochs in their component parts.

But in what rare instances in civil, ecclesiastical, or domestic modern architecture does the element of repose come in. Even in the popular restaurant and public-house fittings, a fussy fidgetiness of detail and ornament leaves no restful point for the eye. Copyism, which our author complained of fifty years ago, is not responsible for this state of architecture to-day. It was imitation of ancient examples which he had in mind. They were free from meretricious ornament; now it is copyism of an individual designer or a school, wide or which has originated (?) a reversion to some specially ornate, or it may be specially bare and ugly style of building, multiplying its features *ultra viam*, and creating a vogue because they had a large and influential clientele. Supposing that we really feel with our author that "a destroyer of the old scholasticism or an originator of a new method (style?)" was the greatest need for architecture, can we truly say that he has been among us without our knowing it, and worked out by our instrumentality a style which we can say and which posterity can recognise is "the work of Britons of the XIXth century, and not likely to be mistaken as the composition of Egyptians, Turks, Middle Age architects, or Moors in the last stage of their dotage"? In a matter like this one is forced to generalise. It is, however, only fair to admit that some of these leaders, who are obtaining a following from among our young architects, have infused a certain amount of individuality into their own work based upon bygone styles, and where

restraint has been exercised one is bound to admit their attractiveness. Restlessness and striving after a pseudo quaintness is too often evident. Professor Aitchison truly says:—

"My opinion is that any tendency this age may have to structural beauty inclines towards elegant simplicity and an almost total absence of ornament."

Twenty years ago, when these phases were possessed of the charm of novelty, and were, as to detail, held in greater check, we had a very complimentary appreciation in M. Paul Sedille's work, *L'Architecture Moderne en Angleterre*. Your own work, *Modern Architecture*, carries helpful criticism to a later date, but goes beyond these shores; and I think it is equally beneficial to learn how our work strikes a foreigner. It would be interesting to know if one of like impartiality saw signs of decadence in our work since M. Sedille wrote his book, and if we have remedied in any degree the fault he found—viz., that our public buildings did not express in their design the purpose of their creation.

It is said that there is too much talking about art, and also that Britons are apt to decry and belittle their own performances and achievements. It is anyhow a failing which leans to virtue's side, and it ought to lead to progress if it exists in regard to architecture. We are not bound, on the other hand, to be always proclaiming that we cannot ever come up to the men of old time, and that all they did was perfect.

I humbly join issue with the author, and say that, leaving "fairness" out of the question, I believe we must "look to the profession for a remedy of the evils stated," granting that they are evils, and that it is possible to remedy them.

It will be a useful feature, I venture to think, if you give us an occasional echo of the sound of some voice that is still.

E. W. HUDSON.

ARCHITECTS' DRAWINGS.

SIR,—With reference to the subject of the ownership of drawings and documents, will not the matter be straightened out and settled once and for all if the Institute's memorandum of architects' charges merely specifies, with other matters already specified, that the charges stated therein do not cover the supply of drawings and documents to the employer?

There are obvious objections to the architect asking a dispensation of his employer on the issue, but there is no awkwardness in the architect sending his employer a copy of the memorandum (with what modifications he desires) as a basis upon which his charges will be made.

A clause in the specification, as suggested by one of your correspondents, is useless, as between the employer and the architect, because the architect is not a party to the contract at all.

H. BULKELEY CRESWELL.

*We understand that the Institute are contemplating a revision of the wording of their scale of charges at the earliest opportunity. There is no doubt that the wording of the paragraph, as it now stands, is most unfortunate, and appears to outsiders to mean what it was never intended to mean.—ED.

SPRING-GARDENS, CHARING CROSS, AND WHITEHALL.

SIR,—As no doubt your interesting paper in the New Year's issue will be cited as an authority, may I venture to indicate some slight inaccuracies in regard to Whitehall Yard and Gardens. Lord Gage's house, No. 4, Whitehall-yard, has not been demolished, as stated on pp. 10 and 11. It was built about 1796-7 for Michael Angelo Taylor, later inhabited by Viscount Gage and Sir John Puleston, and has been the Bankruptcy Department of the Board of Trade since 1886. It is known as 1, Horse Guards-avenue. The range of buildings facing the new War Office comprise No. 1, Whitehall-yard (Lady Catherine Pelham's, 1702-?) 1809; No. 2, entrance door not used, but approached from Whitehall-gardens, as No. 8; No. 3, originally (1773) Hon. Charles Sloane Cadogan's, original entrance still used, but unnumbered in 7, Whitehall-gardens.

Whitehall-gardens, No. 6, was not the site of the Duke of Portland's house, but the house of Gibbon's friend, Lord Sheffield, from whom it passed to Sir John Thomas Stanley, Bart., who rebuilt the house about 1803.

No. 3 (once Lord Cardwell's) was recently pulled down, and a new wing to No. 4 added. The site of the Duke of Portland's house was sold to the Right Hon. (afterwards Sir Robert)

Peel in 1824, who sold the materials of the old house and handed to the Crown the proceeds, 7500., and erected thereon No. 4, now portion of the Crown Agents for the Colonies Office.

No. 8, Whitehall-gardens is now merged in No. 7, but the original entrance exists. It was probably built for the Harris family in 1722, as a cast lead cistern bearing that date is in the basement with initials J. B.

A letter is extant, dated November 10, 1763, in which Mrs. Harris tells her son, the future Earl of Malmesbury, that "Mrs. Grenville and her four children were here, but the weather was so dreadfully bad and dark that the whole beauty of the [Lord Mayor's] Show on the river was lost, it was a great disappointment to us for 'tis the only sight we have, in the whole year from these windows." Pembroke House has not been enlarged on the south side, but its north-east front appears to have been modernised. Perhaps its north wing did not exist in Mrs. Harris' day, hence she got her river view.

ROBERT J. LISTER.

62, Melody-road, Wandsworth Common.

*By the courtesy of the Editor of the *Builder*, I am enabled to reply to Mr. Lister's letter. When I went over the ground with the late Mr. Arthur Cates—and all will allow one could have no better guide—he showed me Lord Gage's house; his own survey (which is at Mr. Lister's service), and the *Builder* of December 5, 1885, corroborate my recollection of the houses since pulled down. The present No. 1, Horse Guards-avenue, was, I gather, Sir John Puleston's. The old views show the Dowager Duchess of Portland's as next, south, to Pembroke (Harrington) House, and in the Privy Gardens—confer also Dr. Sheppard's "Royal Palace of Whitehall," 1892, and his list of official and other authorities. Since No. 7, Whitehall-gardens embraces Malmesbury House, I did not speak of that house as being No. 8; and that postal number belonged, it seems, to the block standing east and west between the gardens and what was Whitehall-yard. If Mr. Lister is assured that no addition has been made to Pembroke House I will not contest here his statement, though it does not agree with my own information; I would, however, direct his attention to Colin Campbell's drawings and to the drawing which Crowle lent to J. T. Smith, who reproduced it in his "Westminster." The drawings combine to show that at one time a view (since obstructed) of the river could probably be obtained on its south side from Malmesbury House.—THE WRITER OF THE ARTICLE.

GENERAL BUILDING NEWS.

CHURCH, ROCHDALE.—The new church of the Good Shepherd, at Rochdale, is to be opened shortly. The length of the nave is 60 ft., and the width 48 ft. There is a temporary chancel 12 ft. long by 22 ft. wide, and the height of the nave and aisles is 37 ft. A triple arcade separates the nave from the aisles, the clearstory above being 30 ft. from the floor. The floor is formed of wood blocks arranged in patterns. At the west end is a seven-light window, and this and the other windows of the church are filled with painted and bordered cathedral glass. The church will accommodate 450 worshippers. The design was prepared by Mr. E. H. Lingen Barker, of Hereford and London.

CHURCH, FIR VALE, SHEFFIELD.—The newest ecclesiastical parish in Sheffield is that of St. Cuthbert's, Fir Vale, and a new church has just been completed on a site off the Barnsley-road. In July, 1901, the foundation-stone was laid of the chancel and the transepts, which were consecrated just a year later, and last July the foundation-stone of the extended nave was laid. The first portion of the building cost 5,600., and the total cost is 9,000. The architects were Messrs. J. D. Webster & J. Douglas Webster, of Sheffield. The church, which is built to accommodate 750 people, consists of a nave, 92 ft. long and 30 ft. wide, with north and south aisles, a north and south transept, and a chancel, 36 ft. by 29 ft. The nave has an arcade of five bays, and at the north-west angle provision is made for a tower and spire, reaching to a contemplated height of 150 ft. The flooring is terrazo, and the sittings will be chairs, instead of benches. There are vestries for choir and clergy, and an organ chamber has been provided, to receive eventually an organ. The height of the nave to the square is 33 ft., and to the apex of the roof 50 ft. Bath stone comprises the interior stonework, and the material for the exterior is Crookes wall stone and Matlock ashlar.

RESTORATION OF HOLY TRINITY CHURCH, YORK.—One of the most ancient churches in

York, Holy Trinity, Micklegate, which has recently been restored, was reopened on the 11th inst. The work of restoration, which has cost over 5,000*l.*, was planned by Mr. C. Hodgson Fowler, of Durham. For years a brick wall at the west end has cut off a large part of the building, and within the area formerly used for Divine worship there has existed a slaughter-house and hay-loft. Old doors have been repaired, decayed ones replaced, and new carvings introduced, including representations of the King, the Archbishop of York, and the Dean of York. In addition to the restoration there are two new windows, the chief being at the west end. The three lancets are filled with stained glass. The centre light contains representations of St. Martin and St. Benedict; in the south lancet is St. Thomas of Canterbury; and in the north St. James the Apostle.—*Yorkshire Daily Observer.*

TOWER, ST. ANDREW'S CHURCH, DENTON.—The Bishop of Lincoln conducted a dedication service at St. Andrew's Church, Denton, near Grantham, on the 12th inst., on the reopening, after restoration, of the tower. The tower was built between 1350 and 1400. For several years its condition had caused much anxiety, and such precautions had to be taken for its safety as shoring up the tower portion and ceasing to ring the bells. The principal cause of anxiety was the apparent widening of several large cracks of old standing, which penetrated through the thickness of the walls. Under the personal supervision of Mr. Wm. Weir, architect, the work of repairing and strengthening the tower was completed last May. A broad belt of solid brickwork has been built in the interior, the exterior has been repointed, the vane and pinnacles renewed, a lightning conductor placed in position, and the clock regilded. The cost of the renovation has been about 900*l.*

SCHOOL, SANDEND, N.B.—A new school was recently opened at Sandend. The building consists of two rooms, each capable of holding about sixty pupils. The architects were Messrs. Sutherland & Jamieson, Elgin; and the contractors—Messrs. M. Gray; carpenter, Mr. Macdonald; plasterer, Mr. Rae; slater, Mr. Strathdee; painter, Mr. Macdonald; plumber, Mr. Grant, all of Portsoy.

SOLDIERS' HOMES, BORDON CAMP, HANTS.—At Bordon Camp, on the 13th inst., Lord Donoughmore opened, a new Wesleyan Soldiers' Home, which has been built there at a cost of about 2,500*l.* The architects were Messrs. Gordon & Ganton, Blomfield-street, E.C.

COUNCIL SCHOOLS, SUNDERLAND.—New provided schools in Commercial-road, Sunderland, to be known as the Commercial-road Juniors' and Infants' Schools, were opened on the 9th inst. The site cost 1,150*l.* the buildings 8,460*l.*, and the furniture 460*l.* Messrs. J. Fox & Son were the architects, and Mr. R. J. F. Carter clerk of works.

SCHOOLS, TIPTON.—The opening of new schools in Park-lane, Tipton, which have been provided at a total cost of near 14,000*l.*, including the purchase of the site, took place on the 9th inst. The buildings are in two styles. The elevations are faced with pressed bricks, relieved with terra-cotta dressings, and the roofs are covered with dark red tiles. The infants' department, which is placed in the centre of the block, has a main room, 65 ft. long by 22 ft. wide, and three classrooms, one of which is designed and equipped for babies. The main room is divided into two by a movable, half-glass partition. In connexion with the infants' department is a hall, 32 ft. by 16 ft., for the marching and drilling of the scholars. The boys' and girls' departments each consists of a main room, 35 ft. by 23 ft., and three classrooms, the lengths of which range from 25 ft. to 31 ft. Each of these main rooms is divided into three compartments by half-glass, movable partitions. A corridor gives access to all rooms, and provides accommodation for drilling under cover when necessary. All classrooms and each section of the main room are arranged to open into the corridor. Separate cloakrooms, lavatories, and teachers' rooms are provided for each of the three departments. Detached from the main block of schools is a building arranged as a cookery centre, providing accommodation for fifty-six children at demonstration. The schools provide accommodation for 355 boys, 355 girls, and 330 infants, making a total of 1,040, exclusive of the cookery centre. The buildings have been erected by Mr. Thomas Hardy, West Bromwich, under the direction of the Architect to the Education Committee, Mr. Alfred Long, West Bromwich.

PRESBYTERIAN CHURCH HALL, FELIXSTOWE.—A church hall has been erected at the rear of the Presbyterian church at Felixstowe. The hall is approached from the church by the side of the

entrance to the vestry, and is 26 ft. square, with a temporary end, so as to allow of future extensions. At the opposite end is a platform, surmounted by an arch. The height of the building is 21 ft. to the ceiling, and the style is Gothic. The walls are plastered, with a matchboard dado, and the roof is covered with red tiles. The hall will seat about 120 persons. The architects were Messrs. Eade & Johns, of Ipswich, and the contractor Mr. Harry J. Linzell, builder, of Ipswich and Felixstowe.

PAROCHIAL HALL, DUNDURM, IRELAND.—A new parochial hall was recently opened in Dundrum, County Down. Mr. John Russell, C.E., Belfast, was the architect, and Mr. Patrick M'Aleenan, Castlewellsan, the contractor for the building, which is capable of seating 400 persons, comprising the main hall and platform, and committee-room.

NEW HOTEL, DARLINGTON.—The Greyhound Hotel, Darlington, recently completed from the designs of Mr. W. Hargreaves Bourne, Darlington, is faced with Huncote plastic bricks. A portion of the building has been reserved for two shops, one with dwelling-house over, and forming part of the general design. Great difficulty was experienced in the foundations (cellars being built under the whole of the main building), owing chiefly to the rising of the adjoining river, the fact that the town sewers are above the first level, and the nature of the sub-soil. The scheme adopted was the use of Callender's damp sheeting laid vertically on walls and horizontally over the whole basement. The hotel comprises, on the ground floor, bar and two smoking-rooms. On the first floor, dining-room, kitchen, scullery, pantry, store, etc.; and on the second floor, bedrooms, bath-room, store, etc. The whole of the ground floor is of steel and concrete construction, the upper floors being of wooden joists and pugging. The floors of bar, entrance lobby, and corridor are covered with Doulton's 4-in. red tiles, laid diagonally, those of smoking-rooms with pitch-pine wood blocks, stained and varnished. The woodwork to bar is of polished Spanish mahogany. The entrance lobby is tiled out with green tiling by Messrs. Doulton & Co. Messrs. Bostwick & Co. supplied the collapsible gate; Messrs. William Morris & Co. (London) the leaded lights and embossed glass. The contractors were:—Bricklayer and plasterer, Messrs. McKenzie; carpenter and joiner, Mr. B. T. Snaith; slater, Mr. J. Wandless; plumber and glazier, Mr. Emerson Smith; painter, Messrs. W. H. & W. Hoskins (all of Darlington). Messrs. W. E. Dove & Co. (Darlington) executed the electric light; Messrs. Henry Walker & Son (Newcastle-on-Tyne) supplied the fire-grates; Messrs. J. C. Edwards (Ruabon) the terra-cotta; Messrs. N. E. Spittle (Birmingham) the hanging sign; and Messrs. Dorman, Long, & Co. the girders, etc. The cost of the building works out at 8*l.* per foot cube.

ISOLATION HOSPITAL, ACTON.—The Urban District Council having purchased "The Friars" and 12 acres of land belonging to the same set apart the old mansion and 4 acres of land for the purposes of an isolation hospital. They have converted the house into a large administrative block—much larger than is required at present; but as the hospital pavilions are added to the whole of the accommodation will be gradually taken up. At present the Council have provided two fever pavilions, each with fourteen beds, and the necessary sanitary fittings, bath-rooms, nurses' room, etc. They have also provided an observation block, with two wards of two beds each, and one ward with one bed, and the necessary sanitary fittings, nurses' room, etc. The remaining block contains the steam laundry, disinfectant, mortuary, and coach-houses for the horsed ambulance, and the horsed vans which convey goods to and from the disinfectant. There will be room for other pavilions as they may be required, and it is estimated that when the whole of the district is built over, at least 125 beds will be required in the hospital, which is provided for small-pox—other provisions being made for cases of that kind. In the grounds are high-pressure water mains with hydrants for the protection of the buildings from fire, and the grounds and the buildings will be electrified by the Council's distributing machinery in the laundry also being worked by an electric motor. The total cost of the work, which has been carried out according to Council's Surveyor, Mr. D. J. Ebbetts, will be over 15,000*l.*

MASONIC HALL, BELFAST.—The McCallum Memorial Masonic Hall, Holywood, which was opened a short time ago, stands on a site adjoining the town hall, having a frontage to Sullivan-place of 50 ft., with a depth of 60 ft. The building has been erected by Messrs. J. & R. Thompson, from

the plans and under the superintendence of Mr. Godfrey W. Ferguson. It is built of red brick and white stone, and is set back from the footway and protected by an iron railing. The heating is effected by Messrs. Mungrave's system, and the ventilating is by cold air, admitted at intervals below the pipes and controlled by regulating valves. The extraction is by two of Boyle's ventilators in the roof. The artificial lighting is by two arc incandescent lamps, each of 100 candle-power, fitted up by Mr. John Clements, who had charge of all the plumbing and gas fitting.

RESTAURANT, LIVERPOOL.—A new restaurant has been opened in Dule-street, Liverpool. The work has been carried out from plans prepared by Mr. W. Aubrey Thomas, architect.

SANITARY AND ENGINEERING NEWS.

SALFORD NEW DOCK.—A recent paper, presented by Mr. H. L. Hunter at a meeting of the Manchester University Engineering Society, contained a full description of a new dock in connexion with the Manchester Ship Canal. One interesting feature in this work is that the dock walls consist of a series of arches, with earth inside them sloping from back to front, and pitched with limestone rubble. Another noteworthy detail is a sub-way extending along each side of the dock, and used for the accommodation of drain pipes, hydraulic mains, and cables for electric light and power. A second subway is provided below one side of the dock and halfway along the other side. This is furnished with a belt conveyor, which is available for transporting grain from vessels to the grain elevator at the end of the dock. The arrangement permits the introduction of a great improvement upon the ordinary system, under which ordinary cargo is first unloaded, and the ship has then to be moved to a position opposite the grain elevator. It is worthy of note that all the transit sheds, extending along one side of the dock, are of concrete-steel.

SHIPLEY SEWAGE WORKS.—Extensions at the Shipley sewage works, carried out by the District Council at an estimated cost of 14,000*l.*, in order to meet the requirements of the Local Government Board, were opened on the 13th inst. The engineer was Mr. Malcolm Paterson.

ROYAL COMMISSION ON SEWAGE DISPOSAL.—At the meeting of the Dorking Urban District Council recently, the Roads Committee reported that at their last meeting a letter was read from the secretary to the Royal Commission on Sewage Disposal, asking the Council to consent to the Commissioners conducting a series of special experiments at the Dorking outfall works for the purpose of determining the relative value of different methods of treating domestic sewage. For this purpose the Commission would only propose to take a small portion of the sewage which would be dealt with in experimental tanks and filters on the side land, and the present arrangements for dealing with the sewage would not be interfered with. The investigations would possibly extend over a period of twelve to eighteen months, but would probably not be undertaken unless the alterations proposed by the Council at the outfall works were deferred. The committee recommended that, having regard to the special value of the experiments in relating to Dorking sewage treatment, the Council accede to the application and defer the carrying out of any alterations at the outfall works until the series of experiments referred to were completed. As arising out of the above, it was suggested that Mr. Strachan be informed of the proposed postponement of the alterations at the outfall works and requested in the circumstances to furnish without further delay the necessary plans, estimate, etc., to enable the Council to proceed with the application to borrow for the purpose of drainage works in Pichman-lane.—The committee's recommendations were adopted by the Council.

FERRO-CONCRETE PILING.—Messrs. Niven & Wigglesworth, who are the architects for the new Dundee Courier offices at Dundee, send us a copy of that journal containing an account of the operation of using concrete piling in the foundation of the building, which is no doubt furnished by an expert on the subject, and part of which is worth quoting, in consideration of the interest now felt in ferro-concrete. "To make the pile, a square framework is constructed of steel rods, each 1½ in. in diameter. To one end of this framework a sharp-pointed shoe or shoe is attached, similar to what is used in wooden piles. This skeleton is laced throughout with links of round steel, and is lifted into a long box or trough, which is 3 in. larger each way

than is the steel skeleton. Here it is tightly packed with a mixture of crushed stone, sand, and cement, the material being very firmly driven in with rammers. When the cement has set, the sides of the box are taken down, disclosing what looks like an immense pencil 28 ft. long, 14 in. on the sides, and weighing over two tons. The work of driving was performed at first by a single steam pile-driver, but later a second engine was brought into requisition. The principle that governs its operations is the same as the steam engine, only the action is reversed. In the steam engine when steam is admitted to the cylinder the piston is driven out, but in the pile-driver the piston remains fixed, and the cylinder is forced upwards by the expansion of the steam. At the height of the stroke a valve is opened, the steam escapes to the air, and the cylinder drops down on the top of the pile. The machine is, in fact, a steam-hammer, and it falls with a weight of two tons on the top of the pile, the blows being delivered at the rate of thirty per minute. To prevent this blow from smashing the concrete, the pile is crowned with what is styled a "helmet," made of cast-iron, and in this is fitted a block, or "dolly," of solid elm, which softens the hardness of the impact. A pulley on the top of the derrick enables it to be transformed into a crane for lifting the pile into position. The piles are grouped together at the points where the weight of the building will be received. They are mostly placed in groups of five, sometimes in four or three, and the first pile of a set generally drives to nearly its entire length. But as the soil becomes consolidated the friction gets stronger, and the last of the five never drives to full depth. All are, however, finished off by the ground level. The concrete is chipped through, and the steel rods in the interior are shown across about 1 ft. above ground. Transverse rods are then laid from one pile head to the next, and these are in turn sheathed in concrete, so that in effect all the piles are laced together by massive beams of stone and steel. Upon these a floor of reinforced concrete, 7 in. thick, is laid, so that the last result is a gigantic raft with huge prongs gripping the soil beneath.

FOREIGN.

FRANCE.—Mr. Tony Robert-Fleury has been re-elected President, for 1905, of the Société des Artistes Français (old Salon).—The second exhibition of photographic documents of Old Paris has been opened at the Petit Palais. It includes about 1,300 views of Old Montmartre, of the Bièvre river (within the walls of Paris), of various private gardens. It is proposed to place the monument to Alfred de Musset, at first intended for the Place du Théâtre Français, on a site in the Champs Élysées, near the Petit Palais.—An exhibition of the works and sketch models of Dalou is shortly to be organised.—The Government has purchased, at a cost of 200,000 francs, the chateau of Maisons-Laffitte, built from the designs of Mansart. It is to be made an annexe to the National Museums.—An interesting exhibition of the works of the painter Emil Fuchs is on view at the Georges Petit Gallery. Besides some very clever pictures, there is represented the heads of Queen Victoria and other members of the royal family of England.—A new consumption hospital is to be built at Nancy, at an estimated cost of 250,000 francs.—M. Raoul Verlet, the Council Supérieur of the Ecole des Beaux-Arts, in place of M. Tony Noël, who has been appointed a professor in the École.—M. Marquette (sculptor) and M. Bernier (architect) have been appointed to represent the Académie des Beaux-Arts at the Archaeological Congress to be held at Athens in April.—The death is announced of M. Barth, architect, who was an Inspecteur des Bâtiments Civils.

ATHENS.—Several projects are now being studied by the Municipality of Athens for the improvement of the streets in that city which, at present, are in an unsatisfactory condition. One of the projects provides for the laying down of three kinds of paving in different parts of the city: macadam tarred on the surface, asphalt, and granite. About 2000,000 sq. mètres would be macadamised, 74,000 sq. mètres asphalted, and 10,000 sq. mètres paved with granite. The total cost of the work is estimated at about 10,000,000, and the work is estimated to take ten years at about 2,400 per annum; after that period the annual upkeep is estimated at about 4,400. The details of the project will shortly be discussed by the Municipal

Council. In order to begin work in 1905, the provision has been made in the Municipal Budget for the expenditure of about 5,000.

GUATEMALA.—Mr. Melville, the British Commercial Agent here, reports that there is great activity in building, as many houses that suffered during the earthquakes of 1902 are being pulled down and rebuilt, and the new ones are nearly all provided with the latest sanitary appliances, so far as they are known to the local builders.

ARCHAEOLOGICAL CONGRESS AT ATHENS.—The International Archaeological Congress will be held at Athens on April 7-14, and will be succeeded by a tour in the mainland, Ephesus, Crete, Samos, and the Islands of the Aegean. M. Carapanos, the Minister of Public Instruction, will open the congress with an address to the members in the Parthenon, and accounts of the progress of research in Greece will be given by the Director of Greek Antiquities and the directors of the foreign schools. The seven sections consist of classical archaeology; prehistoric and Oriental archaeology; excavations, museums, and preservation of monuments; numismatics and epigraphy; Byzantine archaeology; geography and topography; and instruction in archaeology. For general purposes the congress will be held in the French language.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.

The partnership between Messrs. Jesse Hayward and Edgar W. Wooster, building contractors, Walcot-street, Bath, under the title of Hayward & Wooster, is, by mutual consent, dissolved as from January 1, 1905. Mr. Hayward retires, and his son, Mr. Geo. Hayward, joins Mr. Wooster as junior partner, by whom the business will in future be continued under the old style of Hayward & Wooster.

THE BUILDING TRADES EXHIBITION.—The Building Trades Exhibition will open on April 27 this year and close on May 6. Almost all the 1903 exhibitors will be represented, and they will be reinforced by some sixty leading firms who have never before exhibited. Several novelties are promised, particularly in fire-prevention partitions and floors. Over 250 exhibitors have already taken space, and the whole of the ground floor has been appropriated. Lord Windsor (First Commissioner of Works) will preside at the opening ceremony.

PROPOSED NEW ELECTRICITY STATION, TORQUAY.—At Torquay, on the 4th inst., Mr. H. Ross Hooper, C.E., held an inquiry respecting the application of the Town Council for sanction to borrow £2,000 for providing a new electric lighting, power, and supply station, and for approval of the appropriation for the purpose of land in Lymington-road, Upton Valley, adjoining the site of the refuse destructor. The Town Clerk (Mr. F. S. Hex) explained that, owing to want of room, it was not possible to meet the increased demand at the present station, and a site for the new station had been found on land belonging to the Corporation in Lymington-road. The Corporation had entered into an agreement to supply the Dolter Electric Traction Company with current from the station for the working of the trams which they were about to provide. A tender for the erection of the chimney, at a cost of 3,719, had been provisionally accepted from the Alphons Custodis Chimney Construction Company. Mr. H. A. Garrett, Borough Surveyor, stated that the new chimney—which is to be utilised for both electric lighting and refuse destructor purposes—would be 250 ft. high, and explained the plans in detail; Mr. Otto Heinrich, C.E., representing the Alphons Custodis Company, described the chimney they have contracted to erect; and Mr. P. Storey, electrical engineer, gave evidence as to the plant in the existing electric lighting station on Beacon Quay, and its transfer to the new station. The inquiry was adjourned.

LONDON BUILDING ACT (AMENDMENT) BILL.—On Saturday the Works Committee of Kensington Borough Council reported having received a letter from the London County Council, forwarding copy of the London Building Act (Amendment) Bill proposed to be introduced in the next session of Parliament. The measure, in the opinion of the Committee, is a most important one, vitally affecting the interests of the metropolis, the suburbs thereof, and its local government. It appeared to them, therefore, to be most desirable that some joint action should be taken in the matter by the whole of the borough councils. Accordingly the Committee had passed the following motions:—

(a) That a communication be addressed to the Corporation of the City of London, the Council of

the City of Westminster, and the Metropolitan Borough Councils, inviting them to appoint delegates to attend a conference to consider what joint action should be taken in regard to the Bill. (b) That four delegates be appointed to represent Kensington at the proposed conference.

MEMORIAL TO LORD RUSSELL OF KILLowEN.—The memorial to Lord Russell of Killowen was unveiled on the 11th inst. in the Central Hall of the Law Courts by the Lord Chancellor, Lord Russell, in the statue by Mr. Thomas Brock, R.A., which is placed below the gallery on the left as one looks along the hall, is seated and robed in the full dress of a judge.

BACK-TO-BACK HOUSES.—The monthly meeting of the Keighley Town Council was held on the 10th inst., when plans for 136 houses in Bronte-street and Beeches Estate were recommended for approval by the Buildings and Streets Committee; but objections were raised by several members of the Council on the ground that the houses would be back-to-back houses, though it was proposed to build them in blocks of four instead of in continuous rows. An amendment to refer the recommendation back until after the Local Government Board inquiry, which is to be held with regard to back-to-back houses, was moved by Mr. Craven. Mr. J. W. Midgley asserted that the people of Keighley wanted back-to-back houses, and the houses it was proposed to put up under this recommendation would compare very favourably with the back-to-back houses sanctioned in Leeds and Bradford. Alderman B. S. Brigg pointed out that in seeking Parliamentary powers thirteen years ago, the Council gave an undertaking not to sanction back-to-back houses in the borough, and they ought not to break their promise without seeking the permission of the Local Government Board.—The plans were eventually approved.

BASTOL MASTER BUILDERS' ASSOCIATION.—In the annual report of this Association it is stated that the year 1904 will undoubtedly long be remembered as a very indifferent one so far as the building trade is concerned, and, indeed, all branches of industry have more or less suffered from depression. To account for this many reasons are attributed, the three principal being the stagnant condition of trade in South Africa in consequence of the late war, the difficulties arising in the matter of Fiscal reform, and the war in the Far East. Through the generosity of the retiring President, Mr. E. I. Neale, the Association possesses a gold medallion, bearing a suitable inscription. The Association subscribed to a chain, each link bearing the name of a past president. In consideration of the time and attention Mr. Church has devoted to the work of this Association through a long period of years, during which he served in the capacity of acting secretary, President, and honorary vice-president, the Association resolved upon recognising his services, and presented him with a silver salver, upon which a suitable inscription was inscribed. During the past year little or no friction has existed between the masters and men. The Home Office forwarded to the Association copies of a memorandum dealing with "premises in which machinery worked by power, temporarily used in the construction of a building, or in the structural work in connexion with buildings and to buildings, over 30 ft. in height, which are being constructed or repaired by means of scaffolding, whether machinery be used or not," which were issued to the members of the Association. The usual annual outing of the Association was promoted in the summer, the venue being Chepstow and Raglan. Numerous other subjects, such as the opening of tenders in the presence of contractors, terms of contracts for several undertakings, priced bills of quantities, taking out of quantities, time limit, and other such general matters, have from time to time occupied the attention of the members of the Association during the year, and it is believed that the Association is stronger numerically, and that its work generally is more highly valued and appreciated than it has ever been in past years.

WELLINGTON MONUMENT, ST. PAUL'S.—For a new barrier around the monument in the nave arcade the cathedral authorities have utilised a portion of Alfred Stevens's work—consisting of the plain railing, having lions seated upon the uprights, which, for some reason or other, was removed a few years ago from the pavement in front of the British Museum, where it served its purpose in respect of both situation and design.

ROYAL EAR HOSPITAL, SOHO.—The new buildings in Dean-street, Soho, have been built after designs by the late Mr. Rogers Field and Mr. A. O. Collard, whose plans include an extensive out-patients' department, an operating theatre, and three wards with twenty beds. The total cost of the site and buildings amounts to 12,000, approximately,

and the children's ward has been furnished and fitted throughout with subscriptions collected by the children of friends of the institution. The hospital was founded as the Royal Dispensary for Diseases of the Ear in 1816, and had its earliest home in a house in Dean-street; at the expiration of the lease it was removed to Fifth-street, where an infirmary department was opened; the governors bought the present freehold site in Dean-street six years ago.

INSTITUTE OF ARCHEOLOGY, LIVERPOOL UNIVERSITY.—It is stated that Sir John Brunner, M.P., has undertaken to enable the committee of the Institute of Archeology to set about the preparation of an illustrated work upon the civilisation and antiquities of Egypt, which they intend shall give a complete history of that country from ancient times to its conquest by Alexander the Great, and include the results of modern exploration and research.

BARNES PARISH CHURCH.—Mr. Charles Innes is appointed to survey the altar space, and enlargement of the church of St. Mary, Barnes, upon which a sum of 5,000*l.* is to be expended. The body of the church is constructed of flint and free-stone; the western tower, with an octagonal turret, was built of red brick, with stone coigns, in or about 1500. In the chancel, which is of the early English period, and was enlarged on the north side in 1838, is a brass bearing the effigy, in armour, of William Millebourne, *obit* 1415; amongst the many memorials is that of Vice-Chancellor Sir Launcelet Shadwell, 1850, who lived in the manor-house, Barr Elm.

A FERRY TO FRANCE.—Adverting to our remarks ("Magazines and Reviews," p. 34 *ante*) upon Mr. Arnodin's scheme for crossing the English Channel by means of a high-level bridge, we may mention that the International Railway Company are promoting a statutory measure for the establishment of a steam ferry (in lieu of a submerged bridge), and have at the same time taken over the plans of the Channel Bridge Railway Company.

A GALLERY OF MODERN ART, DUBLIN.—A committee have opened a subscription list for the purchase of pictures—mostly of the French modern school—to be chosen from the Staats-Farbes and Durand-Ruel collections which are now exhibited at the Royal Hibernian Academy. It is estimated that a sum of about 40,000*l.* would be necessary for the acquisition of all the pictures, which comprise Puvion de Chavannes' "Beheading of John the Baptist," three fine examples of Claude Monet, Manet's "Portrait of Eva Gonzales," and "The Strolling Musician," and numerous paintings and drawings by Corot, Millet, Israels, Mauve, Maris, Courbet, Bastien-Lepage, Fantin-Latour, Whistler, Constable, and others.

THE ALEXANDER THOMSON TRAVELLING STUDENTSHIP.—This studentship, value 60*l.*, to be competed for every third year, is open to architectural students between the ages of 18 and 25 years, residing in the United Kingdom. For this year the trustees offer a prize of 60*l.* for the best set of drawings submitted in accordance with the programme set forth hereafter, also a prize of 20*l.* for the set placed second (should the number of the competitors and the quality of the work submitted be such as to warrant an additional prize being given). The subjects for competition are:—(1) A Study of a Classic Building; if specially prepared for this competition, the subject to be the Monument of Lysicrates; (2) A Design for a Cascade and Portico in a Public Park. The drawings, without motto or distinguishing mark of any kind, are to be directed to Mr. C. J. MacLean, 115, St. Vincent-street, Glasgow, secretary to the Trust, and delivered at his address before 4 p.m., Thursday, December 28, 1905. The successful competitor will, within two years after receiving intimation that his drawings have been placed first in order of merit, be required to go on a sketching tour for a period of three months, in order to pursue his architectural studies. The competitor placed second, should this prize also be awarded, will in like manner be required to spend a period of three weeks in making drawings from the reproductions from classical buildings in the British Museum, London, or elsewhere, as may be arranged to the satisfaction of the trustees. The prizes are to be paid in two equal instalments, the first when the students have made satisfactory arrangements to begin their sketching tour, and the second when they shall, after the stipulated absence, have submitted to the trustees satisfactory evidence of their diligence, in the form of drawings and sketches, with a manuscript memoir descriptive of the work done. Full particulars can be obtained from the secretary, at the address above given.

YORKSHIRE FEDERATION OF BUILDING TRADES' EMPLOYERS. The annual dinner of the Yorkshire Federation of Building Trades' Employers was held at the Midland Hotel, Bradford on the 17th inst. Mr. Angus Moulson (President) occupied the chair, and was supported by the Mayor (Alderman W. E. B. Priestley), Mr. C. H. Gott (President of the Bradford Association of Architects and Surveyors), Mr. James Watson (Bradford Waterworks Engineer), Mr. J. H. Cox (City Surveyor), Mr. F. E. P. Edwards (City Architect), Mr. John H. Dawson (Secretary of the Bradford Master Builders' Association), and others. After the toast of "The King" had been submitted from the chair, Mr. J. Dawson (Huddersfield) proposed "The Defenders of our Empire," and Mr. A. Gadie responded. Mr. F. Smethurst (Oldham), in proposing "The National Federation of Building Trades' Employers," said that the Federation was the head of an organisation which was in its infancy. The strength of that organisation lay, essentially, in the district associations. In proportion to the strength of the districts and the loyalty of the individual members would be the strength of the Federation. Proceeding, the speaker remarked that Yorkshire had taken a leading step in the policy known as closer union, and the National Federation had now sent out instructions to arrange for carrying this policy into effect. It simply meant coming to an agreement with all the trades unions connected with the building trades whereby disputes could be settled by conciliation and not by strife. If these proposals were adopted by both sides, the utmost effort had been made, there could be no such thing as a strike or a lock-out.—Mr. G. Mansfield (York), acknowledging the toast, spoke of the improved relations between employers and their men, and said he believed the day was coming when they would bury the lock-out. Mr. A. J. Forsdike (Sheffield) proposed "The Municipal Corporation and City and Trade of Bradford." In dealing with municipal topics, the speaker mentioned that Sheffield had been trying to run a municipal works department, but it had been a gigantic failure. Corporations had no right to interfere with private traders; it was an injustice to the ratepayer. The Mayor, in the course of his reply, held with the previous speaker that the municipality must undertake such work as the individual could not do. He trusted that the great towns of this country would not be so short-sighted as to forget the ratepayer and the man who was building by industry. Municipalisation was a magnificent thing; it meant progress and civilisation. Bradford had been wonderfully successful through individualism, but he did not say that the time had not come for municipalisation and combination to have a strong turn.—Alderman David Wade also responded to the toast, and dealing particularly with the ratepayer, he expressed the belief that it would improve as soon as the effect of the South African war had worn off.—Mr. Scott (Hull) submitted "The Bradford Association," to which Mr. P. Drake and Mr. T. E. Taylor responded. Mr. Drake, speaking for the masons, commended the work of the Corporation, and which had been formed in Bradford, and of which Mr. C. Lupton was the able chairman.—Mr. Taylor said that the Bradford joiners were working together better than they had for years past. "The Yorkshire Federation of Building Trades' Employers" was proposed by Mr. W. G. Lupton, who said he was a strong supporter of trade organisations, and therefore had esteemed it a great honour to be made chairman of the Council of Conciliation between employers and employed in the Bradford building trades. The President responded. He remarked that the Federation had met somewhat under a cloud, for trade was depressed, and competition was accordingly keen. He advised them, however, not to cut prices so low as to make their work unremunerative. Other toasts followed.

BRITISH FIRE PREVENTION COMMITTEE.—A series of fire tests was conducted by the Executive of the British Fire Prevention Committee at their testing station on Wednesday afternoon, the tests being attended by representatives of the insurance offices, and others. The first test was with three windows glazed with electric glazed glazing, two being in teak frames and one in metal frame. The test was of three-quarters of an hour's duration, at temperatures up to 1,500° Fahr., followed by the direct application of water from a steam fire-engine at about 40 lb. pressure for two minutes. The casements withstood the test, and will be thus classified as affording temporary protection against fire, under the Committee's standards. A detailed official report will be issued in due course. The test is a record one in the annals

of the Committee's investigations. The second test was with a thin slab partition of a substance not dissimilar to concrete, measuring under 24 in. in thickness. This partition was tested with a view of being classified in the full protection class of the Universal Standards, which involves a test of no less than two and a half hours' duration at 1,800° Fahr., partitions under 24 in. thick, followed by the application of a stream of water for two minutes. The partition withstood the fire for the two and a half hours, and the flame did not pass through the partition. It, however, collapsed during the latter part of the application of water (at between 40 lb. and 45 lb. pressure) from the steam fire-engine. The test was the first of its kind in which so thin a partition withstood fire for so long, and it is anticipated that with some improvements the partition will be able to withstand the combined fire and water test, which is necessary before inclusion in the fully protective class. The usual official report will be prepared. The third test took the form of a series of private investigation with sprinklers, under actual conditions, with a view of ascertaining various points requiring elucidation.

MONUMENTS IN RICHMOND PARISH CHURCH.—The tablet which Charles Kean set up on the outside of the wall of the church, in 1839, in honour of his father's grave has been removed, and will be placed in the church, for the sake of its preservation. The tablet bears a profile portrait, sculptured by A. Fletcher, of Edmund Kean, who was buried (1833) in what was known as the "robing-room" vault beneath the west end of the south aisle; a brass plate will be affixed beneath the tablet, and will be inscribed with a record of its removal, and of the spot of the interment. In the churchyard were buried Mrs. Yates, the celebrated actress (1787); Gilbert Wakefield, the annotator of Lucretius (1801); and Lord Fitzwilliam (1853), who endowed the Fitzwilliam Museum, Cambridge University, and in the vaults Lord Brouncker (1688), first President of the Royal Society, and James Thomson (1748) to whom the Earl of Buchan erected a memorial fifty-six years after the poet's death. Four or five weeks ago a tablet was fixed against the front of No. 12, Grosvenor Street, Piccadilly, which, during the interval 1815-1824, was the home of Edmund Kean. The tablet in the church has been cleaned and restored under the direction of Mr. Thoms Brook, R.A.

A NEW ELECTRIC TOWER CRANE.—An electrically-operated tower crane of novel construction has recently been employed in Belgium in connexion with the building of an armoury, where it was used for dealing with large blocks of stone. The apparatus consists of a steel tower with a telescopic portion which can be extended so that the total height is 81 ft. above the ground level. The total height to which the hook can be raised is 77 ft., and the length of the jib is 124 ft. The crane is designed to lift a load of about 144 tons, and the lifting speed is 16 ft. per minute with a load of 10 tons. The crane runs on a track, with a gauge of about 12 ft., several hundred feet long, and is operated by three electric motors, one for the travelling wheels, another for revolving the tower, and the third for lifting or lowering the load. This type of hoisting apparatus not only dispenses with the necessity for expensive scaffolding in the construction of buildings, but also does the work of derricks and similar appliances.

THE "AULD BRIG" OF AYR.—This bridge has been restored to the condition in which it stood prior to the slight damage sustained by the structure, and the washing out of part of its temporary wooden supports by the flood of two months ago, with the exception that the bed of the river has been scoured out to a considerably greater depth between the piers. The contractor, in whose hands the temporary supporting works still are, has restored the wooden supports washed out, and the Burgh Surveyor has restored with concrete the large slice torn out of the north side of the foundation of the north pier. The Town Council, who have available a legacy of about 10,000*l.* left for the "rebuilding" of the bridge, are now considering the question whether the structure should be repaired, if that is possible, whether it should be partly rebuilt, or whether it should be wholly rebuilt, using for reconstruction all the visible stones of the bridge.

SELBOURNE PARISH CHURCH, HAMPSHIRE.—The rector asks for subscriptions to a fund for the proposed reparation of the parish church of St. Mary. The church, which is built of the Wolmer sandstone and Selbourne rock, consists, for the greater portion, of Transitional and Early English work. Twenty years ago the XIIIth century south aisle was removed under the directions and superintendence

Mr. Baes said the plaintiffs were the owners of a block of property in Cookridge-street, Leeds, and it was proposed to build a Roman Catholic Cathedral on the opposite side of the street. Thereupon the plaintiffs threatened to bring an action for injunction to restrain the defendants from taking place, and in the result, there was an agreement for reference, it being assumed, though not stated in terms, that there was a substantial interference with light, in respect of which the plaintiffs were entitled to damages. That the matter was referred to arbitrators was also stated, and when evidence was taken, but in consequence of the case of the Home and Colonial Stores v. Cols being before the

House of Lords, the umpire's decision was postponed until after the decision in that case. The ground and first floors were those taken into consideration, and there was a good deal of evidence showing that the windows of the ground floor had been materially altered, but with regard to the first floor there was no such evidence. The first floor was occupied as an architect's office, and it was apparently assumed that a person who had occupied an office for more than twenty years as an architect's office was not entitled to damages if someone opposite erected a building which rendered his premises less convenient for the purposes of such office. His (counsel's) contention was that the House of Lords in the *Colls*' case did not decide anything of the kind, but that a person claiming must establish a nuisance. The umpire, after stating the facts, found: "Notwithstanding the defendant's buildings, there remains sufficient light to the plaintiff's premises for all purposes of ordinary user, and the plaintiffs are not entitled to damages for interference with such ordinary user; but if I am entitled to take into account the damages which the plaintiffs have sustained in respect of loss of light to those parts of the said premises used for occupation in which a special amount of light is required, then I award 600*l.* damages to be paid by defendant to the plaintiffs." The umpire added:—"At the request of both parties I submit for the opinion of the Court above, whether, I am bound by the decision in the case of *Home and Colonial Stores v. Colls*, and therefore cannot award damages to the plaintiffs, or whether I can award damages in respect of interference with such special user of light as aforesaid." The point the plaintiffs wished to raise was whether or not an architect, occupying premises and only requiring such an ordinary amount of light as any ordinary architect needed, was entitled to have his business included within the category of special businesses. The learned counsel cited a number of cases, and submitted that the plaintiffs were entitled to the 600*l.* damages which had been found by the umpire, and that the technical question was not involved as to whether or not there was an actionable nuisance.

Mr. Waugh contended that the plaintiffs were only entitled to damages if they were so entitled in law, and as it had been found by the umpire that there was a sufficient amount of light for ordinary user, then no actionable wrong had been occasioned.

At the close of the arguments, his lordship reserved judgment.

APPEAL BY A CONTRACTOR.

The case of the Teignmouth Urban District Council v. Slocombe came before a Divisional Court of King's Bench, composed of the Lord Chief Justice and Justices Kennedy and Ridley, on the 12th and 13th insts., on a motion by the defendant to set aside the award of the Official Referee.

Mr. Clavell Salter, K.C., and Mr. J. B. Matthews appeared for the appellant, and Mr. C. A. Russell, K.C., and Mr. Hudson for the respondents.

Mr. Matthews said that the action was brought by the Council against the defendant for damages for breach of contract with regard to the relining and roofing of the Hazeldown reservoir, and the Official Referee gave judgment for the Council for 2,500*l.* damages. The claim originally was for 2,500*l.* The Referee rejected certain evidence, which would have had the greatest weight if he had heard it. The points of his appeal were that the finding was against the weight of evidence, the terms of the contract, and the wrongful rejection of certain evidence. The reservoir had been in existence for some years before the contract was entered into. It was an open reservoir, and the sides of it were partly natural soil and partly made embankment. It was lined with concrete. It was decided to strip off the old lining and reline it, and to put a concrete roof over it. That was the kind of work to be done under the contract. The scheme originally was this:—That 12 in. of concrete were to be laid upon the floor and sides of the reservoir, and upon the top of it best bricks of a specified kind to be placed close together. When the reservoir had been stripped of the old concrete the Surveyor of the Council reported that the nature of the soil was very unsatisfactory to support concrete next to it. In his view it would be much better to transpose the bricks and concrete. The contract for the original work was signed on February 22. It was not until March 4 that the surveyor made his report to the Council expressing the desirability of making an alteration in the lining of the reservoir. The

Council thereupon authorised the surveyor to see the Inspector of the Local Government Board, who had held the inquiry prior to the granting of the loan, to get his sanction of the change. The alteration was sanctioned, and the work proceeded on that basis. As the concrete was next to the water there had to be some changes to make the concrete watertight. The damages were awarded by the Referee for the alleged scamping of his client's work on the whole job. The work was completed in October, 1899, and payment of over 5,000*l.* for the work was duly made, the last payment being in April, 1899. From that time to October, 1903, no complaint was made, the final certificate having been duly given. Clause 6 of the contract gave the Council power to bring an action for damages notwithstanding the final certificate and final payment. The Official Referee found that the action was maintainable, that there had been a breach of contract, and he awarded the Council 2,000*l.* damages. Counsel's contention was that the Referee's holding was wrong in fact and in law, and that the damages did not arise from any fault on the part of the defendant. It was alleged that the work was not according to contract. That was so, but the contractor had the permission and approval of the surveyor to change the quality of the concrete.

The Lord Chief Justice said the point he should like Mr. Russell to raise was that on the construction of the contract.

Mr. Russell said his case was that the concrete had never been properly mixed; it was wanting in adhesive power, and that the cement was not in proper proportions. Then, again, there was a substantial deficiency in the thickness of concrete in all test-holes. His contention was that the work was done that the Council suffered from loss of water was due to the defective concrete.

At this point the Court intimated that it was not necessary to hear the learned counsel further.

In giving judgment, the Lord Chief Justice said he had no doubt that the technical issue decided by the Official Referee was right, and that there was ample evidence for him to come to the conclusion which he had come to. A point had been made of the clause in the contract as to deviations and alterations, and his lordship did not think that he should altogether agree with the construction placed upon that clause. But to a large extent this was a preliminary point, and it could not be said that there had been a breach of contract, because the contractor had not the written order of the surveyor or engineer. He did not agree with the judgment of the Official Referee as to the content of the contract. It was quite clear, however, to his mind, whether, under the contract, deviations were allowed or not, that the brickwork was not as specified in the contract. He thought the finding of the Official Referee was right, and that the concrete was not made in accordance with the specification or with the orders of the engineer. He considered that the findings of the Official Referee were not wrong in law, and that his construction of the contract, as bearing upon the ultimate decision, was such as justified his lordship in saying that the final decision was right. He thought the appeal should be dismissed, with costs.

Justices Kennedy and Ridley concurred.

QUESTION OF LIABILITY UNDER THE WORKMEN'S COMPENSATION ACT.

The case of *Clasper v. the Commercial Gas Company* came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Mathew and Cozens-Hardy, on the 14th inst., on the appeal of the Company against an award in favour of the workman by the County Court judge, sitting at Bow, under the Workmen's Compensation Act, 1897.

Mr. Montague Lush, K.C., and Mr. Colman appeared for the appellant Company, and Mr. Duncan for the workman.

Mr. Lush said that the applicant's father was a slater, and he was engaged by the Company to take off the roof of a building in which they stored their coke, and to do other repairs to it. He was to be paid 7*s.* 6*d.* a square for the tiling work, and those parts of the work which could not be paid for as piece-work were to be paid for by time. The work was more than he alone could manage, and it was understood that he was to engage what help he required, the men so employed to be paid by the Company according to the character of the work they did at the rate agreed. The applicant was taken on by his father with one or two other men to assist him in the job, and while engaged at work for which he was to be paid by time his foot slipped and he fell and was injured. Before the County

Court judge the point was taken by Mr. Colman, on behalf of the Company, that the injured man was not in the employment of the Company, but in that of his father, and, therefore, while they did not dispute that the accident arose out of work that would have entitled the man to compensation had he been in their employment, they submitted that, under the circumstances, the Company were not liable. The County Court judge, however, decided otherwise, and the present appeal was brought, on the ground that there was no evidence upon which the judge could hold that the injured man was the servant of the Company when he met with the accident on their premises.

Mr. Duncan, having supported the judgment in the Court below,

The Master of the Rolls, in giving judgment, said the evidence of the Engineer of the Company was that he had no idea what men the applicant's father engaged. He had agreed with him alone for the work to be done, leaving him at liberty to engage as many men to help him as he might require. The respondents, on the other hand, said the Company's contention that the injured man was employed by his father. That being so, the young man was not the servant of the Company, and they were not liable for the injuries he had sustained.

The Lords Justices concurred, and the appeal was accordingly allowed.

APPEAL BY MASON'S LABOURER.

The case of *O'Flaherty v. the Owners of the Edmondson Colliery* came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Mathew and Cozens-Hardy, on the 13th inst., on the appeal of the applicant from an award of the County Court Judge of Durham under the Workmen's Compensation Act, 1897.

Mr. Meynell, for the applicant, said his client was a mason's labourer, and in July, 1900, in the course of his employment with the defendants, he met with an accident which resulted in the loss of his left eye and the partial loss of the sight of his right eye. The respondents paid him compensation from the date of the accident till December 5, 1900, when they stopped the payments, alleging that the man was able to do some light work. They did not allege, and never had alleged, that the man was capable of resuming his ordinary work as a mason. The applicant then took proceedings in the Durham County Court under the Act, and on April 21, 1901, he was awarded the sum of 6*s.* 2*d.* a week from December 5, 1902, when the payments were stopped. The learned judge appeared to have thought that the man was capable of doing something, and, on the defendants undertaking to give him some light work, he was able to perform at a fixed rate of 18*s.* 3*d.* a week. He predicted that the award be suspended during that time. The respondents gave the applicant certain work at the colliery screens and in stacking timber, but he alleged he was unable to perform the work and gave it up. He remained out of work till October 16, 1903, when he again applied to the County Court judge for compensation. The County Court judge gave him compensation at the same rate, viz. 6*s.* 2*d.* a week from April 21 to October 16, 1903, and at the rate of 1*d.* a week thereafter. The applicant, on July 14, 1904, having failed to get any work in the open market, applied to have the compensation of 1*d.* a week increased. The County Court judge, however, refused to alter the award on the ground that the circumstances had not changed since the last order. The learned judge said that the man was roundly charged with malingering, for he had lost an eye. He Honour, however, thought that the applicant should have presented himself for work and have stayed to do what he could, however little, and so meet the not unreasonable requirements of the respondents. The learned counsel submitted that the County Court judge, on the admitted facts, ought to have held that the applicant was still incapacitated from work and have increased the amount of the compensation accordingly.

In the result, their lordships, without calling upon counsel for the respondents, held that the question involved was one purely of fact for the County Court judge, and dismissed the appeal, with costs.

SCAFFOLDING AND THE WORKMEN'S COMPENSATION ACT.

The case of *Fletcher v. Hawley* came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Mathew and Cozens-Hardy, on the 17th inst., on the appeal of the applicant from a decision of the County Court judge of

Yorkshire, sitting at Barnsley, as arbitrator under the Workmen's Compensation Act, 1897.

Mr. S. T. Evans, K.C., M.P., in support of the appeal, said that the applicant was injured by an accident in the course of his employment with the defendant, and his employment with the defendant was under the Act. Two points were taken by the defendant. The first was that the building upon which the man was engaged at the time of the accident was less than 30 ft. high, but that question the County Court judge decided in favour of the workman. The second point was that the case did not come within the provisions of the statute, as the work upon which the applicant was engaged did not necessitate the use of scaffolding. The building in question was a shop, which was being converted into a coffee-house. The defendant, applicant's employer, had contracted to do the woodwork, and he had erected no scaffolding, but a second contractor, who was responsible for the brickwork, was using scaffolding. The County Court judge, in these circumstances, found that the building was being repaired by means of scaffolding, that the applicant had used this scaffolding for his own convenience, but that it was not necessary for his particular work, and that at the time of the accident he was not using the scaffolding. For these reasons the County Court judge held that the case did not come within the Statute. The learned counsel submitted that the fact that scaffolding was being used was alone quite sufficient to bring the case within the statute.

Mr. Israel Davis, having supported the decision in the Court below, the Master of the Rolls, in giving judgment, said that the appeal must, in his opinion, be allowed. The case was covered by a previous decision of the Court. All the Act required was that scaffolding at the time of the accident was being used on the building where the workman was employed. He was entitled to the same benefit under the Act if his occupation was one which did not require him to use the scaffolding put up by another subcontractor.

The Lords Justices concurred, and the appeal was accordingly allowed, with costs.

CRANE-ERECTOR'S APPEAL UNDER THE WORKMEN'S COMPENSATION ACT.

The case of Aylward, v. Matthews came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Stirling and Mathew, on the 18th inst., on the appeal of the defendant, the employer, from a decision of the Lambeth County Court judge under the Workmen's Compensation Act, 1897.

In this case Aylward, the applicant, was a labourer in the employment of the defendant, and was engaged in the erection of a steam crane platform at Salter's-hill Board School extension. This platform was a wooden structure consisting of long wooden legs, each leg consisting of four uprights connected together by cross pieces of wood nailed on to the uprights so as to form a hollow square, each side measuring 4½ ft. The legs were let into the ground, where they were surrounded by bricks, etc., to keep them firm. To construct the platform, planks were placed on the cross pieces, and ladders were placed on the planks. These ladders and planks formed the scaffolding by means of which the platform was erected. The defendant's business was that of a crane-erector, and he erected cranes with their platforms by contract, and this he was doing in the present case. When the defendant had completed the erection of a crane-platform and crane, he and his men would leave, and they had no more to do with the building. The day the accident happened the applicant was working on one of the legs of the crane-platform, being on a ladder inside the leg, and while descending the ladder the plank on which it rested broke, the result being that the man fell and was injured. The erection at the time of the accident was 62 ft. in height. When it was erected a steam engine was to be placed on the platform, but this had not been done at the time of the accident. The foundations of the school buildings had only been laid at the time. The County Court judge found that the steam-crane platform was a "building" within the meaning of the Act exceeding 30 ft. in height, that it was being erected by means of scaffolding, which was a substantial part of the process of the work, and that the defendant was the under-taker and respect thereof. He accordingly awarded the applicant compensation during incapacity. The defendant, however, appealed on the ground that this temporary wooden structure could not be called a

"building" within the meaning of section 7 sub-section 1 of the Act.

At the conclusion of the arguments of counsel, their lordships held that the structure in question was capable of being a "building" within the meaning of the Act, and dismissed the appeal, with costs.

Mr. Minton Sanhouse appeared for the appellant, and Mr. John O'Connor for the respondent on the appeal.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

27,834 of 1903.—F. J. R. LEE: *Kilns for Burning Bricks, Tiles, and other Clay Goods, and Lime and Cement, also for Burning Sanitary Ware, and for Salt Glazing.*

This invention relates to kilns for burning bricks, tiles, and other clay goods, and lime and cement, also for burning sanitary ware, and for salt glazing. This invention consists of an arrangement connecting each kiln in a series of kilns with one or more double flues, or one or more pairs of parallel flues, constructed either side by side or one above the other, and having openings communicating between each of the two sections of the two flues, of which each double flue or pair of flues is composed, as well as shafts or connexions, between each of the said sections or two flues of each pair, and the interior of each kiln of the series.

27,955 of 1903.—T. HUBBLE and C. J. JOHNSON: *Windows.*

This invention relates to windows, and has for its object to provide simple means whereby the window may be removed from the frame to facilitate cleaning and repairs. This is effected by making the beading or part thereof detachable so as to permit the window to be withdrawn, and the invention relates more particularly to the manner in which this is effected.

2,024 of 1904.—W. I. RODWAY and W. B. GOOD: *A Tool or Implement for Breaking Coal, which is also applicable to Riveting and other purposes.*

A tool or implement for breaking coal, which is also applicable to riveting and other purposes, characterised by a rod having a weighted head, the rod of which is mounted and retained in a tubular casing in such a manner as to be capable of a sliding or reciprocating action therein, in combination with a suitable working tool which is attached or formed as part of the lower end of the tubular casing.

2,574 of 1904.—R. GALBRAITH: *Stoves and Furnaces.*

In a stove or furnace, consisting in the combination of a grate normally closed, an ash-pit arranged below said grate, a combustion chamber arranged above said grate, an air chamber surrounding said grate, air passages leading from said ash-pit into said air chamber, and other air passages leading from said air chamber into said combustion chamber immediately above said grate to the outside of the fuel.

3,838 of 1904.—S. SAUNDERS and T. ROBERTS: *Safety Valves of Boilers Used in Connection with Hot-water Heating Apparatus, and the like.*

This consists in the combination with the safety valve of a boiler used with hot-water heating apparatus, or the like, of a secondary auxiliary valve opened against the action of a spring by a part or stop carried by the safety valve when the safety valve is secured to the housing of the auxiliary valve, and positively closed by the spring when the safety valve is removed.

3,861 of 1904.—N. F. RAMSAY: *Latches or Locks for Sliding Doors, and the like.*

A latch or lock for sliding doors, and the like, consisting in the combination of two spring-controlled hooked bolts, adapted to be forced apart in opposite directions at will, a co-acting keeper or striking head for automatically retracting said bolts when released, is being effected, and designed to be engaged and locked thereby, and manually operated means for retracting the bolts to effect release of the keeper or striking head.

3,937 of 1904.—H. FOX, JUN., and J. WHALE: *Door and Window Fastenings.*

A door or window fastening of which the handle by which the bolt is drawn into the case has fixed rigidly thereto a turning piece, which, by an axial turn of the handle, is turned in a plane which is parallel with that of the front plate of the case, and thereby

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

engaged with a stump of the case, and the bolt secured in a desired position.

4,045 of 1904.—W. J. GIBSON: *Air-Warming Fireplaces.*

This consists in the combination with a fireplace having a firebrick bottom and a firebrick back, of an air-heating chamber, formed integrally with the fireplace, extending beneath the bottom and behind the back, provided with internal baffle plates and having an inlet or inlets for cold air at the bottom of the chamber, and an outlet or outlets for heated air at the top; with or without connexion between the outlets and valve controlled apertures in the front of the fireplace.

4,255 of 1904.—B. ADDICOTT and G. HOLLAND: *Tongs for Domestic Use.*

Tongs for domestic use, characterised by the combination of a pair of pivoted legs having ears or ends extending past a pivot, and which are respectively pivoted or hinged to a spring handle in such a manner that the legs are retained open and can be closed through the medium of the handle.

4,270 of 1904.—E. CHOWE: *Stays for Securing the Legs of Folding Tables, Supporting Hinged Flaps, and the like.*

This relates to a jointed stay applied to table legs, consisting of hinged brackets and the like, one member of which is prolonged to bear on a wedge-shaped piece fixed to the underside of the table top or bracket.

4,306 of 1904.—L. ANIDIAH: *Safety Apparatus for Use in Window Cleaning, and for other purposes.*

A safety apparatus for use in cleaning windows, wherein a platform surrounded by a shield and adapted to be projected through a window opening, is attached to a front frame adapted to lie against the inner side of the window frame, the said front frame being provided with extensible side portions for enabling the apparatus to be applied to windows of varying width.

4,574 of 1904.—M. TENNANT: *Air-Filtering Ventilators.*

This invention relates to an air-filtering ventilator for attachment to windows. The attachment consists of a filtering blind of gauze muslin, wire gauze, or other suitable air-filtering medium of such size as to close the space formed by the opening of the window. One edge of the filtering blind is attached directly or indirectly to the opening edge of the window, and the opposite edge is attached to a spring roller or other equivalent device operating to keep the blind taut in all positions of the window. The spring roller or other device is preferably enclosed in a suitable casing within which the blind is automatically drawn as the window is closed.

12,281 of 1904.—F. M. BURROWES: *A Foldable Table or Stand.*

A foldable stand, consisting of pivoted legs, braces for said legs, each pivoted to a leg at its outer end, and having an offset portion at its inner end, said braces being formed of elastic material, and a washer loosely mounted upon the offset portion of said braces arranged to travel in oppositely arranged slits adjoining the guide groove in the stand, whereby the offset portion may slide within the washer, said guide groove terminating in a transverse opening into which said offset portion is adapted to spring when the brace is in open position.

19,624 of 1904.—W. SCOTT and A. H. STENT: *Materials for the Construction of Buildings, more especially Military Huts, Bungalows, and the like.*

A double wall mainly composed of plaster, cement, concrete, or other suitable plastic material, consisting of independent series of ribs isolated from one another so as to maintain a continuous air space between the two skins of the wall, open meshed screws attached to the outer faces of the respective series of ribs, and serving as cores for the respective members of the double wall, and a covering of plastic material applied to each screen.

24,095 of 1904.—F. J. M. M. DUCASTEL: *Flood Gates and similar Devices for Dams, Weirs, and the like.*

A dam in which the absolute tightness of the flood gates is obtained by means of joints situated at the two extremities of the panel or panels forming said gates, and on their down-stream faces, the said joints being constituted by beams of wood or other suitable material, one firmly attached to the masonry piers, the other to the gates, and normally maintained strongly in contact by the pressure of the water, the panel or panels being adapted to be slightly displaced towards the up-stream during the operation of lifting or lowering.

LEAD, &c.

	Per ton, in London.	
	£ s. d.	£ s. d.
LEAD—Sheet, English, 8lb. and up	15 12 6	...
Pipe in coils	16 2 6	—
Soil pipe	18 12 6	...
Compo pipe.....	18 12 6	—
ZINC—Sheet—		
Vieille Montagne .....,ton	30 15 0	—

Silesian.....	30	10	0	...	—
COPPER—				...	

.....per lb.

Strong Sheet.....	per lb.	0	0	10	---
Thin	25	0	0	11	---
Copper nails	25	0	0	10	---
BRASS—					
Strong Sheet.....	25	0	0	92	---
Thin	25	0	0	10	---
Tin—English Ingots	25	0	1	44	---
SOLDER—Plumbers'	25	0	0	64	---
Tinmen's	25	0	0	8	---
Blowpipe.....	25	0	0	9	---

ENGLISH SHEET GLASS IN CRATES.

LET GLASS IN CRATES

ENGLISH SHEET GLASS IN CRATES.			
15	oz.	thirds	23d. per ft. delivered.
21		fourths	2d. "
27		fourths	3d. "
33		fourths	4d. "
39		fourths	5d. "
45		fourths	6d. "
51		fourths	7d. "
57		fourths	8d. "
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81		fourths	12d. "
87		fourths	13d. "
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627		fourths	103d. "
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729		fourths	120d. "
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771		fourths	127d. "
777		fourths	128d. "
783		fourths	129d. "
789		fourths	130d. "
795		fourths	131d. "
801		fourths	132d. "
807		fourths	133d. "
813		fourths	134d. "
819		fourths	135d. "
825		fourths	136d. "
831		fourths	137d. "
837		fourths	138d. "
843		fourths	139d. "
849		fourths	140d. "
855		fourths	141d. "
861		fourths	142d. "
867		fourths	143d. "
873		fourths	144d. "
879		fourths	145d. "
885		fourths	146d. "
891		fourths	147d. "
897		fourths	148d. "
903		fourths	149d. "
909		fourths	150d. "
915		fourths	151d. "
921		fourths	152d. "
927		fourths	153d. "
933		fourths	154d. "
939		fourths	155d. "
945		fourths	156d. "
951		fourths	157d. "
957		fourths	158d. "
963		fourths	159d. "
969		fourths	160d. "
975		fourths	161d. "
981		fourths	162d. "
987		fourths	163d. "
993		fourths	164d. "
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1041		fourths	172d. "
1047		fourths	173d. "
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1059		fourths	175d. "
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1089		fourths	180d. "
1095		fourths	181d. "
1101		fourths	182d. "
1107		fourths	183d. "
1113		fourths	184d. "
1119		fourths	185d. "
1125		fourths	186d. "
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1371		fourths	227d. "
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1389		fourths	230d. "
1395		fourths	231d. "
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1407		fourths	233d. "
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1797		fourths	298d. "
1803		fourths	299d. "
1809		fourths	300d. "
1815		fourths	301d. "
1821		fourths	302d. "
1827		fourths	303d. "
1833		fourths	304d. "
1839		fourths	305d. "
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1875		fourths	311d. "
1881		fourths	312d. "
1887		fourths	313d. "
1893		fourths	314d. "
1899		fourths	315d. "
1905		fourths	316d. "
1911		fourths	317d. "
1917		fourths	318d. "
1923		fourths	319d. "
1929		fourths	320d. "
1935		fourths	321d. "
1941		fourths	322d. "
1947		fourths	323d. "
1953		fourths	324d. "
1959		fourths	325d. "
1965		fourths	326d. "
1971		fourths	327d. "
1977		fourths	328d. "
1983		fourths	329d. "
1989		fourths	330d. "
1995		fourths	331d. "
2001		fourths	332d. "
2007		fourths	333d. "
2013		fourths	334d. "
2019		fourths	335d. "
2025		fourths	336d. "
2031		fourths	337d. "
2037		fourths	338d. "
2043		fourths	339d. "
2049		fourths	340d. "
2055		fourths	341d. "
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2103		fourths	349d. "
2109		fourths	350d. "
2115		fourths	351d. "
2121		fourths	352d. "
2127		fourths	353d. "
2133		fourths	354d. "
2139		fourths	355d. "
2145		fourths	356d. "
2151		fourths	357d. "
2157		fourths	358d. "
2163		fourths	359d. "
2169		fourths	360d. "
2175		fourths	361d. "
2181		fourths	362d. "
2187		fourths	363d. "
2193		fourths	364d. "
2199		fourths	365d. "
2205		fourths	366d. "
2211		fourths	367d. "
2217		fourths	368d. "
2223		fourths	369d. "
2229		fourths	370d. "
2235		fourths	371d. "
2241		fourths	372d

OILS, &c.		£	s.	d.
Raw Linseed Oil in pipes	per gallon	0	1	5

pages

"	"	"	in barrels	"	0 1 8
"	"	"	in drums	"	0 1 8
Boiled	"	"	in pipes	"	0 1 8
"	"	"	in barrels	"	0 1 8
"	"	"	in drums	"	0 1 10
Turpentine, in barrels			.....	"	0 3 4
"			in drums	"	0 3 4
Genuine Ground English White Lead			per ton	19 15 0	0
Red Lead, Dry				19 5 0	0
Best Linseed Oil Putty			per cwt.	0 6 6	0
Stockholm Tar			per barrel	1 12 0	0

VARNISHES, &c.	Per gallon.
	£ s. d.
Fine Pale Oak Varnish	0 2 6

1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

Fine Pale Oak Varnish	0	8	0
Superfine Pale Elastic Oak	0	12	0
Fine Extra Hard Church Oak	0	10	0
Superfine Hard-drying Oak, for seats of	0	14	0
Fine Elastic Carriage	0	13	6
Superfine Pale Elastic Carriage	0	16	0
Fine Pale Maple	0	16	0
Superfine Pale Elastic Maple	0	16	0
Extra Pale French Oil	1	1	0
Eggshell Flattening Varnish	0	18	0
White Copal Enamel	0	4	0
Best Japan Gold Size	0	10	6
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Black Japan	0	16	0
Berlin Black	0	16	0
Knotting	0	10	0
French and Brush Polish	0	10	0

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Subscription

THE BUILDER (Published Weekly) is supplied DIRECT from the Office to residents in every part of the British Kingdom at the rate of 28s. per annum (12 numbers) PREPAID. To parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 28s. per annum. Remittances (payable to J. MORGAN) should be addressed to the Publisher of "THE BUILDER," Catherine-street, W.C.

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TENDERS.

ENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursday.* [N.B.—We cannot publish Tenders unless authenticated either by a letter from the Editor or by a receipt from the Tenderer, and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.* unless in some exceptional cases specially stated in the terms.]

* Denotes accepted. † Denotes provisionally accepted.

ABERDEEN—For constructing sewers, etc., in the Hamersmith-road and Irving-place, for the Town Council. Mr. W. Dyack, Burgh Surveyor, Aberdeen.—
Hamersmith-road.

B. McKay, Abergeild-terrace.....	£94	7	5
<i>Irving-place.</i>			
B. McKay, Abergeild-terrace.....	£93	10	0

ALDERSHOT—For two houses at Aldershot, for Mr. H. Stratton. Messrs. Friend & Lloyd, architects, Aldershot, Hants:—

Martin, Wells, & Co. £1,200	H. G. Mosses.....	£1,011	
K. Kemp.....	1,120	W. L. Edgworth.....	978
M. Wetherell.....	1,089	W. L. Edgworth.....	960
W. L. Edgworth.....	1,180	Cesar Bros., Farn-	
W. H. Pullinger.....	1,079	ham Hale*.....	950
Crosby & Co.	1,075	G. Kersley.....	895

AYLSHAM—For alterations and additions to residences, Market-place, Aylsham, Norfolk. Messrs. Jorran & Buckingham, architects, Aylsham.—

H. Blyth.....	£493	G. O. W. & H. Wade,	
H. Tuddenham.....	447	Aylsham*.....	£406

TENDERS.—Continued on page 77.

doi:10.1017/S0022292412001007 Printed in the United Kingdom

BS—Continued on page 77.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered
*Free Public Library	Borough of Nelson	50l., 25l., 15l.	Mar. 4

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Hauling Flagg and Kerbs	Manchester Corporation	Chief Clerk, Highways Department, Town Hall, Manchester	Jan. 21
Sewering, etc., Bellott-street, etc., Chesham	do.	Paving, etc., Depart. (Surveyor's Office), Town Hall, Manchester	do.
Draining, etc., Gregory-street, Ardwick	do.	do.	do.
Draining, etc., Rostron-street, Ardwick	do.	do.	do.
Draining, etc., Passage, Rusholme	do.	do.	do.
Dwelling-houses in the Parish of Matlock	Haddo House Estates	Estate Office, Haddo House, Aberdeen	Jan. 23
Dwelling-houses in the Parish of Tarves	do.	do.	do.
Dwelling-houses in the Parish of Fyvie	do.	do.	do.
Dwelling-houses in the Parish of Ellon	do.	do.	do.
Dwelling-houses in the Parish of New Deer	do.	do.	do.
570 yds. of Approaches to Bridge over Lossie	Elgin C.C.	A. Hogg, County Road Surveyor, 24, Academy-street, Elgin	do.
Undergrd. Conv., Corner of Shields-rd. and Union-rd	Newcastle-on-Tyne Corporation	City Engineer's Office, Town Hall, Newcastle	do.
Convenience, Heston-road	do.	do.	do.
Timber for Gasworks	Leicester Corporation	R. H. Townsley, Gas Offices, East Parade, Leeds	do.
Portland Cement	Rochdale Tramways Committee	S. S. Platt, Borough Surveyor, Town Hall, Rochdale	do.
Combined Joint and Sole Plates	do.	do.	do.
Retaining Walls, Berry Brow, Newton Heath	Manchester Corporation	T. De Courcy Meads, City Surveyor, Town Hall, Manchester	do.
Chimney at the Gasworks, St. George's Quay	Lancaster Corporation	C. Arncliffe, Engineer, at the Gasworks	do.
Science Laboratory, Sir T. Middlecot's School, Kilton	The Governors	J. Rowell, Architect, Church-lane, Boston	do.
Stables and Coachhouse, Summerfield, Morley	Mr. A. Glover	T. A. Buttery & S. B. Birds, Architects, Morley	do.
Alterations to Shop Premises, High-street, Skipton	Southampton Corporation	Borough Engineer's Office, Municipal Buildings, Southampton	do.
Private Street Works, Whitworth-road, etc.	Ilington Borough Council	J. Patten Barber, Borough Engineer, Town Hall, Upper-street, N.	Jan. 24
Wrought-iron Railings, Gates, etc., at Playgrounds	Secretary of State for India	Director-General of Stores, India Office, Whitehall, S.W.	do.
Fish Boils for 87-lb. Ralls	do.	A. H. Hind, Architect, 3, Grey Friars, Leicester	do.
Plumbing Work at Cottage Homes at Cotesworth	W. H. Hill & Son, Architects, 52, South Mall, Cork	J. W. M'Intyre, Architect, Letterkenny	do.
Cleaning Pontoons, Seacombe	Wallasey Ferries Committee	Ferry Manager, Egremont Ferry, Cheshire	do.
Repaving, Heating, & Ventilating Wes. Cha., Barton	Committee of Second Pres. Church	J. Gibson, Architect, Stamford-street, Stalybridge	do.
Pulpit, Com.-table, etc., Trinity Presby. Ch., Cork	Bedwelly Guardians	W. H. Hill & Son, Architects, 52, South Mall, Cork	do.
Additions, etc., to Mase, Rapthor, Londonderry	do.	J. A. Shepard, Clerk, Town Hall, Tredegar	Jan. 25
Steam Dynamoes, Booster, etc.	do.	do.	do.
Cables and Wiring	West Green U.D.C.	C. J. Gurney, Surveyor, Town Hall, Wood Green	do.
Roadworks, Rosebery-road and Donovan-avenue	Fast India Railway Co.	C. W. Young, Secretary, Nicholas-lane, London, E.C.	do.
Deck Bridges, Leather Belting, etc.	Tanvoco Building Club	T. W. Millar, Architect, Mountain Ash	do.
Thirty Cottages at Penrhyn-lea	Dunbarton Town Council	W. R. Copland, C.E., 146, West Regent-street, Glasgow	do.
1,800 yds. of Main Conduit, Roundridge-road, etc.	Shebborough Borough Council	H. Edwards, Borough Engineer, 346, Kennington-road, S.E.	do.
Thirty-one Shop Vans and Twelve Water Vans	Presbyterian Committee	Shayler & Ridge, Architects, Bank-chambers, Gower-st.	do.
Manse at Llanymynech	Southampton Incorporation	Mitchell, Son, & Gutteridge, Survs., 9, Portland-st., Southampton	Jan. 26
Paint. Bldgs., Incorporation Infrn., Shirley Warren	Edinburgh Corporation	H. Williams, Secretary, Office of Works, Dublin	do.
Remov. Bldgs., etc., on site Roy. Coll. of Science, Dublin	Edinburgh Corporation	B. Morham, City Arch. Pub. Wks. Office, City-chbrs., Edinburgh	do.
Minor Alterations to Committee Rooms, City-chmbrs.	Andover R.D.C.	J. Wormald, District Surveyor, South Cottage, Andover	do.
545 ft. of Paved Channelling	do.	do.	do.
Repair Foot-bdgs., Church-st., Hurstbourne, Tarrant	The Commissioners	F. Smith, Architect, Carrara-buildings, High-street, Gillingham	do.
Treasure-house Hall, nr. Balmoral-rd., Gillingham, Kent	The Corporation	F. F. Hedges, Clerk, Market-place, Wallingford	do.
Repeating Bridge, Streteley and Goring	Rawmarsh U.D.C.	F. J. Elford, Borough Engineer, Southend-on-Sea	Jan. 27
Manual Instruc. Bldg., Queen's-rd., Southend-on-Sea	do.	J. Platts, Architect, High-street, Rotherham	Jan. 28
Figs., etc., Lib., Read-rms., Ramswarth-lk., Parkgate	do.	S. Jackson & Son, Architects, Tanglefield-chambers, Bradford	do.
Warehouses, Canal-road, Bradford	do.	J. Holden, Surveyor, 20, Park-place, Cardiff	do.
Limestone and Team Labour	Bradford Corporation	F. Stevens, Town Clerk, Town Hall, Bradford	do.
Clee Hill Stone	do.	do.	do.
750 tons of Steel Girder Tram Rails	do.	do.	do.
37 tons of Fishplates	Edinburgh District Lunacy Board	H. J. Blane, R.S.A., 25, Rutland-square, Edinburgh	do.
Eighty Steel Poles for Tramways	do.	do.	do.
Water Supply Pipes, Bangourvillage	do.	do.	do.
Digging & Laying Drain Pipes, etc., Bangourvillage	do.	do.	do.
Supplying & Laying Drain Pipes, Bangourvillage	do.	do.	do.
Making Roads	do.	do.	do.
Exit at Cardin Workhouse	do.	do.	do.
Gas Engine and Pump for Raising Sewage Sludge	do.	do.	do.
Additions to Great Wyrley Council School	do.	do.	do.
Broken Granite	do.	do.	do.
Higher Standard Mixed School at Grange, Rhos	do.	do.	do.
5,000 tons of Welsh Granite Setts	do.	do.	do.
800 tons of Scotch Granite Setts	do.	do.	do.
Extension of Electrical Power Station	do.	do.	do.
Water Pipe, Aringer	do.	do.	do.
Two Cottages at Daventry	do.	do.	do.
Gas-holder Concrete Tank at North Shields Works	do.	do.	do.
Two Single Cottages at St. Nicholas Village	do.	do.	do.
Eighteen Cottages at Ystrad Mynach	do.	do.	do.
Making-up Winsley's Roads, Colchester	do.	do.	do.
Enamelled & Glazed Bricks & Lavatory Fittings	do.	do.	do.
Close Wood or Iron Fence, Hunstanton C.	do.	do.	do.
Footpath at Percy Main	do.	do.	do.
Concrete Retaining Wall in Liddell-street, N. Shields	do.	do.	do.
Twenty-five Workmen's Cottages at Rhyladen	do.	do.	do.
Buildings on a New Site, Tavistock	do.	do.	do.
200 yds. of 9-in. Stoneware Pipe Sewers	do.	do.	do.
Remov. of Bridge & Erect. Steel Bridge over R. Mole	do.	do.	do.
Two Silt Filters & Underdrains Works at Harshall	do.	do.	do.
Excavating and Construction of New Boiler House	do.	do.	do.
Flags, Kerbs, Grit Setts, Macadam, etc.	do.	do.	do.
Stabling, Lofts, etc., & Boundary Walls at Merthyr	do.	do.	do.
Eighteen Cottages at Crumlin	do.	do.	do.
Portable Sch. & Offices in Strathellan, nr. Tyndrum	do.	do.	do.
Road Materials	do.	do.	do.
Pat Paving	do.	do.	do.
Excavating and Construction of Stand-on-the-Green	do.	do.	do.
Laundry Machinery, etc.	do.	do.	do.
Electric Tramways	do.	do.	do.
Reconstruction Two Bridges, Frederick-rd., Fendleton	do.	do.	do.

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered
*Building of Show-yard Alterations, etc., to Property in Fisher-street Materials and Supplies Kerbing, Metalling, etc. Materials Carro Reservoir *Drainage Works Rebuilding the Labour-in-Vain Inn, Pontypool *New Grammar School, Farnham, Surrey *Engine-shed, etc., Carmarthen *New Spring Office at Leeds *4 miles of C.I. Water Pipes, and Laying same 4 miles of C.I. Water Pipes and Laying same Sewage Disposal Works, Royston Girl School and Extensions, Chesham Hay Gasworks (Retort House Roof, etc.), Goring-on-Thames *Annual Contracts Sewage Disposal and Refuse Destructor Works Retort House Extension, Electricity Works, London Retort House Steel Gasholder and Tank at Gasworks Kushkagh Bridge Storage Reservoir, etc., on the Scout Moor Brook 10,500 lbs. yds. 12-in. C.I. Pipes from G.H. Reservoir *Works and Materials Manager's House, etc., at Belgrave Pumping Station Deepening, Widening, etc., St. George's Channel, Bermuda Two Pits 200 fathoms deep, at Bedlam, nr. Glenboig House, Hedon-road, Hull *Cottages, Huddersfield *Work at Parish Church, Knockando *Work at Newburgh Chapel *Pierces Premises, 5, 7, and 9, North-street, Belfast *Alterations to Workhouse, Salmon-lane, Ratcliffe, E. *14-in. Gauge Railway, etc. *Erection of Schools, etc.	Somerset County Agricultural Assoc. Carlisle Corporation Leisham Borough Council do. Grimsby Corporation Ebbw Vale U.D.C. Beckenham U.D.C. The Governors Great Western Railway Co. Commissioners H.M. Works Arbroath Corporation do. Royston U.D.C. Staffordshire Education Committee Thames Valley & Goring Water Co. C.B. of West Ham Twickenham U.D.C. Southend-on-Sea Corporation Working District Gas Co. do. Secretary of State for India Bury & District Joint Water Board do. Hornsey T.C. Leicester Corporation Crown Agents for the Colonies do. Dr. McWilliam Messrs. D. Lubelski & Sons, Ltd. do. Mr. P. McGinness Mr. J. Wrigley, J.P. Stepney Guardians Manchester Corporation Walthamstow Education Committee	A. B. Cotton, Surveyor, Bridgwater H. C. Marks, City Engineer, 36, Fisher-street, Carlisle Town Hall (Surveyor's Department), Catford, S.E. do. H. G. Whyatt, Borough Engineer, Town Hall, Grimsby G. F. Deacon, Engineer, 16, Great George-st, Westminster, S.W. Connell's Surveyor, Beckenham D. J. Lougher, Architect, Bank-chambers, Pontypool Jarvis & Richards, Architects, 36, Victoria-street, S.W. Engineer at Neath Station H.M. Office of Works, Storey's Gate, S.W. Crouch & Hogg, Engineers, 68, Bothwell-street, Glasgow do. T. W. Wills, Surveyor, Town Hall, Royston G. Balfour, Director of Education, Office of Educa. Com., Stafford Office of Company, 20, Bucklersbury, E.C. Borough Engineer's Office, Town Hall, Stratford, E. Council's Surveyor, Town Hall, Twickenham R. J. Elford, Borough Engineer, Southend W. A. Valon & Son, 140, Temple-chambers, London, E.C. do. Director-General of Stores, India Office, Whitehall, S.W. J. Cartwright, Engineer, Peel-chambers, Bury, Lancashire do. Borough Engineer, 99, Southwood-lane, Highgate, N. E. G. Mawbey, Borough Engineer, Town Hall, Leicester The Office of the Crown Agents, Whitehall Gardens, S.W. W. Baird & Co., Ltd., Bothwell Collieries, Bothwell E. Whitlock, Architect, 26, Scale-lane, Hull A. Neill Son, Architects, 35, Park-row, Leeds J. Robertson, Architect, 39, Union-street, Inverness do. C. M'Alister, Architect, 26, Chichester-street, Belfast Mr. J. Wrigley, J.P. J. & W. Clarkson, 130, High-street, Poplar, E. City Surveyor, Town Hall, Manchester H. Prosser, Architect, High-street, Walthamstow	Feb. 3 Feb. 4 Feb. 6 do. do. Feb. 7 do. do. Feb. 8 do. Feb. 9 do. do. Feb. 10 Feb. 11 Feb. 14 Feb. 18 do. Feb. 29 Feb. 23 April 10 No date. do. do. do. do. do. do. do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Clerk of Works	Greenwich Borough Council	44. per week	Jan. 27

Those marked with an (*) are advertised in this number.

Competitions, iv.

Contracts, iv. vi. viii. x.

Public Appointments, xvii.

TENDERS.—Continued from page 75.

ASHHAM.—For additions to the Manor House, Ashham, Norfolk. Messrs. Morgan & Buckingham, architects, Norwich. W. & H. Wade..... £111 15 6 T. H. Blyth, Foulsham*..... 111 12 0	GILFACH BARROED (Wales).—For the erection of seventeen houses, for the Park Place Building Club. Mr. Wm. Harris, architect, Gilfach, Pengam:— E. Edwards, Park-place, Gilfach, Pengam, Glam.*..... £2,470 0	LONDON.—For detached residence and stalling, Hendon-avenue, Finchley, N., for Mr. J. E. Arnold. Messrs. Bennett & Richardson, architects, Broadway, Finchley. Quantities by architects:— G. Godson & Sons..... £2,564 A. Quibell..... 2,640 F. Gough & Co. 2,634 Mattock & Parsons..... 2,617 Patman & Fotheringham..... £2,593 Chapman, Bros..... 2,590 W. Lawrence & Son..... 2,549 H. C. Clifton..... 2,542 J. Phoenix*..... 2,540
BARNESLEY.—For street works, Boundary-street and part of Gold-street, for the Town Council. Mr. J. H. Taylor, Borough Surveyor, Manor House, Barnesley:— Part of Gold-street. J. Hood, Peel-street, Barnesley*..... £408 Boundary-street. J. Hood, Peel-street, Barnesley*..... 389	GRAY'S THURROCK.—For 270 lineal yds. of wrought-iron fencing and a pair of gates, for the Urban District Council. Mr. A. C. James, Surveyor, High-street, Grays:— Bayliss, Jones, & Bayliss, 6 7 6 gates. Wolverhampton*..... 1 0 0 each for posts.	LONDON.—For enlargement of Eastern District Post Office:— Credit Old Materials. Multon & Wallis..... £23,900 0 0 J. F. Holliday..... 23,871 0 0 W. King & Son..... 23,700 0 0 Simpson & Co..... 23,400 0 0 J. Mowlem & Co., Ltd. 23,000 0 0 General Builders, Ltd. 22,497 0 0 Foster Brothers..... 22,380 0 0 W. H. Lorden & Son..... 22,138 0 0 H. J. Williams, Ltd. 22,100 0 0 L. H. & R. Roberts..... 21,977 0 0 Leslie & Co., Ltd. 21,942 0 0 W. Johnson & Co., Ltd. 21,932 0 0 W. Gladding & Co..... 21,699 0 0 Martin, Wells, & Co., Ltd. 21,580 0 0 F. & A. Willmott..... 21,274 0 0 Higgs & Hill, Ltd. 21,163 0 0 J. Smith & Sons, Ltd. 20,870 0 0 Edwards & Medway..... 20,580 0 0 F. & T. Thorne..... 20,509 17 9 J. Shalbourne & Co. 19,782 0 0 B. E. Nightingale..... 19,745 0 0 Perry Brothers..... 19,657 0 0 J. Garrett & Son..... 19,066 0 0
BILLINGFORD.—For alterations to the Billington Hall, Norfolk. Messrs. Morgan & Buckingham, architects, Norwich:— W. Lamer..... £182 3 0 T. H. Blyth, Foulsham*..... 175 10 6 T. H. Blyth & Son 180 0 0	LYFORD.—For laying granite channelling and making-up roadway on the south side of Green-lane, for the Urban District Council. Mr. H. Shaw, Surveyor, Town Hall, Ilford:— Parsons & Parsons, Ilford Wharf*..... £507 1 11	LONDON.—For detached residence in Hendon-avenue, Finchley, for Mr. Edwin Pringle. Messrs. Bennett & Richardson, architects, Broadway, Finchley. Quantities by architects:— W. Tont..... £1,374 W. G. Larks & Sons..... 1,223 Patman & Fotheringham..... 1,186 H. C. Clifton..... 1,154 C. F. Day..... 1,104 W. Lawrence & Son*..... 1,074 J. Phoenix..... 1,060
COLORNESTER.—For road works, Constantine-road, Malden-road, for the trustees of the late G. H. Errington. Messrs. Baker & May, surveyors, Head-street, Colchester:— G. Burgoine..... £1,134 G. Dobson & Son..... 1,080 H. Everett & Son..... 837 W. Howard & Son 820	KINGSTEIGNTON.—For a masonry reservoir to contain 85,000 gallons; and 900 ft. of 4-in. cast-iron water mains, for the Newton Abbot Rural District Council. Mr. Samuel Segar, engineer, Union-street, Newton Abbot:— M. Callender & Co., Ltd. £1,288 0 0 Petrick Bros. 1,229 0 0 H. M. Patrick 1,089 0 0 J. G. Porter 1,084 0 0 S. Howe..... 1,047 7 0 B. Pike..... 988 15 6	LONDON.—For detached residence in Hendon-avenue, Finchley, for Mrs. J. A. Tunstall. Messrs. Bennett & Richardson, architects, Broadway, Finchley. Quantities by architects:— W. Tont..... £1,908 W. G. Larks & Sons..... 1,897 G. Godson & Sons..... 1,847 Patman & Fotheringham..... 1,823 Ingham..... 1,793 Sheffield Bros..... 1,781 F. Gough & Co. 1,781
COLTON.—For constructing a new road near Rusland Hall, Colton, for the Uxbridge Rural District Council. Mr. W. F. J. Molins, surveyor:— T. Lourtie..... £229 0 0 W. Waite..... 200 12 8 T. & W. Dirkin 290 4 7 T. Idon..... 222 0 0	NEWTON.—For making-up and paving part of Hamlet-gardens and Ormiston-road, for the Borough Council of Hammersmith. Mr. H. Mair, Borough Surveyor, Town Hall, Broadway, Hammersmith:— Hamlet-Ormiston-road. H. Finnis..... £281 H. J. Greenham, Fulham*..... 229 Kavanagh & Co..... 275 Mowlem & Co..... 272 Nowell & Co..... 285 Rogers & Co..... 297 Martin, Wells, & Co. 290 Wimpey & Co..... 280	LONDON.—For detached residence in Hendon-avenue, Finchley, for Mrs. J. A. Tunstall. Messrs. Bennett & Richardson, architects, Broadway, Finchley. Quantities by architects:— W. Tont..... £1,908 W. G. Larks & Sons..... 1,897 G. Godson & Sons..... 1,847 Patman & Fotheringham..... 1,823 Ingham..... 1,793 Sheffield Bros..... 1,781 F. Gough & Co. 1,781
COWPEN.—For 1,200 lineal yds. of Whinstone kerb in Morph-street and Hodgson-lane, for the Cowpen Urban District Council. Mr. E. Grieves, Surveyor to Council, Cowpen:— J. Robson, Newcastle-on-Tyne*..... £205	EVESHAM.—For 4,500 yds. of stoneware pipe sewers (broadway sewerage), for the Rural District Council. Messrs. R. & W. Berrington & Son, engineers, Wolverhampton:— T. J. Mason £3,915 13 2 J. Dickson..... 3,789 4 8 E. Play & Co., Ltd. 3,652 11 2 J. Riley..... 3,554 15 7 T. Frost & Co. 3,550 0 0 Curral, Ellis, & Martin, Ltd. 3,532 7 7 M. Low..... 3,518 0 0 J. A. Mire..... 3,430 0 0 Vale & Sons, Ltd. 3,200 0 0	LONDON.—For detached residence in Hendon-avenue, Finchley, for Mrs. J. A. Tunstall. Messrs. Bennett & Richardson, architects, Broadway, Finchley. Quantities by architects:— W. Tont..... £1,908 W. G. Larks & Sons..... 1,897 G. Godson & Sons..... 1,847 Patman & Fotheringham..... 1,823 Ingham..... 1,793 Sheffield Bros..... 1,781 F. Gough & Co. 1,781

MANCHESTER.—For a new laundry at Longsight, Manchester. Messrs. Maxwell & Tuke, architects, 25, Brazenose-street, Manchester:—
J. & J. Parsh £3,150
Daniels 2,145
Roberts & Son 3,110
J. Bland 3,085
W. Peters & Son 3,075

MENSTON.—For erecting five houses and shop, for Mr. James Cole, Esq., W. H. Sharp, architect, 239, Rooley-lane, Bradford:—
Masons: S. Mounsey & Son, Guiseley* £755
Joiners: Thompson Bros., Bradford* .. 345
Plumber: J. H. Clapham, Bradford* 196
Plasterers: Walsh Bros., Guiseley* 95
Slaters: R. & L. Nelson, Ulfley* 83
Painter: J. Bunting, Guiseley* 25

MERTHYR.—For sewer works, for the Merthyr and Aberdare Joint Farms Management Committee. Mr. T. E. Harvey, Engineer and Surveyor, Town Hall, Merthyr:—
J. E. Howells £663 11 0
E. Davies 504 15 6
Cooper & Wilkins 427 3 0
J. Sutherland 392 10 0
J. W. Eek 385 7 6
A. G. Collins & Co. £380 9 2
D. Jones 359 0 7
R. Webb 356 3 3
H. Ringham 318 5 7
W. Brown 305 17 0
Booth & Sons, Merthyr* .. 305 17 0

NORWICH.—For the erection of house on Newmarket-road, for Mr. A. Banister. Messrs. Morgan & Buckingham, architects, Norwich:—
J. Holmes £1,588 0 0
J. S. Smith 1,385 0 0
T. Gill 1,249 0 0
S. W. Utting £1,217 0 0
J. Evans* 1,171 10 0
[All of Norwich.]

NORWICH.—For the erection of water-closets and urinals, and for the conversion of earth closets into water-closets, for the Norwich Board of Guardians. Messrs. Morgan & Buckingham, architects, Norwich:—
J. J. Howes, Norwich* £325

RADSTOCK (Somersetshire).—For main sewerage and sewage disposal. Radstock, near Bath, for the Urban District Council. Messrs. D. Balfour & Son, engineers, 1, Victoria-street, Westminster, S.W.:—

	Per cubic yd.	s. d.
S. W. Harrison & Co.	£9 840 0 0	10 0
S. Wood	9,830 11 11	3 0
Johnson Bros.	9,640 0 0	5 6
R. H. B. Neal	9,605 0 0	3 0
J. T. Buns	8,900 0 0	19 0
Moran & Son	8,900 0 0	5 0
J. Jackson	8,888 0 2	1 9
J. & M. Patrick	8,409 0 0	6 0
G. Downs & Son	8,300 0 0	18 0
E. Powell	8,272 18 0	3 0
Parkins & Son	8,100 0 0	20 0
Thatcher Bros.	8,031 7 5	20 0
E. Ireland	7,900 0 0	10 0
J. Byrom	7,650 0 0	10 0
J. Riley	7,609 7 9	5 6
J. Bird	7,600 0 0	3 6
G. Rutter	7,365 0 0	4 6
Free & Co.	7,364 4 4	12 6
T. Bell	7,250 0 0	7 0
W. Tison	7,000 0 0	2 6
Muirhead	6,618 18 2	3 0
Jameson, Birmingham*	6,325 0 0	3 0

ROTHERHAM.—For connecting properties with the main sewer in the parish of Catcliffe, for the Rural District Council. Mr. J. Flatts, Surveyor, High-street, Rotherham. Quantities by Surveyor:—
Thos. Green £391 0
Frank Egan 380 0
Nadlin & Darwent £371 0
J. Cooper, Rotherham* 356 14

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SCUNTHORPE.—For laying and jointing 6,880 lineal yds. of 8-in. and 9-in. mains (Bisby water), for the Urban District Council. Mr. A. M. Cobban, Engineer, Home-street, Scunthorpe:—
J. Sanger, Hull* £412 12 1
[Thirty-three tenders received: highest £1,687, lowest £412.]

SCUNTHORPE.—For laying and jointing about 12,700 lineal yds. of mains, etc., for the Urban District Council. Mr. A. M. Cobban, Engineer, Home-street, Scunthorpe:—
H. Ashley, Mansfield* £94
[Thirty-one tenders received: highest £2,217, lowest £94.]

SHALDON (Devon).—For erecting a dwelling-house at Riggmore, for Mr. J. Harvey. Mr. Samuel Segar, architect, 24 and 26, Union-street, Newton Abbott:—
T. T. Hayman £440 0 0
F. C. Francis 533 2 6
H. C. Goss 580 0 0
T. Mumford 499 0 0
E. Pike 577 10 0
A. C. Penwell 489 14 0
P. A. A. Shacey 575 0 0
H. G. Denley 481 10 1
Parker Bros. 530 0 0
E. E. Bulley 464 19 0
E. Andrews 534 1 10
T. Broad 450 0 0

SKIPTON.—For sewage tanks and bacterial filters, for the extension of Glusburn Sewage Disposal Works, for the Rural District Council. Mr. H. A. Johnson, engineer, 15, The Exchange, Bradford:—
W. Brigg, Eccleshill, Bradford* £932 17

SURBITON.—For making-up Bond, Douglas (part off, and Thornhill roads, for the Urban District Council:—

J. Mowlem & Co. £4,912 0 0
T. Free & Sons 4,575 0 0
F. Thacker. £4,500 0 0
Kavanagh & Co., Surbiton* 4,390 7 9

TREHARRIS.—For erecting a new infants' school, with boundary walls, etc., for the Merthyr Tydfil Urban District Council. Mr. J. Llewellyn Smith, architect, Central-chambers, 67 High-street, Merthyr Tydfil:—
T. F. Howells, Cardiff* £4,250

WHITFIELD.—For widening and reconstructing Crooked Bridge, for the Northumberland County Council. Mr. J. A. Bean, County Surveyor, The Moot Hall, Newcastle-on-Tyne:—

H. Richardson, Alston* £547 10
WOODHOUSE.—For erecting a church, etc., for the Primitive Methodist Connexion. Mr. J. P. Earle, architect, Norfolk-cove, Sheffield:—
J. E. Bates, Intake, Sheffield £1,058
[1st contract.]

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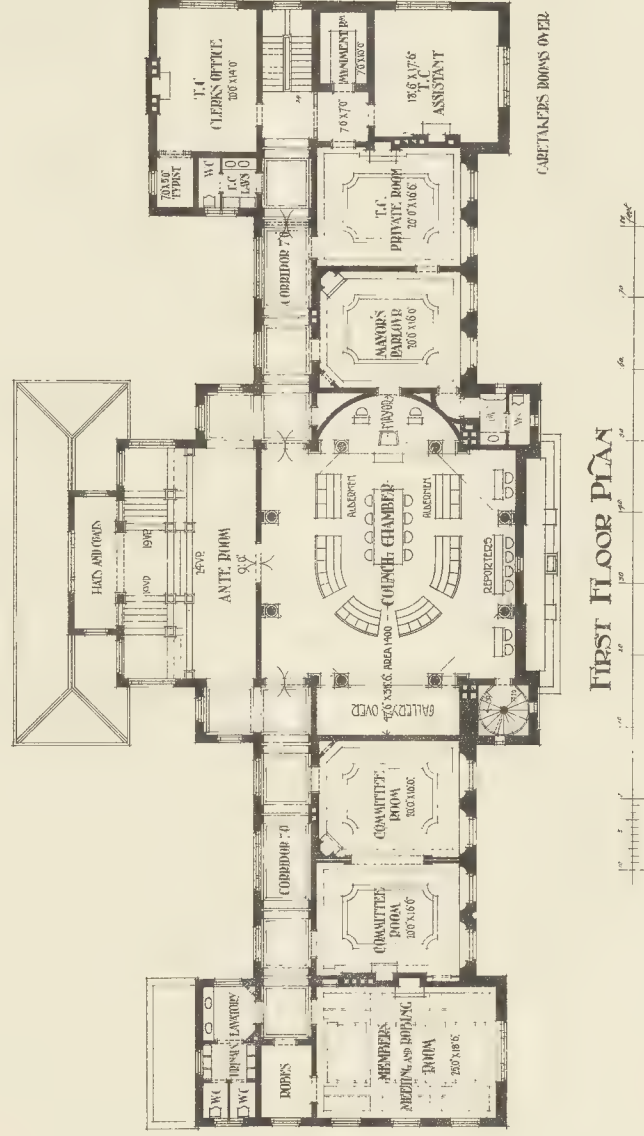
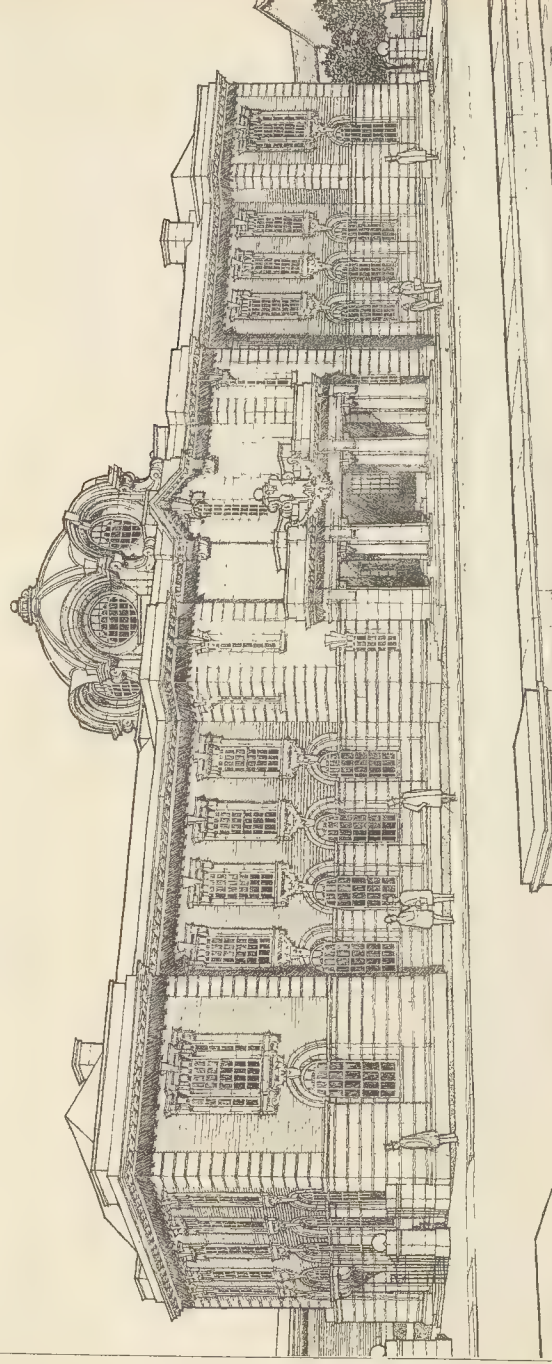
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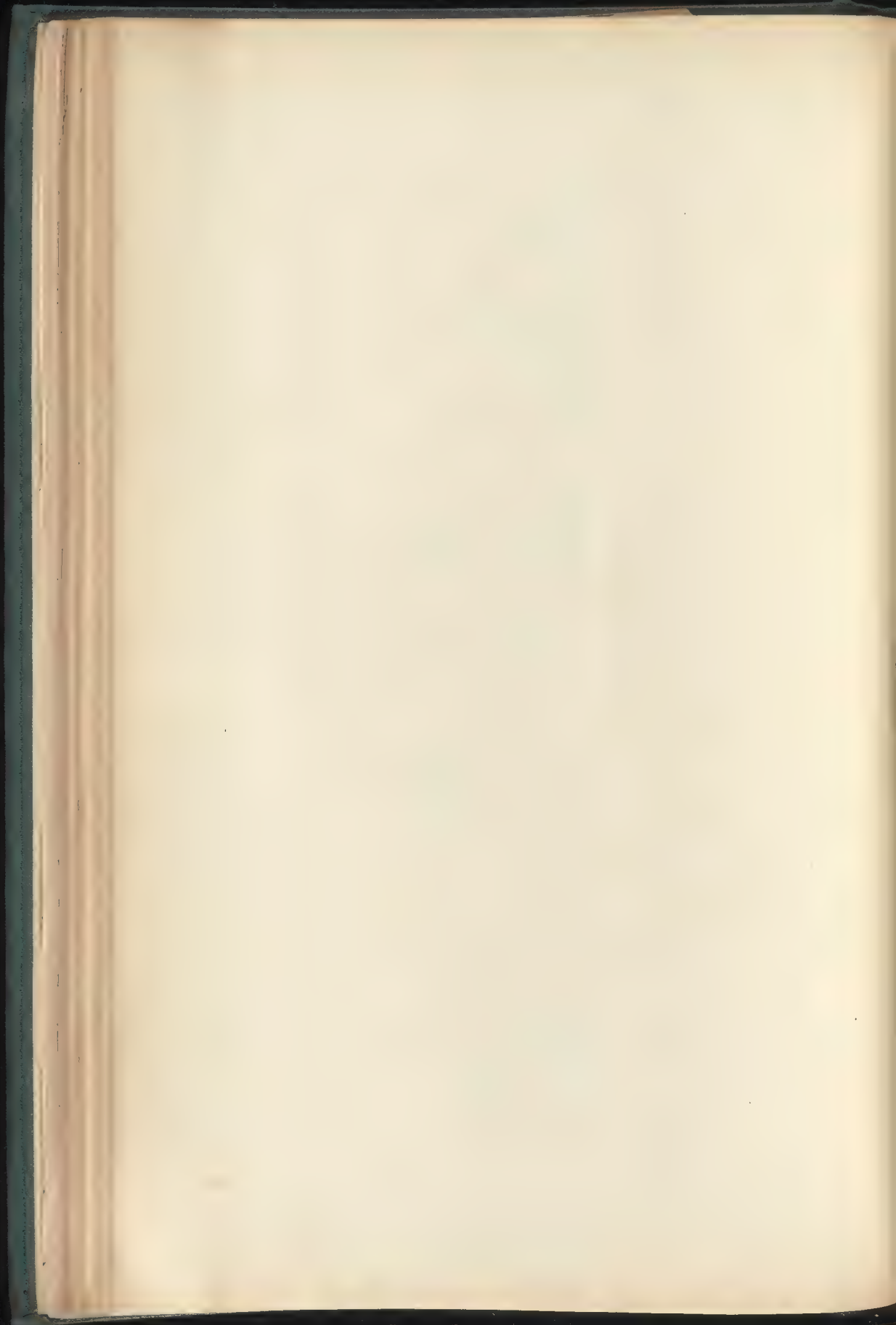
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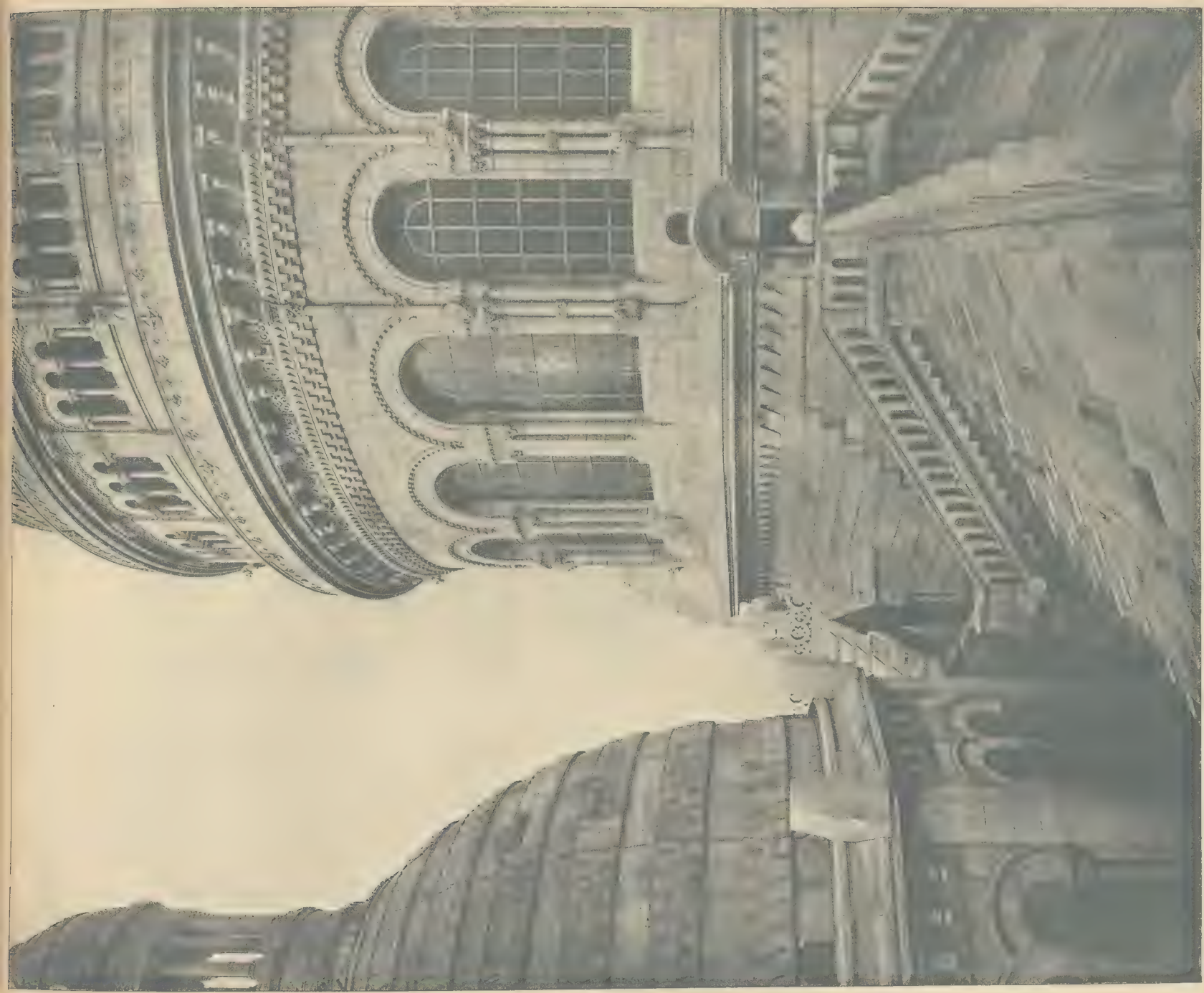
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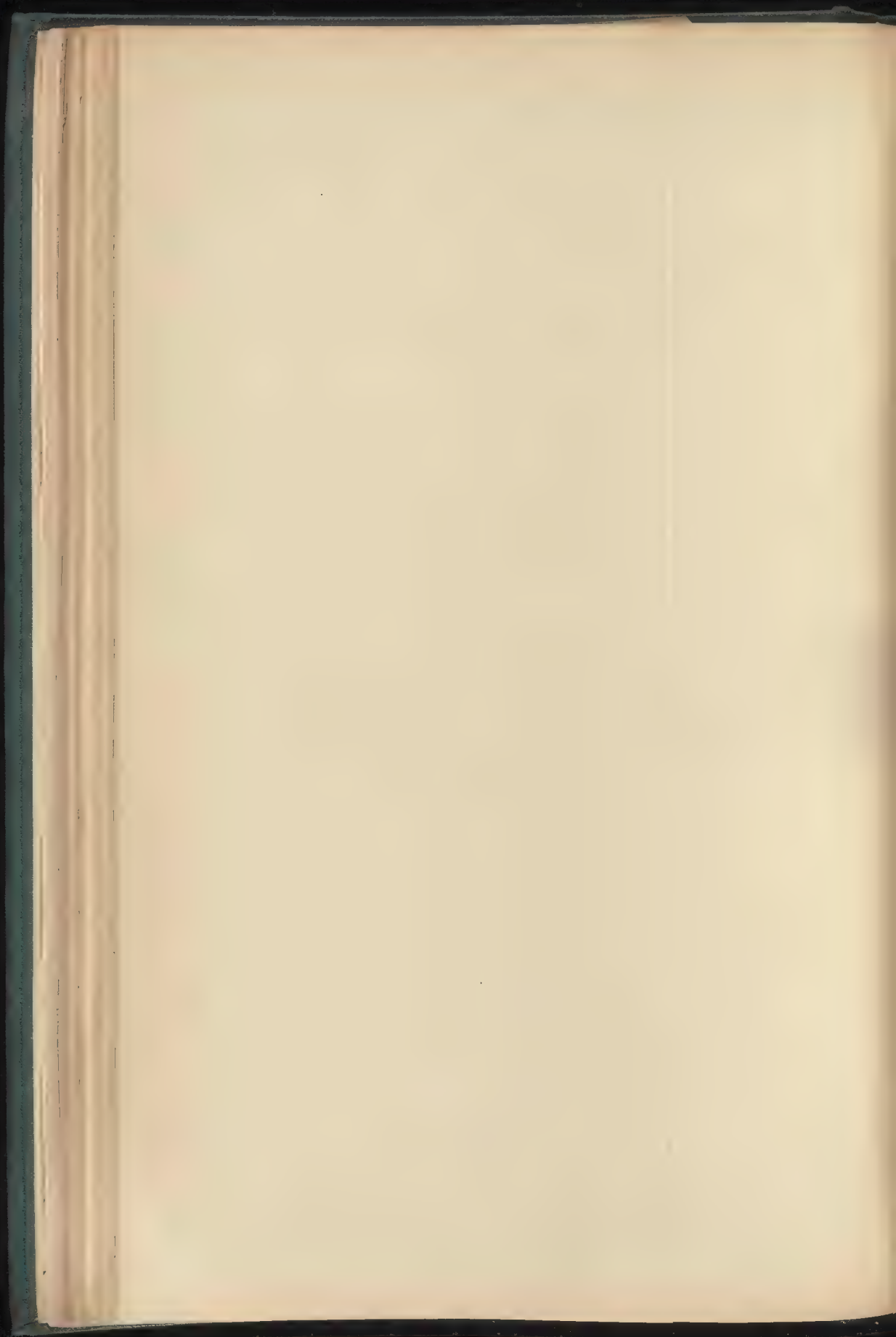
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The Builder.

VOL. LXXXVIII.—No. 3234.

JANUARY 23, 1905.

ILLUSTRATIONS.

Interior, York Minster } Drawn by Mr. J. B. Fulton,
Sketches from English Cathedrals }
University College Schools, Hampstead : First Premiated Design By Mr. Arnold Mitchell, F.R.I.B.A.
1. Elevations and Section.
2. Plans.


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Memorials of Burne-Jones.



T the time of Sir E. Burne-Jones's death we endeavoured to sum up briefly what appeared to us to be the essential qualities of his art, and the place it was likely to hold in the history of English painting.* Such a summary, though in that case it was the result of many years' observation and enjoyment (great, if not unmixed) of his pictures, could only be made in a tentative and suggestive manner. As Mr. Clausen truly said in the lecture reported on another page, it takes fifty years at least before the world can come to a settled judgment on works of art apart from the disturbing influences of contemporary taste or fashion, though those who are able to keep their thought out of the grooves in which art-criticism at present runs may have a right to think that they see a little more clearly on that account. Burne-Jones's artistic reputation was a peculiar one. He was idolised by a certain number of amateurs, but never understood or cared for much by the general public, to whose judgment he on his part was probably entirely indifferent. A late well-known nobleman, whose social extravaganzas were varied by fits of aestheticism, in a magazine article compared Burne-Jones with Wagner, intending the comparison as the greatest compliment he could

pay the painter. The coupling of the names of the quiet, retiring English painter and the robustious, self-asserting German, blowing trumpets about his own art all his life, seems absurd at first sight ; but there is something in it. Both drew their subjects from romance and neglected common human character ; both were great in colour and weak in form, for Wagner's mastery in orchestral effect corresponds with colour in painting, and his weakness in construction and melodic invention corresponds with Burne-Jones's weakness in drawing ; and both disliked the works of their contemporaries in art, with the difference that Wagner's was positive and noisy depreciation, Burne-Jones's was only a negative indifference, rather implied than expressed.

There was never anything of trumpet-blowing about Burne-Jones. He worked to satisfy his own ideals in art, and let the public take it or not as they pleased, and in this respect the biography* is quite in keeping with the character it commemorates. There is nothing of the exaggerated idolatry which is often the weak point of a biography of an eminent man written by his widow. The story of his life is quietly told, without any obtrusion of personal feeling ; it is perhaps a little lengthy, though it cannot be said that any part of it is uninteresting. What disappoints us somewhat is that it does not throw much light on Burne-Jones's views about art, or the reasons which led him to develop the special character of subject and treat-

ment which is associated with his name ; we get a hint once or twice from an occasional remark, but not more than that. As to any analysis of his art and its objects, no doubt his biographer felt that she was not called on to attempt anything of the kind.

The history of the artist's childhood and youth is curious in respect to the utter contrast of his surroundings with the kind of work which he was destined to do in the world. Born in the house of a tradesman in Bennett's Hill, Birmingham (his father was a carver and gilder), and having lost his mother, who did not long survive her confinement, he became the special care of a certain Miss Sampson, who performed the part of mother to him, and who appears to have been a most kindly and motherly soul, and as complete a Philistine in regard to art or culture as motherly souls often are. The father, in his grief for the mother's death, could for a time hardly endure the presence of the child, and it was an old friend of the mother's who, in compassion, called Miss Sampson to the rescue. The house is described as it was when the narrator, then sixteen, first saw it:—

"I recollect how destitute the house was of any visible thing that could appeal to imagination; chairs, carpets, tables, and table furniture each had its own place, and more commonplace than the other. The only objects I saw within those walls that had a touch of humanity in them were some framed pieces of needlework that looked like windows into another world, because it seemed as if someone had been interested and amused in their making. Amongst the pictures were two animals—one a lion, the other a face like a man, with a handsome aquiline nose—the other, I believe, a tiger; also a smaller and finer piece of a girl mourning at a tomb, with a pendant which I forget. Over the mantelpiece and

* Memorials of Edward Burne-Jones. By G. B.-J.
London: Macmillan & Co. 1904.

above a hard-featured square clock was a picture of the church and graveyard of Snaith in Yorkshire, which bristled with gravestones as if it had been a city cemetery. Miss Sampson told us that these were the tombs of her relatives, represented there as altogether in order that the drawing might be kept within reasonable dimensions. Some pieces of old blue china, and the remnants of a Worcester dinner service copied from an Oriental pattern, were the only articles of household use that I remember that were not actually ugly.

It seems an extraordinary cradle for an artist who was to be the most anti-Philistine of painters; but perhaps it was the reaction against this kind of thing that, without his knowing it, led him to be so ready, a few years later, to join his friend Morris in a campaign against things ugly. The only thing related that points to his future vocation is that his great solace, from childish years, was drawing. He mentioned in after life to a friend that he thought this was what had most kept him up in the sadness of a childhood with no mother and a father who took little notice of him. But there was not an idea in his mind at that time of becoming painter. There seems to have been no attempt at any study of the art; he drew things out of his head partly for the amusement of his schoolfellows, and the verdict of the drawing master was—"might do better if he exhibited more industry." His ideal at this time was to be a clergyman. He took a great interest in his boyhood in questions of religious doctrine. There are two long letters written at the age of sixteen to a girl cousin, on the subject of the tenets of Arminians and Calvinists, and the true distinction between them. Still more incongruous seems the fact that he had a passion for practical joking, which seems to have survived his schoolboy days (one of the practical jokes of a later period was for all the guests one day at Morris's to join in boycotting their host at his own table, refusing to speak to him or take any notice of him), and some that are recorded are not remarkable either for wit or good taste, and might as well have been forgotten. Stranger still are the facsimiles of humorous sketches of this period; one of them a most amusing rough sketch of a three-decker pulpit with the rector, curate, and clerk in their respective strata. Who that looked at the pictures of the mature Burne-Jones could have suspected the original "Ned Jones," as his friends then called him, of being guilty of humorous sketches?

It was not till he was twenty-three that he resolved on becoming a painter; and that he did so seems to have been mainly due to the influence of Morris and Rossetti, the latter more especially. He said later in life "I quite hated painting when I was little"; the National Gallery, to which he had been duly taken, did not make any difference in this respect; "until I saw Rossetti's work and Fra Angelico's I never supposed that I liked painting. I hated the kind of stuff that was going on then." This seems to imply that there was something innate in his love for mystical and idealised subjects in painting, which only waited for the occasion to be called into life. One of the most interesting things in the biography is the impression we get from it of the extraordinary power and influence which Rossetti exercised on those with whom he came in contact. It is recognised now by most people who look upon art with

"considerate eyes" that the first enthusiasm about Rossetti's pictures was somewhat exaggerated; that they have defects both of technique and conception which his inspiration in colour could not atone for. But no one could read this part of the biography without coming to the conclusion that Rossetti himself was greater than his pictures; that he was a most extraordinary personality. To Burne-Jones, Morris, and others of his contemporaries, what Rossetti said was right, and was to be done, and there was no resisting or arguing against it. He was a nature on fire with zeal and enthusiasm. Very interesting and pleasing too are the glimpses we get of Morris in his young days. Later in life Morris became bigoted and one-sided in some ways and on some subjects; he mixed up politics with art in an unfortunate manner—*non hæc satis inter se conveniunt*; but there was nothing of this in the Morris of the Oxford days. All that we read of him here makes one love and admire him; and one can hardly imagine a more beautiful young man's countenance than that of Morris at the age of twenty-three, as given in the portrait here; a face that has all the vigour and life of youth, combined with an earnest and thoughtful expression, as of one with a serious purpose before him; such a countenance as gives presage of a noble life.

One cannot help feeling, however, that throughout the book we move within rather a limited circle; we only meet the ideas and the records of what might be called a clique (not in the disagreeable sense of the word) of artists who had a private ideal of their own, and to whom everything and everybody outside of that ideal were unworthy of consideration; almost indeed ignored. But one architect is worth mention, he who built Morris's house at Upton, which Rossetti described in his impassioned manner as "a most noble work in every way, and more a poem than a house." We have never seen the house, but the sketch of it given as one of the illustrations shows nothing to justify such raptures; it is a pleasing re-creation of the aspect of an old English farmhouse. With Morris, in later life, this detachment intensified into a pessimism in the light of which everybody and everything in the world was wrong except himself, Ruskin, and Burne-Jones. And in the attitude of the latter towards contemporary art and towards the Academy we see the same feeling, though less intensified and outspoken.

The two influences that mainly formed Burne-Jones as a painter, and gave him belief in himself and in following out his own independent line in art, were evidently Italy and Rossetti. His biographer says that during his first visit to Italy in 1859 "the cities that he saw and the pictures in them were such a fulfilment of his desire and such a revelation of what man could achieve that he ceased to be afraid of failure for himself. Many a time I have heard him say that nothing disheartened or took the life out of him so much as looking at bad work, but that the best was always inspiring and life-giving." And at an earlier period, speaking of Rossetti's influence on him, he is quoted as saying:—

"He taught me to have no fear or shame of

my own ideas, to design perpetually, to seek popularity, to be altogether myself. . . . What I chiefly gained from him was not to be afraid of myself, but to do the thing I liked most, but in those first years I never wanted to think but as he thought, and all that he did and said fitted me through and through. He never harangued or persuaded, but had a gift of saying things authoritatively and not as the Scribes such as I have never heard in any man."

And for one who wished to make painting a high calling and not a mere means of living or getting a reputation there could have been, as far as it went, no better influence and advice; but did it not want tempering with something else, more prosaic certainly—advice as to the need of technical mastery of the figure? This would hardly have come from Rossetti, since he was practically indifferent to it himself. No painter ever worked harder at his art than Burne-Jones; the immense number of beautiful and highly-finished drawings and studies from his hand, independently of the pictures, is proof enough of that, as well as the chaffing testimony of Rossetti, that Jones was the most indolent man he knew—"when once you sit down to work you are too lazy even to get up again." When he gave evidence for Ruskin in the *cause célèbre* of "Whistler v. Ruskin," he said, "I think that nothing but perfect finish ought to be allowed by artists; that they should not be content with anything that falls short of what the age acknowledges as essential to perfect work"; and he characterised the "Nocturne in Blue and Silver" as "an admirable beginning," but which in no sense whatever showed the finish of a complete work of art.* As to the painstaking finish of his own work, his biographer remarks that the moment of pronouncing one of his pictures finished was only the moment when the work arrived which was to take it away. Yet with all this one cannot help being a little reminded of his school drawing-master's verdict quoted above—"Might do better if he exhibited more industry"—in a certain sense, that is. Taking to the art of painting at an age when most men who mean to be painters in earnest have already gone through a severe training in figure drawing and anatomy, there seems hardly any evidence that he appreciated any more than Rossetti, the necessity of such training. There is a passing reference to attendance at some life classes, but it does not seem to have lasted very long, and it is an unquestionable fact that his early pictures showed sometimes very bad drawing indeed; in the later ones a life's practice had made a difference, and when he introduced figures into heads high, one may assume that he was quite aware that they were unlike nature, and chose to have them so, just as he must have been aware that in "The Golden Stair" he contradicted all the facts of perspective in making the rear figures as tall as the foreground ones in order to get a better decorative effect. That of course is a convention in painting for which there are plenty of examples in the work of great artists. But as to the matter of drawing, is not correct and

* Considering Burne-Jones's attitude of antagonism to the Royal Academy, it is worth note that this almost exactly the criticism which the present President of the Academy pronounced on Whistler, at a recent Royal Academy dinner, to the effect that the deceased artist had left as a legacy "the art of leaving out where the difficulties begin."

masterly figure-drawing one of the qualities which "the age acknowledges as essential to perfect work"?

The advice and influence of Rossetti, in fact, was inspiring but narrowing. There was a painter who had never cared for painting till he saw the works of Fra Angelico and of Rossetti—odd names to mingle, but both marked by mystical beauty and significance accompanied by imperfect technique. There was nothing to counteract the influence, and the result on an ardent and imaginative mind was the earnest following out of a mystical school of art in which ideals counted for everything, and nature and the higher craftsmanship were altogether secondary. His art is a world in itself, a beautiful and suggestive world; but it is one in which we see nature as through a stained glass window. Probably he would have said that was just what he intended; his object was to make painting solely the expression of an ideal. The representation of real life in painting he seems to have shrunk from. In a letter of his that we have seen somewhere (it is not inserted in the biography), he satirically said to a friend that he thought of painting a picture of a stout city man reposing, with a newspaper in his hand, on a gilded sofa of early Victorian type; he supposed that was what the public would like. The public (of this country) are stupid enough about art, but to imply that there is no medium between allegorical figures and such a subject as that only shows a narrow judgment. It would be interesting to know what Burne-Jones thought of Velasquez; the name does not occur in the biography. In regard to the fact that all his faces seem to be alike, and though beautiful, to have one expression, or rather no expression, a light is thrown on this by the remark quoted in regard to his design for the three Queens mourning over Arthur—"They are queens of an undying mystery, their names are Lamentation and Mourning and Woe. A little more expression and they would be neither queens, nor mysteries, nor symbols, but just—not to mention baser names in their presence—Augusta, Esmeralda, and Dolores, considerably overcome by a recent domestic bereavement." That is an intelligible argument, and there is something in it, but we are rather convinced of the difficulty than of the impossibility of the task. One painter at all events has shown that it is possible, in an ideal composition, to give the most striking variety of character to different figures and yet keep them all on the plane of a great monumental style. But his name was Michelangelo.

The story of Burne-Jones's election to and withdrawal from the Royal Academy, which is told at some length, is, we think, more creditable to the Academy than to him. The invitation to him to become a member, if it were partly prompted by a desire to secure to the Academy a painter of fame, was at any rate made in a very complimentary manner. After making a favour of joining, he exhibited one picture only, "The Depths of the Sea," which, coupled with the verse attached to it, was pretty obviously a satire on the Academy, though we do not imagine that they realised this at the time; he ignored the Academy exhibitions alto-

gether afterwards, and then withdrew in dudgeon because he had not been elected a full R.A. We cannot see that, under the circumstances, he had a right to expect it; and considering that the Academy at that time included in its ranks Millais, Watts, and Leighton, of whom the two first were certainly greater painters than himself, and the third at all events a much greater master of drawing and with a higher perception of style, his attitude seems to us quite unjustifiable.

We are not for a moment questioning that Burne-Jones was a great painter, one of the most remarkable that modern England (we might say modern Europe) has produced; but we think he had limitations which were not perceived either by himself or his friends. He has added much, however, to our store of suggestions of beauty, and he followed a high aim in all he did. As a piece of symbolical Christian art perhaps nothing more beautiful and pathetic has ever been done, even by the early Italians whose work he admired so much, than the design of the "Tree of Life" made for the American church at Rome—beautiful both in a moral and in a decorative sense.

We might say much about the personal traits recorded in the biography, but we are naturally concerned here mainly with the artistic side of it. Burne-Jones's politics seem to have been of a crude and rather violent and unpatriotic character, but we are interested to find that he had a juster appreciation of Napoleon than most Englishmen seem equal to. There are many opinions and sayings of himself and others on life and art and literature which are interesting and suggestive, but none more so than his comprehensive remark, *à propos* of the wanton slaughter of animals in "sport"—"Teach children to draw animals, and they won't wish to kill them."

Though unable to regard Burne-Jones's art as all that some take it to be, we have read this record of his life with much interest and sympathy. It has been written by the right person, for the reason indicated by the painter himself in a conversation on the subject with his wife—"For you know"; but there is no attempt to force upon the reader any special view of the artist or his art—it is simply a record; and the references to such serious circumstances as their engagement and his death, in their combination of reticence of language with indication of deep feeling, could be read (we hope) by no one without sympathy and emotion.

WAREHAM CHURCH, DORSET.—A four-light transome window has just been executed and placed in Wareham Church by Messrs. Percy Bacon & Brothers, of London. The subjects, which are of a pictorial nature, are the "Prodigal Son," "Good Samaritan," "Lose Sheep," and the "Lost Piece of Silver." This is the third window executed by Messrs. Bacon for this church.

PRIMITIVE METHODIST CHURCH AND SCHOOL, STAVELEY, DERBYSHIRE.—The Staveley Primitive Methodist church and school, which were burnt down at the beginning of last year, have been rebuilt, and were opened a short time ago. The new buildings have been erected at a total cost of about 2,000l. The architects were Messrs. W. J. Morley & Son, of Bradford and London, and Messrs. T. Lee & Son, of Staveley, were the builders, and Messrs. Lund & Swann, of Eckington, the joiners, etc. The heating apparatus was installed by Messrs. Wright Brothers, of Sheffield, and the leaded lights were put in by Mr. W. Blythe, of Bradford.

NOTES.

Architects
and the Law.

We may draw the attention of the Council of the Institute of Architects to the report of the case of Tarring v. Aldridge, in our legal column, in the course of which there occurred the usual expressions of contempt and almost insult in regard to the representative body of the architectural profession, which have become customary in courts of law. The plaintiff said that his charges were in accordance with the scale of the Institute of Architects, on which the counsel on the other side "protested in the name of the public against a small body sitting in a room and making out a scale which they sought to impose on the public." Lawyers, we suppose, do not seek to impose any scale of charges. The judge of course supported this, and directed the jury that they were at liberty to disregard the Institute scale of charges. There is no other liberal profession in England which is exposed to this kind of habitual contemptuous treatment in courts of law. The Institute may have been mistaken in not seeking a legal recognition of their charges, but they at least have a right to be treated with respect.

The Late
Mr. Blashill.

We have to record in our obituary column the death of Mr. Thomas Blashill, for many years architect first to the Metropolitan Board of Works and afterwards to the London County Council, an appointment for which he was selected out of a great number of candidates, and for which he had some peculiar qualifications, possessing exceptional practical knowledge of materials, and a great capacity for business administration; and there is no doubt that the building business, or the Building Act business, of the County Council, was conducted by him with great ability. If he was not an enthusiast in regard to the artistic side of architecture, it may be said that the County Council did not specially ask for such a quality in their architect, and would possibly have felt embarrassed by it rather than otherwise. Mr. Blashill was much interested in the planning of artisans' dwellings, on which he read an admirable paper, which was printed, with some illustrative plans, in our issue of February 17, 1900. He was also interested in archaeological questions, on some of which he had a good deal of out-of-the-way information, and in some subjects connected with natural history. Mr. Blashill was a man of genial and sincere temperament and manners, and was liked by all who had to do with him, except perhaps those who tried to get some uncalculated-for concession from the County Council in regard to a building line.

The
Light and Air
Question.

The judgment of Mr. Justice Bray in the case of Ambler v. Gordon, reported in our last and present issue, deserves to be carefully noted. It may be considered as a supplement to or gloss on the celebrated decision in the Colls' case, as it is now named. The question which the judge had to decide was whether, under the decision in Colls' case, the owner of the dominant tenement was entitled to an extraordinary amount of light for a

special purpose after such amount had been enjoyed for twenty years. This point Mr. Justice Bray decided in the negative, and having regard to the judgment of the House of Lords this legal result appears inevitable. The basis of that decision was that, in order to give ground for an action by the owner of the dominant tenement, he must show such an amount of deprivation of light as to amount to a legal nuisance. It is obvious, however, that if sufficient light is left for general and ordinary purposes, but not enough for extraordinary, a nuisance, in the legal sense, does not exist. Again, as Mr. Justice Bray acutely pointed out, the legal basis of the right to light has often been stated, especially in old decisions, to be based on the fiction of a lost grant. But how could there be a grant in bygone days to an extraordinary amount of light used in modern times for a modern business or trade? Thus this case exemplifies the remarkable simplification of this branch of English law which has been created by Colls' case, and how far-reaching and, indeed, increasingly important it is.

Our Neglected Waterways.

AN illustration of the manner in which navigable waterways are neglected in this country is afforded by the present plight of the River Ivel, which flows into the Ouse at Tempsford, in Bedfordshire. About a century ago this stream was canalised by the Ivel Navigation Company. Being in communication with the sea by means of the Ouse, the waterway was largely employed for the conveyance of coal and merchandise to and from the several towns, villages, and flour mills along its course, and until the advent of railways was the only means used for the transport of coal. Subsequently, the company was wound up by Act of Parliament, all rights of navigation and lands taken for towing-paths being surrendered. Since then the river has been neglected absolutely; its bed is gradually silting up, and weeds have grown in some reaches so that even a rowing boat cannot pass. Accumulations of silt have enabled property owners to enlarge their fields and narrow the channel by the reclamation of land, and one arch of Gifford Bridge, near Sandy, is completely blocked, the inevitable result being the flooding of large areas during rainy weather. A curious point is that no one seems to be responsible for the control of the river. The Urban District Council have at last discovered the undesirable conditions which exist, but, believing they have no jurisdiction, are urging the County Council to take the measures necessary for flood prevention. We do not know what the County Council will say, but, judging from past experience of similar bodies, we imagine they also will disclaim responsibility.

Reinforced Concrete in Europe.

CONCRETE reinforced by iron was used in England and America long before the peculiar advantages of the combination were known, and quite fifty years before reinforced concrete was applied on the Continent. Nevertheless, it was left to a simple gardener, Monier, of Paris, to discover the valuable properties developed

by the incorporation of wire netting with concrete. Thus, as Mr. Probst, of Vienna, points out in a paper read before the Western Society of Engineers (U.S.A.), "the fatherland of reinforced concrete is undoubtedly France." This paper traces the development of the material in Europe, a division of the world in which the author does not include the United Kingdom. One interesting circumstance mentioned is that the use of ferro-concrete in Belgium was introduced by an architect to meet the requirements of a "fireproof" residence. Another proof of the readiness exhibited by Continental architects to free themselves from the trammels of conventional methods is afforded by M. Visintini, who has made extensive use of lattice beams in reinforced concrete for floor and bridge construction in Switzerland, Austria, and Germany. Architects are not always behind the times as some people suggest.

The Weight of a Crowd.

CONTINUING the discussion of a paper on "The Structural Design of Buildings" before the American Society of Civil Engineers, Professor Johnson has pointed out by letter that the weight of a crowd of people is frequently under-estimated, and at the same time he sent a series of six photographs, which are reproduced in the Proceedings for December, 1904, showing crowds of different densities, varying in weight from 41.5 lb. to 154.2 lb. per sq. ft. The views were obtained by placing different numbers of the writer's students in a square box constructed for the purpose and standing upon a weighing machine. This chamber was 6 ft. square, inside measurement, with vertical walls 5 ft. 9 in. high and without a top. The camera was at a window about 20 ft. above the box, and the photographs were taken when certain weights were recorded by the machine. The maximum weight of 154.2 lb. per sq. ft. was attained without selection of the men or undue crowding, and as a matter of fact some of the students taking part in the experiment expressed their opinion that the congestion upon a bridge giving access to the university football field was sometimes considerably greater. As several short men are represented in the photographs, it is clear that 160 lb. per sq. ft. might easily be attained on occasion. Adding an equal amount for vibration due to movement of the crowd, we have 320 lb. per sq. ft. as a factor for calculating the strength of a floor. The results ascertained by Professor Johnson are not altogether new, but the collapses of floors and temporary structures which take place from time to time indicate that very inadequate allowance is often made for the exceptionally heavy live loads and vibratory stresses to which they may be subjected on special occasions.

American Power Station Engines.

THE author of a paper read at the Institution of Mechanical Engineers describes the engines at two of the large power stations in New York, namely, the Manhattan Power House and the Rapid Transit Power House. Apart from the magnitude of these stations, the most interesting feature is to be found in the new type of engine adopted, which is a compromise

between the horizontal and vertical types, and has been termed the "Manhattan" engine because it was first introduced at the power house of that name. It is believed by American engineers that this type is unequalled for its special purpose, occupying little space, possessing evenness of turn, effort, being accessible for repairs, and showing no undue or unequal wear in the cylinders owing to their vertical position. The engines inspected by the author at the St. Louis Exhibition were somewhat disappointing, and, judging from his paper, it seems that the engineering section of the exhibition fell below that of the Paris Exhibition of 1900, where the machinery was a far better representation of the general engineering practice of the world.

The Late Mr. Boughton.

ONE must regret the momentary sudden death of Mr. G. H. Boughton, who succumbed last week to a crisis of heart disease, since he had evidently during the last year or two been meditating a new departure in his art, which he has only had opportunity to show on the commencement of. For a good many years his work had been mainly confined to pictures of Puritans or Puritan maidens in the snow; the latter were always very pretty, and there was a completeness of style about these works which was satisfying, though a little tinged with mannerism; still, one felt that the programme suffered from repetition. His picture, "By the dark waters of Forgetfulness," in the Academy two or three years ago, was an evident attempt to break new ground with a poetic and imaginative subject, and was a pathetic figure, though still characterised by the cold colouring of the flesh which gave always a somewhat artificial appearance to his figures. One or two other works painted since then seemed to show that the Puritan maiden vein, worked a little too long, had been definitely abandoned, and one looked with interest to see what further developments would follow. He was a painter whose works, if not powerful, were at any rate always pleasant to look at.

Mr. Newton Bennett's Drawings.

MR. NEWTON BENNETT's second exhibition of water-colour drawings at the Society of Fine Arts is a great advance on his first one two or three years ago. That was an exhibition to be regarded with respect and recognition; the present exhibition is one to evoke enthusiasm. It is a collection of most beautiful and delicate landscapes, showing great truth to nature and most conscientious execution. The subjects are carefully chosen in regard to composition and pictorial interest; there is not one that does not make a picture; and there is no mannerism in the treatment of them. Mr. Bennett sets an example to some water-colour painters in the careful way in which he treats his buildings; notably the drawing of the architectural features of the church in "Christchurch, Hants" (9); nothing is slurred over, as much of detail is shown as the eye could see in the actual building at that distance and that light, but no more; it keeps its place in the picture. The old houses in

"Sandwich Haven" (25), the church of St. Cross (33), and the distant buildings seen in the charming drawing called "Under the Willows, Lechlade" (48), are all examples of this, which we point to because it is so common with many water-colour artists of the day to wash in buildings anyhow, as if their real appearance were of no consequence as long as they come into the scheme of composition. As a specially architectural subject we may mention the drawing of "King John's Bridge, Tewkesbury" (44), which in the treatment of brickwork and masonry texture is worthy of the late Mr. Boyce. Among the drawings which are especially admirable for general landscape effect we may specially mention "The Home Field" (7); "The Wareham Road, Corfe Castle" (10), a perfect bit of landscape composition; "A Haunt of Ancient Peace" (13), with a delightful old stone house rising above trees and water; "The Rainbow" (16), a noteworthy effort at the almost impossible achievement of representing a rainbow in pigment; "Corfe Castle" (32); "Buscot Lock" (49), a perfect bit of foreground; "Bridgnorth—a quiet afternoon" (53); and "Christchurch, Hants,—late afternoon" (36), which should be looked at from a little distance to realise the broad effect of afternoon sunlight in which it is steeped. There is no striving after effect and no neglect of detail in any of the drawings; they are careful and sympathetic studies of nature as she is.

The Royal Academy, at a general meeting this week, elected Mr. David Murray, A.R.A., to the full honours of the Academy as R.A., and elected as Associates Mr. David Farquharson and Mr. Reginald Blomfield. The election of Mr. Farquharson, after the remarkable landscapes which he has recently exhibited, was a foregone conclusion. All Mr. Blomfield's many friends will be glad to congratulate him, from personal motives, on his election, though we cannot sympathise with the view of the art of architecture which he represents, and which unfortunately appears to be the prevalent one at the Royal Academy.

STUDENTS' DRAWINGS AT THE INSTITUTE.

The subject this year for the Soane Medallion is a Royal palace on an open site, having a central courtyard and terraced garden round. The subject is an inspiring one, unhampered as it is by restrictions of cost or site, and yet the result is disappointing. The subject perhaps is almost too large for the majority of students under the age limit imposed as the conditions of the competition; it would form a delightful yet difficult exercise for any practising architect of more years and greater experience. Such a subject requires a vein of genius to stamp it as "Royal" in contradistinction to enlarged commonplace. A Royal palace suggests an order of architecture severely classical; an open symmetrical plan in which light is not separated from mystery and the unexpected; and elevations showing interest in grouping and light and shade, and an architectural environment of courtyards, fountains, and vistas such as Inigo Jones and Vanbrugh would. There is no doubt that the best design has been awarded the prize—that of Mr. S. Herbert Maw. The planning shows such a very thorough investigation of the possible requirements of a palace that its rather congested appearance may be forgiven. The only point that is overlooked seems to be that of a throne or reception room; neither the ballroom or banqueting hall is suitable for this purpose,

seeing that they would on an important occasion all be in use at the same time. The approach is from the central courtyard, reached on crossing an open loggia forming the fourth side of the courtyard. The plan on the axis line of the approach is fine—it is reminiscent of the Barberini Palace at Rome. The twin staircases on either side of the hall, similar to those at the Museum at Vienna, form the arms of a Greek cross, which is very apparent in the plan; there is, in fact, quite an ecclesiastical feeling of the Roman type about the plan throughout. The elevations are an attempt to express the great principles of the Renaissance, but are without distinction. They are, however, unobjectionable, and the sections and detail drawing show how thoroughly—and often how successfully—the difficulties of design have been grappled with; they indicate besides a fine constructive sense.

Mr. R. W. Pickering obtains honourable mention for his plan. It is one of great ability and shows largeness of conception; the arrangements are thorough and well thought out. The design suffers rather from not being very well shown. The drawings include a nice perspective drawing, and externally they show a treatment based on Hampton Court and the Louvre. Honourable mention is also awarded Mr. W. S. A. Gordon. His plan is original, but it lacks in grip; the staircase arrangements are not satisfactory; the rooms are made too frequently to fit the elevations for the plan to be good. The drawings are interesting, and the elevations are perhaps the best of any shown, but no elevation will redeem a bad plan. If these elevations expressed the plan as they should do they would not be so attractive. The design by "Roy" shows interesting possibilities, but is not worked out—the only plan shown is one-half of the ground floor. The courtyard is interesting in plan and elevation. The elevations themselves show Spanish influence; they are too small in parts and too disconnected for impressive effect.

The designs of "Q. E. D." and "H. M." are commendable for dignity of plan and sober design. That under the motto "Concrete" is feeble in the extreme in plan; it shows, however, a suitable and not unpleasant treatment of the method of construction proposed, though we have not yet—we say it thankfully—arrived at the time when Royal palaces will, from choice, have walls of reinforced concrete.

There are, as usual, a large number of competitors for the Tito prize. The subject this year is a hotel lounge and staircase. The subject is an attractive one from the point of view of design, without involving so much work as is sometimes the case. The prize has been won by Mr. Robert Atkinson with an admirable design admirably drawn. The staircase, semi-circular in plan, opening out of the square hall, is very happily conceived, and beyond, the upper order of the design, which is in the nature of an open screen, gives a very pleasant effect of perspective, emphasised by the method of lighting. The roof is a single, deep, saucer-dome, supported by pendentives on semi-circular arches the full width of the sides of the hall. These arches look rather overpowering for the lower order carrying them; no doubt the piers are sufficient structurally, but they are not convincingly so to the eye. The figure sculpture is well drawn, and the materials—mostly marbles—are well expressed on the drawings. The perspective view in colour is rather crude and garish.

Mr. C. L. Wright gains honourable mention for a quiet and subdued design of the old school type—a type which is too little the fashion at the present day. The plan shows open loggias on two floors, with the grand staircase at one end of the hall leading to the upper one. The draughtsmanship, like the design, is unassuming and accurate. The best design shown, in our opinion, is that of Mr. Alick G. Horsnell, which receives a certificate of honourable mention and five guineas. If it has a defect it is that it is too like a Roman basilica; this effect would have been minimised had the section suggested another floor over the hall. The sections suggest the sturdy grasp and reasonableness of the late Mr. Brydon's work. We think this design might have pleased the judges better still had it been more finished; the drawings would have been much more readable with washes of colour over the sectional parts of plans and sections.

A plan which is difficult to read by reason of the masses of detailed ornament on floor and

ceiling is that by "Bathon"; but for this defect it looks as though it might be good. "Martlett" shows a good design in pencil drawings, and "Anchor" a nicely-coloured set, the design based on wooden construction. A praiseworthy study in continuous vaulting supporting a central dome is that by "Scala"; the sectional drawings are better than the main design shown in the perspective view.

The Grissell this year produces nothing very interesting from the architect's point of view. The subject is a design for a winter garden in iron and glass. Mr. J. A. M. Hunter has won the prize. Mr. Hunter has designed a square building, having square corner towers at the angles, steel-plated, and lit with small casement windows. The central area between the towers is domed with an octagonal dome of iron and glass. The quarter full-size details are model constructive diagrams, and interesting in their design. "Irony of Fate" sends an original design, which would have been of some value had it not been so theatrically treated. The lines of the design are good, but the large glazed dome of rosy-pink glass would be worse in reality than it is in the drawing. The three other designs submitted in this competition are honest efforts to solve the difficulties of construction, but as designs they do not call for special notice.

The drawings for the Pugin Studentship represent seven sets. None of them show real distinction in draughtsmanship. Mr. E. Garratt has, without doubt, fairly won the Studentship by a set of careful measured drawings, in a uniform grey pencil line. His subjects are chiefly from Tewkesbury Abbey, and the drawing of the Beauchamp Chantry there is a fair specimen of his style of work. His line lacks crispness and life, while one cannot fail to compare his presentment of the pulpit at St. Chad's, Birmingham, with the finer drawing of the same by Mr. Haywood, in a former Pugin competition. But this style of drawing Gothic work, in fact, leaves much to be desired. Gothic, of all styles, with its delicate grace and freedom, wants more than a hard and fast line to adequately show it up. The very few freehand sketches in this set are quite ordinary.

An Hon. Mention and 10s. 10s. have been given to Mr. H. A. Dalrymple, who sends four strainers. The full-size details in pencil and wash are his best work, but they are somewhat unattached. We have, for instance, a half F. S. detail (how long will such extraordinary S's be printed) of the plan of a jamb at Ely with no scale drawing to explain it.

Mr. Anthony R. Barker shows what is, in many respects, the best set sent in. Here we have a return to the ideal of little snippets and colour notes, popular in some quarters, both for the Pugin and Owen Jones Studentships. But there is real delicacy as well as sense of mass in the colour sketch of Salisbury Cathedral. It is hung so low down that it can hardly be seen, and students may well be warned against putting good sketches at the bottom of a strainer. The linked measured drawing of the North Porch at Wells is also a little refreshing beside the timidity of line seen in some other sets.

Mr. Walter Godfrey shows some quite unremarkable pencil sketches, which suggest that he is, as yet, in too experimental a stage with his material. He can be recommended to stick to the style of the sketch of St. Ouen, on his first strainer, which has qualities. His measured drawings are thin and lifeless. W. L. shows pencil sketches in a stronger style, but quite lacking in constructive grip. The sketch showing the spire of St. Mary, Stamford, etc., is perhaps his best, and the colour drawing of the west door at Painsent, Devon, is effective enough in its way. Mr. Frank Dyer's principal achievement is a measured drawing of araving in Ely Cathedral, a sheet which is rather spoiled by the scattered and insignificant printing, and a certain tortuousness in the drawing of the moulded work. Some of his work (notably the measured drawing in shaded pencil of St. Mary, Beverley) recalls the style of illustration in the early days of the Gothic revival. Mr. Norman Culley goes in for a rather "woolly" style of pencil sketching, the result of smearing or rubbing. Some of his work is also obviously laboured and out of drawing. His best line of work is in the free pencil measurement, with wash, of the Priory Church details on his second strainer.

It is with greater satisfaction that we turn to the Owen Jones Competition, although it has.

unfortunate features in the fact that only three sets have been sent in for it, and in the sight of Mr. MacLachlan's now too familiar strainers, one can but wish that the Institute had rewarded his patience, but the opportunity was more obvious last year. Without doubt, also, Mr. MacLachlan is to blame for not adding to the interest of his set year by year (this time, as far as we remember, it is thinner than usual), and it must also be said that his colour, though pleasing enough, and very well put on, would not always be convincing beside the originals of his subjects. His colour schemes, in fact, are conventions which lack the sobriety of true compromise as opposed to false. For all that, Mr. MacLachlan always makes a very effective drawing, and, without doubt, he has had hard luck.

It is gratifying in more ways than one to see the Studentship going to Mr. Harry Morley. The kind of Italian decoration which he shows in his principal exhibit is the very best kind, and has had but scant treatment within recent years in this competition. The Renaissance decoration of the Genese Palaces has that balanced and (to modern architects) useful quality which is so often lacking in the subjects chosen by students. We fancy we have seen the coloured design of the ceiling of the Palazzo Imperiale at Genoa in some book, but, at any rate, Mr. Morley has gone to the proper sources for good Italian decoration. In his drawings, also, he has just hit the right colour tones, and displays all round as satisfactory a sense of colour as has been seen in this competition for some time. He gives us some renderings of the ever-popular Della Robbia ware, and more notable even than the drawing of the fine altar-piece in South Kensington is the blue tone in the copies of the circular plaques by Luca della Robbia, which is as right as it could be. One might only say, by way of adverse criticism, that two of the strainers are largely occupied by unnecessary matter for a colour competition, and that the red tone of the robe in the figure, by Fra Angelico, is not quite faultless.

Mr. Beattie Brown, who shows the third set, can evidently turn out very good drawings, but he is wildly at sea in some of his colour renderings. What ought to have been his finest work, the magnificent Della Robbia frieze of the Ospedale del Ceppo at Pistoia, is spoiled by its too ambitious and entirely wrong rendering of the colour scheme. More glaringly bad are the drawings of the Mausoleum of Galla Placidia at Ravenna. Even when brand new, and if dragged into the light of day, this gem of subdued Byzantine decoration could never have displayed such a staring French (or worse) blue as is here shown. In the large coloured measured drawing also the front of S. Maria Novella, at Florence, becomes almost unrecognisable. The best rendering in this set is perhaps that of the lavatory in the same church, but even this rather inclines to the worst side of what we might call the "emerald-green" school.

The Measured Drawings Medal Competition has been very well patronised. It is a little hard to understand why the Committee gave the first place to the Haddon Hall drawings of Mr. Edward G. Wyllie. It is a very good set, but there are such obviously better ones in the room. We should have thought that the prize would undoubtedly have gone to Mr. Arthur R. H. Jackson's fine drawings in brown ink of the Pazzi Chapel at Santa Croce, Florence, but for the fact that they have no dimensions; for, in a competition of this kind, it is advisable, if not essential, to thus guarantee the accuracy of the work. The Pazzi Chapel drawings in this case, however, are of such a character that the elevations and sections, at least, would have been spoiled by figured dimensions. Their full size work is especially noticeable, the various details being finely rendered in an outline with the brush. The set gets an hon. mention.

We should be inclined to place second the drawings of Somerset House, by Mr. W. Harold Hillyer, which gain an hon. mention also. They represent not only an intrinsically finer subject than those of Haddon Hall, but seem also to show greater care and just as much force. "Culdee" is to be congratulated on having produced a workmanlike set of Dunblane Cathedral; the more so as it has gained no mention, and as one can easily recognise the amount of labour bestowed on such a pronounced Gothic subject. "Erin II." has also produced a good, though somewhat unequal,

set. His sections of the Church of Saint Benet, Paul's Wharf, are particularly good. "Auld Reekie" shows a good average set of the Banqueting House in Kensington-gardens; and "Porton Craig" shows the quaint little church of St. Monance, Fifeshire, in five very fair strainers. The other sets of the fourteen sent in are not at all remarkable. "Lux" shows St. James's Church, Piccadilly; "1903," Greenwich Hospital (or part of it); "Duomo," the peristylum of the dome of St. Paul's (an interesting subject); "Ell," Morden College, Blackheath; "Sundial," St. Peter's, North Hants; and "Wharfedale," Bolton Percy Church. Mr. F. Winton Newman wins the "Arthur Cayley" prize with an interesting set, comprising measured drawings, sketches, and design. The measured work shows vaulting from Westminster Abbey, and also the York Gate, a sketch of a wall or arch at Winchester, another of St. John's College Gateway, Oxford (reminiscent in style of Mr. Fulton's drawing of the same). His design for a picture gallery for a country town is monumental and original, though perhaps hardly sufficiently restrained in its proportions and detail. Mr. Vincent Hooper receives hon. mention. He exhibits measured drawings of the cloister vaulting and the north porch of Wells. The perspective view of the latter is a really fine drawing, showing a knowledge of scenography usually lacking in architectural drawings. His other drawings are also well and carefully done.

UNIVERSITY COLLEGE SCHOOL COMPETITION.

THE proposal to remove the University College School from the classic buildings in Gower-street to a more convenient site in Hampstead is an important step about to be undertaken by the governors of this leading London educational establishment. Competitive designs for the new buildings by five well-known architects have been on exhibition during the last few days, and we were invited to view the various plans, of which the following remarks may convey general impressions.

The assessor's task was not difficult; in selecting the design of Mr. Arnold Mitchell, Sir Aston Webb has selected the most practical and the simplest of the competitive schemes. The author's idea has been to provide an institution upon the lines of an orthodox secondary school, and in reconciling the accommodation of a large public school with departmental principles, he has arrived at a clever solution of the problem.

The plan, which is illustrated in this issue, shows a symmetrical arrangement of three buildings connected by two short corridors. The middle block is given up to central hall, with surrounding class-rooms on all four sides—which will be found to be a most convenient—and the headmaster's and board-rooms are placed on either hand of the main entrance at the ground level. The bottom story of the wings contains juniors' and seniors' cloak-rooms and lavatories, and here the gymnasium and covered playground are also situated. The upper story of the north block is arranged as dining-hall with necessary service, while the south wing, which, owing to the fall in the site, has three floors, thereby securing symmetry to the main front, contains physical and chemical laboratories, library, and art school. A central corridor runs throughout the entire length of the three buildings. This is all very compact and straightforward, but certain parts are cramped in order to maintain this balance of parts. The gymnasium and covered playground, for instance, are too small. The staircases leading from the many first-floor class-rooms are much too narrow, and are forced into very limited positions; they discharge on to blank walls instead of delivering into wide free spaces. The gymnasium floor is lowered to obtain its necessary head room, but the design of the fronts produces a height of barely 13 ft. 6 in. in the dining-room, which is 60 ft. wide and accommodates 300 youthful diners. Moreover, the circular windows (there is also top light) are placed at such a height from the floor as to prohibit all outlook. No doubt some of these, as well as other matters, will disappear from the working drawings.

Turning to the elevations it is satisfactory to find a broad treatment of the brick and stone materials. A high-pitched green slate roof,

spanning the central hall, rises, with a ventilating turret, in the middle of the composition. Two turrets similar in detail and size also appear above the main staircases, but we could not see that they possessed any purpose either of use or effect. The stone colonnaded entrance feature is in excellent taste, as is the severity of the simple parapet which finishes the outer walls of this middle block. The grouping of the three windows of each class-room is happy, and the attempt to make the ground-floor sanitary conveniences perform mighty acts of support to the angle piers and chimneys deserves a successful issue. The same breadth of treatment characterises the design of the detached blocks, although the lighting of the respective parts is subordinated to external effect. There is a refreshing absence of columns, pilasters and regulation competition features from what is undoubtedly a very successful scheme.

In the design submitted by Mr. H. T. Hare the subject is treated from a different aspect. Although following the distribution of parts given by the previous author, the problem is solved on the lines of a large college more than of an elementary school, and we find a greater expanse and wider distribution of buildings, occupying practically the whole length of the site. The plan consists of a central block and two wings at right angles to the front, the three buildings being connected by long arms containing cloak-rooms and lavatories, in front of which are paved courts and cloisters. Corridors are necessarily extensive, and do not facilitate the working of the school, although they simplify the arrangement of mechanical heating and ventilation which is provided. The entrances, and indeed all details, are thoroughly sound in what is a fine architectural plan, and which is graced by a quiet and tasteful external expression; but the conception is too generous both in its interpretation of the authorities' demands and in its relation to the actual site.

Mr. Paul Waterhouse submits a design which appears to arise from an idea of providing two important fronts—one towards the play-ground and the other facing the road—and, although the general view suggests a struggle for supremacy by the two facades, the plan shows a very adroit solution of what is thus made a complex problem. The buildings are grouped at the north or top end of the site into administrative block, central block, and science wing. The school proper is in the middle position facing due south, and has a long concave frontage line; cloakrooms are in the basement, class-rooms in two floors above, and assembly-hall, gymnasium, etc., to the rear.

Both the main buildings have three stories, but the arrangement of entrances, corridors, and staircases is very workable. The design, however, is wasteful in many particulars, especially in the basement, where the space below the great hall is entirely given up to bicycles, and the provision for coats and lavatories is considerably overdone. Elaborate intentions are to be seen in the two entrance drives; the innumerable sort flights of steps both in and out of the buildings are bad; but the design is full of new ideas, which, however, are more allied to public institutions of a healing or entertaining order.

Professor F. M. Simpson also places his buildings at the upper end of the site with the main front facing south. The principal entrance is from a forecourt on the west or road side, which is formed by the breaking forward of the science block. Here is another three-storied scheme which involves a large basement and much stair traffic. The general planning of the schoolrooms is good, but in minor points this design leaves much to be desired. For instance, the dining-room in the basement—which is 38 ft. 6 in. wide—is figured 12 ft. 1 in. high, and is badly lighted and ventilated. The south light of the boardroom is shut out to allow the exterior to imitate the interior at the other end of the front, and the isolation-room, which is close at hand, is in no sense of the term isolated. The main staircases discharge inconveniently on the ground floor. The exterior shows a stone rusticated ground story with a projecting semi-circular open playshed, upon which rests a brick and stone superstructure cut up into regular masses in which four pediments are prominent. Although the roof and stone turret of the central hall are seen, the design of the fronts lacks interest.

The south end of the ground is selected by Mr. Chatfield Clarke for his school buildings, which have an excellent plan shown by good drawings. The central hall, with class-rooms

three sides, stands in advance of wings remaining, on the north, laboratories and kitchen, and on the south, dining-room and service. A corridor on the east side joins up the three blocks, and beyond this are lavatories, etc., and space for extension of classrooms, etc., but this would be a very convenient plan, but the grouping of the parts is unsatisfactory in that there is no symmetry in the fronts. The north wing has three floors, and the south one story, whilst the two-storied class-room block in the centre does not lend itself to a dignified or interesting front. Revision is needed in certain parts of the plan, particularly in the cloak-rooms, where confusion would arise from the absence of simple means of ingress and egress.

We were pleased to find that the conditions of the competition, drawn up by Sir Aston Webb, were very simple, and required $\frac{1}{8}$ -in. scale drawings (in place of the $\frac{1}{4}$ -in. scale usually demanded) which is quite sufficient for competition purposes.

It is to be hoped that when these new schools are built, and some of the work thus removed from Gower-street, the University College authorities will see their way to pull down the ugly one-story building erected some years ago, which defaces the street view of the quadrangle and destroys Wilkins's intention in the design.

MR. CLAUSEN'S LECTURES ON PAINTING.

MR. CLAUSEN'S fourth and concluding lecture to the Royal Academy students, on Thursday the 19th, was on the subject of "Taste." A painter, he said, finished and sent out into the world a picture, the expression of his standard of taste; something which might live or die, might give pleasure or not, or might come back to him and be turned with its face to the wall. But no judgment on a picture was worth much till the work had been some time before the world. The judgment of the moment might be warped by passing prejudices. We must therefore go back to the older painters, to those whose works had stood the test of, say, fifty years, for a standard of taste. Bad taste might be shown either in the choice of a disagreeable or revolting subject, or in the bad treatment of what was in itself a good subject. Taste in painting was something like natural good manners in life. A man's picture showed his outlook on the world. A picture that was in good taste might be compared to our ideal friend, the person who was in harmony with the best that we knew. There was no fixed standard of taste. Each quality in a great picture had its own standard; all artists did not strive after the same ideal. We might take it that Pheidias, Michelangelo, Raphael, Velasquez, Titian, Rembrandt, Claude, and Constable, were all artists who represented a high standard of taste in one way or another. Pheidias and Michelangelo indeed stood apart; they were so supreme that they represented a standard quite beyond criticism. In general, one requirement of taste was that form should be well expressed and should be natural. In this respect Raphael stood highest. Our difficulties apparently did not exist for him; and his works were true to human nature, though (as in Greek art) it was a form of human nature that was removed from modern life, that belonged to the past, and his works should be studied in the same spirit as we studied the works of Greek art. Watts had evidently closely studied ancient art in this spirit, and his works were an example of the value of such study. Velasquez furnished a standard of taste in the painting of natural things as we saw them. Owing to his realism of imitation he was in a sense nearer to us than Raphael, he was so like nature. We did not feel quite the same before the works of Titian and Rembrandt. They did not draw so direct from nature; we had to get their point of view. Titian was the highest standard as to what could be done with colour; Rembrandt as to what could be done with light. Now, what was "Taste"? Reynolds said it was the act of the mind by which we liked or disliked anything. The natural appetite of taste was for truth; but it did not follow that all representation of truth was in good taste. Horrible subjects, for instance, were not in good taste. Such things no doubt existed, and French artists painted them—sometimes exceedingly well. Nor did it follow that one should always paint only pleasing subjects. But a subject should be in accordance with the general instinct of human nature.

Cruel subjects were not so. Rembrandt was sometimes repellant, in spite of his power, from his choice of subject; witness his picture of the butcher's shop, and the carcase hanging up in the foreground. Was that in good taste? Other Dutch painters repelled us at times from the coarseness of their tavern scenes, but not so much as Rembrandt, because they were not so much in earnest. They might fancy a Dutch artist of this class taking one into a tavern, and saying "Never mind those people; they are rather drunk, but they are not bad fellows in their way; but look at this effect of light, look at the colour here," and so on. We might contrast the Dutch painters with Watteau, who in his pictures brought together everything that was charming in scene and in his figures; there was no jarring note. Yet his effect did not depend so much on the artistic management of light, or illustrate it so well, as the works of the Dutch artists. But he understood harmony of colour and truth of lighting, and his followers, who used the same properties as he did, were weak in comparison from their want of perception on these points. If it were objected, do we see in nature the strong contrasts of light and shadow used by painters to bring the effect of a group or of an incident in a picture? He would reply, no; but it was perfectly legitimate for a painter to darken one portion of a scene in order to emphasise another. A spectator with his attention directed to one figure out of a crowd would see that figure prominently, and his eye would pass over the rest with little notice. A photograph of the scene, however, would have no such effect; the prominence of the figure of special interest would disappear. It was for the painter so to treat the scene as to recover that prominence of the most important figure in it. The painter suppressed things which were of minor importance in order to direct the attention to the most important point.

Taste was not, like fashion, a mere unreasonable preference. Taste depended on things being in their right relation to nature. We had each our own ideals, but in cultivating them we could get help from criticism, our own as well as that of others. We might put another work along with one of our own, and see which we liked best, and why. If the result were unfavourable to our own work, we should generally find that it came to a question either of selection or of suppression. Or take up an old work of our own that we had forgotten, and see how it looked to us now. Things seen at a later date may be recognised as affectations, though not seen so at the time. On the other hand, work which was really of good and lasting quality might fail to get acceptance from being outside the general taste of its own time. Millet and Corot were instances of this; the former was almost neglected in his lifetime, and Corot never sold a picture till after he was fifty. [Fifty-six, we believe was the age; and if we remember right, Corot owed the commencement of his success to the late Emperor of the French, who bought his picture at the Salon and consequently brought him into vogue.] The opposition of public opinion to an artist with a new point of view did not arise so much from a dislike of novelty, as from a resentment of anything which implied that the current ideas in art were wrong. Public taste really rested on the standard formed by painters. There were a few of the public, perhaps, who understood them; a few who wished to do so; the remainder, the majority, were indifferent. The conditions under which painters worked in these days of exhibitions were very different from those of former days. There was a time when a painter was regarded as a necessary person, as we now regarded a carpenter; he received an order, did his work and was paid for it. The Dutch painters were in this position; they kept their own standard among themselves, but their purchasers knew nothing of it. When Velasquez was at Rome and waiting for a commission, he painted a portrait of his own servant to get his hand in. That painting was shown along with others in what was a kind of exhibition, when it was remarked that this figure alone seemed to be real and all the rest pictures; but it was not painted for exhibition; it was painted only for practice. In modern times, when pictures competed for public favour in large exhibitions, there was a temptation to paint something sensational in order to compel attention; the worst form of this was seen

in the Paris Salon, where some artists painted pictures of cruel or revolting subjects in order to be looked at. We did not see this in England; but we might hear a picture approved as being "a good exhibition picture," but not one to live with. What were pictures for but to live with? Another result of the multiplicity of exhibitions was the attempt to attract attention by forcing contrasts of colour, even going to the extremes of pure white and pure black. They would find an immense range of colour in Watts's pictures, but neither black nor white. Harmony of colour was the true strength of a picture, not the opposition of exaggerated blacks and whites.

Painting was so subtle an art that it was only when well on in life that one arrived at the full understanding of the greatest work. Painters knew the difficulty of what might be called getting a picture together. The way the background was used was most important; but it did not occur to those who had given no thought to the subject that background was so important an element, nor that foreground figures were relieved against it. It was not so difficult to give the facts in a scene as to give them a fine artistic quality.

It was complained sometimes that painters had not the same chances now that they had in former days; that modern civilisation and modern dress were ugly and uninteresting. It would be found, however, that this had been a constant complaint in other periods. Reynolds said that the familiarity of modern dress destroyed the dignity of a picture; hence he frequently draped his portraits of ladies in a flowing semi-Greek costume; yet we now thought the dresses of that day very picturesque, and we no longer cared for portraits in Greek and Roman dresses. It was better to accept the life of the day as it was and make the best of it in painting; though it must be admitted that our present complex civilisation did not make for beauty. Painters liked simple and broad aspects of life, simple actions. A city man going to his business in the twopenny tube might be just as worthy a man as a ploughman doing his work in the open field, but the painter preferred the ploughman because he was seen in connexion with great elements of nature, while the city man was in the midst of depressing and commonplace surroundings. Light was the governing thing in painting; many things were beautiful if you only got the right light on them. A masterpiece in painting was as possible now as ever, if we had it in us to produce one.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE usual fortnightly meeting of the Royal Institute of British Architects was held on Monday at No. 9, Conduit-street, W., Mr. T. E. Colclutt, vice-president, in the chair.

The Chairman moved that the minutes be confirmed.

Mr. H. Hardwicke Langston said he would like something added to the minutes referring to the question he asked at the previous meeting. It was a question with regard to the case of Robins v. Goddard, and the President on that occasion said the matter was receiving the attention of the Professional Defence Committee. There was no reference to the matter in the minutes, and he considered it was of sufficient importance to find a place there.

The Chairman said he must confess he did not know what the case happened to refer to.

Mr. Langston said it was a question affecting the conditions of contract.* The decision in the case challenged the whole document, and rendered it of practically no effect at all. He considered it was certainly a matter which ought to be of interest to them, and if it was allowed to remain where it was they would feel the inconvenience of the decision. He wished to see a reference made to the question in the minutes, so that he might be assured that it was receiving the attention of the Committee.

Mr. Locke (Secretary) pointed out that no reference was made to the question in the minutes because it was an informal matter, and the Chairman simply said it was receiving the attention of the Committee.

Mr. Langston said that was why he wanted it noted in the minutes. He moved that a reference to the matter be added to the minutes.

Mr. Middleton said he was present at the

* See our issue for Dec. 17, 1904, p. 644.

last meeting, and heard the question, and feeling that anything which took place at a meeting ought to be recorded on the minutes, he seconded the resolution of Mr. Langston.

Mr. W. Woodward said, although it was true the question was raised by Mr. Langston, still it was entirely outside the subject of the evening. It was only by the courtesy of the Chairman that the question was allowed, and he did not feel it ought to be recorded.

Mr. Langston said it was quite true that he was answered courteously by the Chairman, but he felt a reference in the minutes was needed.

The Chairman said that as he understood it the Chairman of the evening took it as simply an informal matter. It was out of order in the first place, and was taken in a purely informal manner, and personally he did not feel there was any reason why it should be pressed upon the meeting.

Mr. Langston: It has been proposed and seconded.

The Chairman put the motion to the meeting, and declared it lost, and the minutes were confirmed.

The Late Mr. T. Blashill.

Mr. Graham (Hon. Sec.) said it was his melancholy duty to announce the decease of their esteemed colleague, Thos. Blashill. He was elected an Associate in 1866 and a Fellow in 1877, and for three years did practical and good work on the Council of the Institute. He was certain there was not a member of the Institute who had not a pleasant word to say of Thos. Blashill. During the many years he so honourably fulfilled the responsible duties of superintending architect to the London County Council, he rendered to many of them very great assistance in setting them right on the many vexed points in the Building Act, and he was sure they would never forget his good services, not only there, but also in that room, where he was a regular attendant, and took an active part in their discussions. Whether in Spring-gardens in his official capacity, or in that room, he always had with him an air of good fellowship, which never left him, and he felt sure that amongst the pleasant memories they would have of Thomas Blashill was that he was such a good fellow. It was their intention to send a letter to Mrs. Blashill sympathising with her in the great loss she has sustained, and expressing on the part of every member of the Institute their high appreciation of his merits and worth, and regretting that he had passed away from them so soon and so unexpectedly. He put the formal resolution that the letter be sent.

The motion was carried in silence.

Mr. W. Woodward said he would like to add one word. He remembered spending a pleasant evening with Mr. Blashill, and was delighted at the careful notes and sketches he always made on his Continental journeys. Mr. Blashill devoted many hours to the practical part of his visits, and if some of the younger members of the Institute could go through some of the note-books which Mr. Blashill filled on his many holidays on the Continent it would do them much good. He thoroughly endorsed what had been said as to the assistance rendered to them at Spring-gardens by the deceased. Although Mr. Blashill was controlled to a large extent by the Building Act Committee, he did extend to his fellow architects every possible assistance in the carrying out of their work in London. Mr. Blashill was a very busy man, and, as was always the case with busy men, he gave them the benefit of his experience, and read papers both before the Institute and the kindred institution in Great George-street. It was a lesson to all of them that the deceased, in the midst of his multifarious duties, was able to do so much for the benefit of the profession to which they belonged.

Mr. Hudson said that having met Mr. Blashill as a citizen in the Borough of St. Pancras, with which he (the speaker) was associated, he would like to refer to the great assistance the deceased gave to the charities of the district. Mr. Blashill acted as churchwarden on more than one occasion, and the work he did in connexion with the charities would not be forgotten for many years to come.

Prizes and Studentships.

Mr. Locke then read the Council's Deed of Award in connexion with the prizes and studentships for 1905. The Deed of Award stated that the Council have examined the works submitted for the Institute Silver Medals, the

Soane Medallion, the Owen Jones and Pugin Studentships, the Godwin Bursary, the Tite Prize, the Arthur Cates Prize, and the Grissell Gold Medal, and gives particulars of the competitions and the results thereof as follows:—

The Royal Institute Silver Medals.

(i.) *The Essay Medal and Twenty-five Guineas.*—Fourteen essays on "The Development of Architectural Art from Structural Requirements and Nature of Materials" were received for the Silver Medal. The Council have awarded the Medal and twenty-five guineas to the author of the essay submitted under motto "Dil Aram" [Miss Ethel Charles, Flushing, near Falmouth]; a prize of ten guineas and a Certificate of Hon. Mention to the author of the essay bearing the motto "Beauty is Truth, Truth Beauty" [A. Romney Green, Haslemere]; and Certificates of Hon. Mention to the authors of the essays submitted under the mottoes respectively of "Brunelleschi" [J. J. Waddell, Drumoyne, Uddington, N.B.]; "Hawk" [J. Murray Kendall, S. Hampstead, N.W.]; "I bide my time" [L. P. Abercrombie, Waverley]; "Edmund, King and Martyr" [Cyril E. Power, Putney, S.W.]; and "Ubique" [H. P. G. Manle, London].

(ii.) *The Measured Drawings Medal and 10l. 10s.*—Seventeen sets of drawings were sent in of the various buildings indicated, and under mottoes as follows:—

1. "Auld Reekie"—5 strainers (Banqueting Hall, Kensington).
2. "Clyde"—6 strainers (St. Michael's Parish Church, Linlithgow).
3. "Guldee"—6 strainers (Dunblane Cathedral).
4. "Device of Circles"—5 strainers (Church of St. Mary, Carmel, Lancs.).
5. "Device of a Red Disk"—6 strainers (The Pazzi Chapel, Santa Croce, Florence).
6. "Duomo"—4 strainers (Peristyle to Dome, St. Paul's Cathedral).
7. "Ell"—6 strainers (Morden College, Blackheath).
8. "Erin II."—6 strainers (Saint Benet's, Paul's Wharf, E.C.).
9. "Lark"—4 strainers (St. James's Church, Piccadilly).
10. "1903"—5 strainers (Greenwich Hospital).
11. "Porton-Craig"—5 strainers (Church of St. Monague, Pileshire).
12. "Sundial"—5 strainers (Church of St. Peter, Lowick, Northants).
13. "The Nilghai"—4 strainers (Church of St. Swithin, Worcester).
14. "Thames"—5 strainers (Somerset House).
15. "Unicus"—6 strainers (Haddon Hall, Derbyshire, submitted under the motto "Unicus" [E. G. Wylie, Glasgow], and Certificates of Hon. Mention to the delineators of Somerset House, London, and the Pazzi Chapel, Santa Croce, Florence, submitted under the motto "Thames" [W. H. Hillyer, Shortlands], and the device of a Red Disk [A. R. H. Jackson, South Kensington, S.W.].
17. "V"—4 strainers (Church of St. Alphege, Greenwich).

The Council award the Silver Medal and 10l. 10s. to the delineator of Haddon Hall, Derbyshire, submitted under the motto "Unicus" [E. G. Wylie, Glasgow], and Certificates of Hon. Mention to the delineators of Somerset House, London, and the Pazzi Chapel, Santa Croce, Florence, submitted under the motto "Thames" [W. H. Hillyer, Shortlands], and the device of a Red Disk [A. R. H. Jackson, South Kensington, S.W.].

The Travelling Studentships.

(i.) *The Soane Medallion and 100l.*—Twelve designs for a royal palace were submitted. The Council have awarded the Medallion and (subject to the specified conditions) the sum of 100l. to the author of the design bearing the motto "Crumpets" [S. H. Maw, Bolton, Lancashire], and Certificates of Hon. Mention to the authors of the designs bearing the motto of "Benedick" [R. W. Pickering, Torrington-square, W.C.], and the device of a "Lion rampant" [W. S. A. Gordon, Chelsea].

(ii.) *The Owen Jones Studentship and 100l.*—Three applications were received for the Owen Jones Studentship from the following:—1. W. B. Brown, jun.—6 strainers; 2. James McLeachlan—6 strainers; 3. Harry Morley—6 strainers. The Council have awarded the Certificate and (subject to the specified conditions) the sum of 100l. to Mr. H. Morley, South Kensington, S.W.

(iii.) *The Pugin Studentship and 40l.*—Seven applications were received for the Pugin Studentship from the following:—1. A. R. Barker—6 strainers; 2. Norman Liley—5 strainers; 3. H. A. Dalrymple—6 strainers; 4. Frank Dyer—6 strainers; 5. E. Gerratt—6 strainers; 6. W. H. Godfrey—6 strainers; 7. L. Wilkinson—6 strainers. The Council have awarded the Medal and (subject to the specified conditions) the sum of 40l. to Mr. Ed. Gerratt, Darlaston, near Birmingham, and a Certificate of Hon. Mention and 10l. 10s. to Mr. Hugh A. Dalrymple, Bloomsbury, W.C.

(iv.) *The Godwin Medal and 65l.*—One application was received for the Godwin Bursary,

from Mr. F. R. Hiorns, of Wimbledon, S.W., and the Council have awarded to him the Medal and (subject to the specified conditions) the sum of 65l.

(v.) *The Tite Certificate and 30l.*—Nineteen designs for an hotel lounge and staircase were submitted. The Council have awarded the Certificate and (subject to the specified conditions) a sum of 30l. to the author of the design bearing the motto "Palladio" [R. Atkinson, Lenton, Nottingham], a Certificate of Hon. Mention and 5l. 5s. to the author of the design bearing the motto "E Angle" [A. G. Horsnell, Chelmsford, Essex], and a Certificate of Hon. Mention to the author of the design bearing the motto "Vieta" [C. L. Wright, West Kensington, W.].

The Arthur Cates Prize: 40l.

Two applications for the Arthur Cates Prize were received from the following gentlemen:—1. Vincent Hooper—6 strainers; 2. F. Winton Newman—6 strainers. The Council have awarded the prize to Mr. F. Winton Newman, Hampstead, N.W., and a Certificate of Hon. Mention to Mr. Vincent Hooper, Redhill, Surrey.

Prize for Design and Construction.

The Grissell Gold Medal and 10l. 10s.—Five designs for a winter garden in iron and glass were submitted. The Council have awarded the Medal and 10l. 10s. to the author of the design bearing the motto "Onward" [J. A. M. Hunter, Portlethen, by Aberdeen].

The Ashpitel Prize, 1904.

The Council have, on the recommendation of the Board of Examiners (Architecture), awarded the Ashpitel Prize to Mr. C. L. Gill, Regent's Park, N.W. Mr. Gill was registered Probationer in 1901, Student in 1902, and passed the Final Examination in November, 1904.

The Travelling Students' Work.

Soane Medallist, 1903.—The Council have approved the drawings executed by Mr. Edwin F. Reynolds, who was awarded the Medallion in 1903, and who studied in Egypt, Greece, Italy, and Turkey.

Pugin Studentship, 1904.—The Council have approved the work of Mr. F. C. Mears who was elected Pugin Student for 1904, and who studied in Somersetshire.

The designs and drawings submitted for the Institute Prizes and Studentships are now on exhibition in the Gallery of the Alpine Club (entrance in Mill-street, Conduit-street, W.). The exhibition is open every day from 10 a.m. till 8 p.m., until it closes on February 4. The presentation of prizes takes place on February 6.

European Architecture in India.

Mr. James Ransome, consulting architect to the Government of India, then read a paper on "European Architecture in India," of which the following is an abstract:—

Referring to the tendency in recent years in India to erect buildings in the styles and upon the lines of those found to be suitable in England, the author said he proposed to demonstrate the obstacles which opposed this practice, and to stimulate discussion upon the advisability of its continuance as a principle. For though the dearth of good European buildings in India was undoubtedly largely due to the lack of proper architectural training in their designers, it was at least open to debate whether this deficiency might not be, in an even greater measure, the result of an insistence upon European traditions in the face of climatic opposition. To enable those who had not visited India to form an opinion on the subject the author described such of the main conditions as must necessarily influence its architecture. In this connexion he dealt with the cheap and abundant labour, the capacities of the native workman, the building materials and conditions influencing their use, climatic conditions, etc.

Except where earthquakes are of frequent occurrence, and in the case of buildings erected immediately after such disturbances, the possibility of their occurrence does not appear to have influenced the construction or designs of buildings; on the contrary, there seems to be a feeling that even the smaller buildings are incomplete without a tower, dome, minaret, or turret. Cyclones affect construction rather than design, while dust-storms render it advisable that all apertures ordinarily left open may be closed on occasions. In many districts the prevalence of flies necessitates the addition

of gauze shutters to every opening, which requires special treatment if it is to escape disfigurement.

A really water-tight roof is an unusual luxury in India, and as failure in this respect is attributed to the severity of the rains rather than the inefficiency of the roofs, but little effort has been made towards their improvement. Later pitched roofs have come increasingly into use, and though contrary to the traditions of the country, seem likely to survive the prejudices against them. It is something of a surprise to find that sheet iron, either corrugated or plain, is largely used for roof-coverings in India, since it offers but little resistance to the outside temperature, is very noisy and rarely water-tight during the rains, requires constant attention, has no lasting properties, and is always unsightly.

In a country where buildings are rarely to be seen except beneath a brilliant and cloudless sky, the influence of cast shadows calls for greater consideration than in places blessed with less sunshine; hence much of the European work in India appears at its best only on the comparatively rare occasions when the sky is clouded. The native work is often richly inlaid with marbles, stones, and tiles, and when carving is employed externally it is usually in low relief. For the most part Indian bricks are of excellent colour and quality, and susceptible of sufficiently fine treatment. The bricks are rubbed so that their joints are hardly perceptible, and the whole of the face is finely carved. Such work is abundant in many of the native cities, and is still being executed, but unless encouraged by Europeans, will shortly cease to be practised.

Dealing with the temperature of India so far as it affects building designs the author classified the climate under three headings—viz., that of the Hills, that of the Plains, and that of the Coast, describing typical cases of each to convey an idea of the general conditions. The temperature of the Hills tallies so nearly with what we are accustomed to in this country that, so far as heat and cold are concerned, there is no reason why buildings suited to an English climate should not serve their purpose equally well if transplanted to the hills of India. Unfortunately, most of the buildings in the Hills have been designed by those accustomed to deal with the buildings in the Plains. Hence the type of building ordinarily found there has rooms opening into verandahs, which contain the staircases, and offer the only means of access from one room to another. In private dwellings it is customary to glaze these verandahs on account of the cold, and this treatment has the effect of restricting the light and air admitted into the living-rooms. These, in consequence, fall into disuse during the day, and are deserted in favour of the glazed verandahs, which have ordinarily the temperature of a hot-house during the day and are often bitterly cold at night. This unhealthy arrangement is probably responsible for much of the illness to which residents in the Hills are subject.

While the temperature of the Coast may be considered as uniformly hot, that of the Plains, though rising many degrees higher during the hottest days, falls considerably at night, and is some 30 degrees cooler in winter than in summer. Hence it is customary in the Plains to close all apertures and exclude the outside air during the hot days, while around the Coast, windows and doors are thrown open all the year round, and the windows are frequently left unglazed. In the older buildings these opposite conditions produced a marked difference in the plans of buildings for the Plains and those for the Coast; for whereas the former were, as a rule, compact, with lofty rooms grouped around a large central apartment usually unit by windows, the plans of buildings for the Coast were extended and arranged so that the rooms had as many outside walls as possible. In the more modern buildings this difference is less marked, for on the one hand the introduction of cooling by evaporation has opened out the plans of buildings for the Plains, while increased cost of building has curtailed the area of those for the Coast. As a rule, however, the older arrangements were more satisfactory, and it is not desirable that the conditions which gave rise to them should be overlooked.

But whether on the coast or inland the comfort of buildings in the plains of India is chiefly dependent upon the extent to which their walls are protected from the rays of the

sun. Many of the European buildings are now built without verandahs; but as their omission entails great discomfort, and ultimately results in the disfigurement of the building by various devices for protecting it from the sun, there can be no question as to the necessity for verandahs around the external walls of every habitable room except those facing north. It follows, therefore, that the appearance of an Indian building must necessarily be largely dependent upon the treatment given to its verandahs, and one of the chief difficulties in this connexion is that of exposing a sufficient feeling of solidity in a building of which so large a proportion of its main walls must be concealed.

It would probably occur to most architects that these conditions should be favourable to the employment of classic colonnades; and that this was the opinion of the designers of the early European buildings is demonstrated by the fact that nearly all of them were thus treated. The author went on to show, however, that the application of classic architecture to Indian buildings was attended with difficulties, and that the achievement of a successful Gothic building under conditions which entailed the concealment of its windows was an even greater problem. In ecclesiastical buildings it has been the custom to indulge Gothic traditions at the expense of any considerations of climate. No advantage appears to have been taken of the natural adaptability of cloisters to serve the purpose of verandahs, which are usually omitted from designs for churches, and large, unprotected east-and-west windows are frequently introduced; hence Indian churches are, for the most part, unbearably hot, and frequently useless for purposes of worship during the hot weather. The author referred, however, to an effective arrangement in the Cathedral at Allahabad (Sir Wm. Emerson, architect), where the windows are in deep recesses and flanked by buttresses of considerable projection: this arrangement has the advantage of throwing the windows in shade during the greater part of the day.

In many of the modern designs for buildings attempts are made to follow the lines of native Indian architecture; as a rule, however, not with very satisfactory results, as they are based upon a too perfunctory study of native work. Considering it inevitable, and probably desirable, that European architecture in India should be influenced by the native styles of the country, the author went on to give a rough outline of their chief characteristics and some illustration of the designs they have inspired.

For this purpose Indian architecture may be broadly classified under two heads—viz., Hindu and Saracenic. Instances of satisfactory structural forms are rarely to be met with in Hindu work, which seems never to have shaken itself free of the timber and rock-cut traditions upon which it was based. Yet much of this work is covered with beautiful detail and enriched with refined and graceful ornament.

It is strange that such a monument to the power of simplicity as the Taj Mahal should stand in a country so rich in need of the lesson it should teach, and the fact that its influence upon the architecture of the country is imperceptible is perhaps even more surprising. Much of its effect is undoubtedly due to the increased play of light and shade, induced by its walls meeting at obtuse angles—a form of treatment which might be applied more generally to the walls of verandahs without detriment to their utility, and with some advantage to their appearance; for the excessive accentuation of right angles, produced by the brilliant sunlight of the plains, is not always beneficial to the appearance of a building.

A dome is not ordinarily an economic form of roof, and it is not easy to find any useful employment for minarets and the little domed structures with which the roofs of Saracenic buildings are usually decorated, and which play so large a part in their composition. Nor is there much need in European buildings for the finely-pierced stone tracery which was extensively used in the windows and balconies of this style; or for those curious and typical features known as Jhankas, examples of which are to be found on the gateway of the Taj. On the other hand, the Chujia, or wide projecting slab cornice, which is one of the most characteristic features of Saracenic work, is exactly what is required to shelter clerestory windows and exposed walls. The Kingras, or ornamented battlements, many of which

are of very beautiful design, can be introduced effectively in place of the European parapet, while the great variety of form in the Saracenic arches affords sufficient scope for judicious selection. The style is also rich in oriels and balconies, designed in admirable taste and executed with considerable skill.

In conclusion, the author referred to a competition recently instituted in which architects practising in England were invited to submit drawings illustrating their suggestions for the external treatment of a block of offices in India, of which a plan was supplied. Certain stipulations were made with a view to ensuring that the designs should be suited to the climatic conditions of the plains of India. Although no stipulations were made as to the style of architecture which should be followed, in no instance was any attempt made to adhere to European traditions.

Mr. Hugh Chisholm said it fell to him that evening, as perhaps the oldest living architect practising in India, to propose a vote of thanks to Mr. Ransome for the able and interesting paper he had given. It was able and interesting for the reason that it went over a large surface in as few words as possible and represented with great fairness and impartiality an exceedingly difficult subject, viz., the treatment of modern architecture in India from the Anglo-Saxon point of view. As he had practised in India for upwards of thirty-five years he could say that he had never heard anyone attack so difficult a subject in such an able way, because Mr. Ransome had avoided treading on anyone's toes; but he had placed before them the one great difficulty in all Anglo-Indian architecture, which was the treatment of the external wall. The difficulty was to avoid on the one hand having an external wall so open that the building appeared to be a mere cage of architecture, frequently only half concealing the more solid building behind with no architectural pretensions at all; and on the other hand to gain dignity by the exposure of a large surface of wall without detriment and inconvenience to the people who lived in these buildings. This was the great problem in Indian architecture, and he did not think that so far it had been fairly met. Of course, that was merely his own private view. With regard to the division of the whole of India into two great classes—Hindu and Saracenic—that was so far true, but it must be remembered at the same time that India had imbibed its arts, including architecture, from five different sources. First from China on the north-west came a wave of art through Tibet and Nepal; from the same source came a wave of architecture into the south-east of India greatly modified in its travels through Burma and the Straits; thirdly came a wave of architecture from Egypt and Arabia; fourthly came a wave of architecture from the north-west frontier through Arabia and Persia; and lastly came that very curious Byzantine wave which greatly modified all the native architecture of India and culminated in that building of wonderful beauty, the Taj Mahal. He thoroughly endorsed Mr. Ransome's statement that no photograph conveyed the slightest idea of what this building looked like. It was really spiritual. They might just as well take a beautiful child with rosy cheeks, blue eyes, and golden hair, and attempt to show what she was like by photography. Now, all these styles which he had noted spread out like fans and overlapped each other and modified each other, so that it would be seen that although Hindu and Saracenic divided the architecture of India into two definite classes, yet they did not go further than the division of all European architecture into Gothic and Classic. With regard to the modern treatment of buildings—as to how far they should be Indian and how far European—this was a very difficult question to settle, and at the expense of his reputation he had discarded style in all his buildings beyond what he could get out of the natives on the spot, and he felt it would be a good rule for anyone practising in India to accept the local materials and to do the best they could with local labour, working on the traditions of Indian art, and to observe also the golden rule that the amount of ornamentation they put on the building should not exceed in ratio the value of the materials which exposed that ornament. He understood Mr. Ransome to say that the dome was not an economical form of construction, but he must disagree with him there. The cost of the dome lay chiefly in the cost of centring. The centring

was the expensive part of the dome, but if the dome was turned on true Hindu principles, without the centre, the cost of doming was little more than the cost of walling, and that the dome could be so treated he had practical experience of, because he had domes varying from 16 ft. up to 72 ft. in diameter and had never had an accident of any kind. In one case where he was turning a very flat dome there were horizontal rings, and they opened at the back, but he grouted up, and the dome was perfectly stable.

Mr. John Slater, in seconding the vote of thanks, said he could lay no claim to having had any practical experience of work in India, but he remembered, nearly forty years ago, when he was a pupil of the late Professor R. Smith, he had the advantage of seeing the drawings which he had made for some buildings in India. It was interesting to note what Mr. Ransome had said with regard to the natural building materials in India, because it could not fail to have struck anyone who had seen and known anything about Sir W. Emerson's design for the Victoria Memorial in Calcutta that he had gone to the expense of having marble from Greece for that building, which he ventured to think would be a very magnificent addition to all the buildings in Calcutta. It might be interesting to some members of the Institute to know that the great Gothic genius, Wm. Burges, in 1866 or 1867, designed a building for Bombay which was to be the School of Art there. The building was very roughly illustrated in a paper read before the Institute in 1867, and it was certainly very interesting to notice how the genius of Burges showed itself in the new conditions he had to work under in designing a building for a very hot climate. He believed the building was never carried out. At any rate, he knew that in the paper which Burges read on the building he finished up with these words: "Such is, or rather was, my scheme for a school of art in Bombay. I say 'was,' because the last advices (unofficial) from India tell me there is a report abroad that my scheme is to follow the fate of so many other schemes, viz., that it is to be put into the hands of military engineers, who are to perpetrate a copy of the building which we all so much admire at South Kensington." He happened to look that up that day, and thought it would be interesting to the meeting to know that so long as forty years ago this design had been made. Probably Mr. Chisholm would know whether it had been carried out. [Mr. Chisholm said it had not.] With regard to some of the practical points which had been touched upon as to roofs, he did not know whether anyone had tried in India the use of slag wool for keeping out the heat. He could not help thinking that in a hot climate this stuff, which was absolutely immune from the attacks of insects of all kinds, would be extremely useful, and might be used with great advantage. As to the ventilation of roofs, surely there would be no difficulty in having space between the top ceiling and the roof proper, through which the air could circulate, which should have some effect in mitigating the heat which beat upon the house. It was curious to learn that very much the same tricks were used in India with regard to pointing that they got in England. Mr. Ransome told them that the mortar when wet was so much the colour of the brick that the joints were absolutely concealed, and the workman ruled the joints according to his own fancy. They saw much the same thing in London, where the abominable practice of tuck joints existed. The walls were smeared over and the lines ruled independent of the joints. It was rather interesting to hear what Mr. Ransome had said as to the height of the verandahs. He said they must not be raised too high or the sun got in and heated the underground rooms. He remembered when Professor Smith read a paper before the Institute in 1868 or 1869 on European architecture in India he said the verandahs outside a building ought to be the full height. He supposed that practical experience had shown this was not a desirable thing. The subject was a very interesting one, and whatever they might think of the artistic character of some of the buildings illustrated, at any rate, they were exceedingly interesting.

Mr. W. H. Atkin Berry said he could not help feeling that it was impossible to appreciate fully the points of the subject without some knowledge of the country of India. It was his good fortune some years ago to visit India and to travel a little about the country, and although he had not full opportunities for actually studying

the architecture there he, of course, received some impressions, although many have been but passing impressions. One impression he very strongly received was that all attempts at European architecture there were too dreadfully European. He did not say that in any way in disparagement of the works of those who had attempted European architecture, but as showing to his mind that it was a fatal thing to attempt to transplant the characteristics of another clime and country to one so entirely different as India. Of course, apart from that there were many works in India by Europeans which were not in any sense deserving of the term architecture. They were buildings. He thought a great deal of that was due to these buildings having been carried out by men who had no pretensions whatever to training as architects. It was well known that engineers had done a tremendous amount of building, nominally passing as architecture, but they knew what engineers' architecture was. He was not saying that unkindly. It was because engineers had had such a free hand in India that there were so many failures. On the other hand, he felt that if their best architects were to put forth their best efforts to make European characteristics a success in India they would fail. He believed that to be successful in India the architect must seriously study the traditional architecture of the country. It was a very difficult subject to grasp properly, but he believed that was an essential secret of success. They would have observed from the slides exhibited that many of the later works showed that architects were convinced of that fact, and that they had made efforts to study, and while not exactly reproducing the traditional styles, designing in accordance with them, and as they had done so they had approached success. He would like to say a word on the subject of corrugated iron for roofs, and the dreadful practice of painting it red to "look like tiles." That was childish, and a failure, but he had seen corrugated iron treated very successfully in India, both in appearance, and from practical points of view. He had a vivid recollection of bungalows with corrugated iron, simply painted white, with the idea of keeping off the heat, and the effect aesthetically was very good indeed. As to hollow roofs and walls, Mr. Ransome seemed to imply that these things were unsuccessful in India, but he happened to know instances in India where it was very successful. With reference to these, he had always been under the impression that if they wanted an air-space proof against the variations of temperature they should endeavour to seal it, and not have a current pass through it. If they could confine the air they made it a non-conducting cushion. He entirely agreed with Mr. Slater with regard to slag wool, and would be surprised if Mr. Ransome told them it was not used. It was a material of modern invention, and if it was not used in India, it might well be used. The slides which they had seen showed them what was a strong characteristic of native workmen, which was their extreme patience. They had no idea of hurry or impatience, and no idea of time, but would patiently work at intricate details and never weary. As to the Taj Mahal he could only endorse the eloquent praise which had already been bestowed upon it; no photograph, drawing, painting, or model that he had ever seen conveyed the slightest idea of the great beauty of that building. One might stand for hours before that building entranced with its beauty, realising that which Mr. Ransome had put so aptly in the words "Power of simplicity." It was the power of simplicity that impressed one, and yet on close inspection they found the building would bear examination almost with a microscope, for the beauty and refinement and intricacy of its detail. On its broad lines, however, it was simplicity and power. He was a little disappointed that Mr. Ransome did not give them the benefit of a little more description of the bungalows of India on the hill stations. Perhaps he was confining himself to the more monumental subjects, but to architects in England, who were much interested in domestic architecture as applied to the Englishman's home, there was in the residential bungalow of India a most interesting subject. Many of the little hill bungalows he had seen erected without conscious effort seemed to have struck the truth naturally. A great many of these little bungalows were really most effective, but, again, there was absolute simplicity. There was no straining after effect. Like much of the picturesqueness

of English villages, it seemed the outcome of the natural desire of men to accomplish something in simple work. A great many of these bungalows were entirely the work of Europeans as regarded design.

Mr. Seth Smith said the subject had been handled by Mr. Ransome chiefly to illustrate the civil architecture of India, and not the domestic, and therefore Mr. Atkin Berry's desire might have the advantage of inducing Mr. Ransome to come again and give some information on that particular subject. In relation to civil architecture, he questioned very much whether there was any great advantage in endeavouring to copy or to develop the indigenous styles of architecture, for these styles were almost entirely ecclesiastical. Nearly the whole of the Hindu architecture was in temples, tombs, and palaces, but the palaces were not great in number, and were principally in Benares. He would be glad to hear Mr. Ransome's opinion on the point whether it was any use European architects attempting to work on the traditional lines of Hindu architecture, or would it not be better if they set aside all tradition and endeavoured to treat the thing from a scientific point of view in accordance with the conditions which were necessary? He would also like, if possible, to be referred to some source of information which would enable them to understand the construction of domes in that simple manner of which Mr. Chisholm spoke.

The Chairman suggested that Mr. Chisholm might briefly describe the construction of the dome.

Mr. Chisholm said the dome, after it was tied at the bottom with a circular tie, was perfectly stable, as they went on ring by ring. It was just like a number of men standing in a circle and leaning against each other. As long as their feet were against something to prevent them slipping they could lean down a considerable way. The moment the dome was closed in the middle it became stable. It was not quite stable as they went on with it, because of the elasticity of the material. He had a half, however, very simple. He had a half-dome going on now, which the bricklayers refused to turn out first without a centre, but when he explained it to them they went on. A half-dome was a little more difficult than a whole dome, because it did exert a thrust out until it was closed. The moment it was closed it became an arch, but during the process there was a little angle which had a tendency to fall out. If they had a good arch to take the thrust that was just as stable as a circular dome. He explained all this before the Institute a great many years ago, but it had been forgotten.

Mr. Hudson said that Mr. Seth Smith had referred to the desirability of adopting the style of the country of many years ago. It struck him that, as conquerors of India, they were making upon that soil the impress of their occupation, so that in generations to come, when these buildings were ruins, there would be the same evidence of the British occupation as they had now in their own country? It was a point which he thought must have strong force, in regard to the adoption of the traditional style, and carrying it out in the way they had. If they were not to adopt the traditional style, what was the alternative? What could they adopt as their own style at the present day to mark that impress on the soil of India?

Mr. Seth Smith asked if Mr. Ransome would give his opinion on the merits of the various competitive designs he had shown on the screen? It appeared to him that some were very beautiful and very suitable to the conditions.

The Chairman was afraid that if Mr. Ransome were to accede to the request it would lead to a long discussion afterwards.

Mr. Ransome said he thought there was insufficient time to deal with the question of competitive drawings. He thanked them for the attention they had given the paper, and was gratified that they had found it interesting. He was afraid that they might have found it a little dry, and it was a relief to him to find they were interested, while the discussion which had taken place had been of considerable use. In India they suffered from lack of discussion and lack of interest. People took up a design and said it was either ugly or pretty, but took no further interest in it. If asked why they thought it was ugly or pretty they thought that had nothing to do with the subject, if it pleased them it was good architecture, and

if it did not please them it was not. The question of the desirability of copying native work was a very difficult one indeed. He felt himself that as they occupied India they ought to leave their mark, but he also felt they ought not to leave their mark in the way they sometimes did. There was much in the native work which was very useful, and, even more, that was beautiful, and he thought they should always copy what was useful in the native work, even if the result was to make some mongrel of architecture. If they were patient in going on these lines, and working chiefly for use, and then trying to beautify, and put the style of architecture second, he thought in time they would arrive at something which would leave a satisfactory mark on their occupation of India. It was not one man's work, or twenty men's work, but, as with all other styles, it would have to grow. He had not touched upon bungalows because he could not agree that they were beautiful. He had been trying to recall beautiful bungalows, but could not. Sometimes they found an old roof left on, and if they had old shingles which had mellowed they looked very well, but he could not think of a modern one which was beautiful. He acquired one in Simla, and tried to make it beautiful, but was afraid that it was not. The only thing was to cover them with creepers, and then they looked very pretty. Europeans, in these days, spent much little time in India, and would not spend much money on the inside of their buildings. He had tried to find out instances of hollow walls in buildings in India, but had not been successful. Of course, there were double roofs, but that was not what he meant. He was talking of the ordinary flat concrete roof which was, as a rule, solid and thin. He thought if two thicknesses of concrete could be introduced that would undoubtedly lessen the temperature transmitted through the roof, but the feeling in India was that unless they ventilated the hollow space they would get no advantage from it. As regarded slag wool, it was not much used. It would be an excellent thing to put in, but things went very slowly in India, and he had never heard of it being used there. With reference to his remark about domes, he referred more to the restriction which the domed roof very often placed upon the plan. Given a certain square area to cover over, then the dome was an economical form of roof, but if they had to scheme the plan to cover the whole of the space with domes that was another matter. The vote of thanks was heartily agreed to. The Chairman announced that the next meeting would be held on Monday, February 6, when the President would deliver his address to students and present the prizes, and Mr. A. N. Prentice would deliver a criticism of the drawings submitted.

METHODS IN AMERICAN WORKSHOPS.*

This very best of these workshops, with possibly one exception, could be matched in equipment and in general method of carrying out work by single works in this country. Some of them were in no way in advance of ordinary practice here. In general, however, the organisation of an engineer's workshop in America struck the author as superior to that in similar works in England, whilst in some the organisation was in every detail admirably thought out and administered. In a modern business an American begins to make one particular machine or particular kind of machine. His whole energy is, in the first instance, concentrated upon making this machine superior to anything at the time upon the market. More than with us, he thinks that natural ability is aided by the best scientific knowledge in the design of the machine to be produced.

An American employer will see that his workmen have no reason to use their time for any purpose in which they are not skilled. His foremen will do no clerk's work. His machine men will not be grinders of tools nor designers and constructors of methods for holding and machining the work. A machine minder's business is to keep his machine moving and his tools cutting every minute of the day that is possible. It is relegated to others to design, to grind, to fetch and carry his tools, to prepare chucks, jigs, and everything requisite, so that they may be ready to the workman's hand at the time they are wanted; and

to his foreman is relegated the chief duty of seeing that the work is quickly and correctly done. It would be instructive to some here to know what proportion of the time of a factory's running is used by any given machine in actually performing the work it is designed to do. The author has seen a works where every separate job for every machine is ordered and arranged from the office staff, where every detail in the process of its machining is settled, and the number of minutes each process must occupy is displayed before the article reaches the workman's hands. In such a works a liberal bonus is paid for a saving in time, and rigorous methods are in force against those who fail to carry out the work in the stipulated time. Such methods may appear harsh, but he believes that in practice they are not so, for they are the result of accurate experience gained by an expert staff, and they recognise the enormous difference, in industry and ability, that there is between different workmen. *The able man is allowed full play for his ability, and is rewarded by a very great increase in money earned over his slower or less industrious neighbour.** In the same way, by card processes, by clocks with dials divided into tenths and hundredths, are minutes saved which a workman uses in calculating his time, and which a clerk wastes in complicated addition and multiplication of figures. Persistent energy and patience have achieved remarkable results in the organisation of cheap production in some of these workshops. This, the author thinks, is the chief difference, stated in general terms, between English and American workshop practice. In this country they are somewhat wasteful of the workmen's time; in America they are careful of it to a remarkable extent. It follows that if American engineers shall compete successfully against English engineers, it will be, in his opinion, because the organisers of their businesses know their work, and carry it out better than do the organisers of businesses here. Their workmen are in no way superior, but their skill and ability are used to better advantage.

THE BUILDERS' FOREMEN'S ASSOCIATION.

The eleventh annual dinner of this Association was held on Saturday evening last week in the Venetian Chamber, Holborn Restaurant, W.C. Mr. W. H. Fitton (Bramley Engineering Co., Leeds) presided, supported by over 250 members and friends of the Association, amongst whom were Messrs. T. H. Armstrong, — Butler, E. Carter, — Coxon, T. Faldo, J. H. Harding, W. A. Harford, McCutcheon, B. T. Price, Salter, — Shoulder, — Stevenson, R. N. Taylor (President), Thompson, Antill, and Squires, and W. Cook (Secretary).

The loyal toasts having been honoured, The Chairman proposed "The Builders' Foremen's Association." Having spoken of the antiquity of the building craft and presumably of the work of the foreman, he said that the first object of the Association was to bring together the members in friendly and social intercourse, which seemed to him a very laudable object; the next was to improve the status and dignity of the builder's foreman, while other objects were: to assist in finding employment for members who required it; to give lectures which would be useful to members in their work, and to institute a pension fund—a most important part of their work, it seemed to him. It was impossible unless they were united and joined together that these objects could be carried out, but he was glad to find that the Association had been in existence eleven years. In 1902 they had a cash balance of £204, which, at the end of 1904, had been increased to £402; and during the two years the increase in membership had been 30. As to the pension fund, it seemed to him to be the most important part of the whole undertaking. It was proposed that the fund should be to help those who had not less than 15 years of membership and who at the age of 65 should be unable to do more work. He thought that the age limit should be reduced somewhat, though that was a financial matter which must be left to the Committee. A satisfactory cash nucleus had been formed in this connection, and the profits of the social functions were devoted to this pension fund, but in addition to that he thought there ought to be a leave on the members. As an honorary member he would be glad to

pay his share towards more rapidly increasing the amount of the fund. He appealed to them for subscriptions and help to carry on the good work of the Association, and he did so with pleasure, because he saw from the data which had been supplied him that the Association was worked on a very sound basis, and it was a pleasure to help those who helped themselves. For that reason he would be glad to give them 25%, and if that was not sufficient they must come again. Their Quarterly Report seemed to embody all that was necessary in any such statement and it enabled country members to see exactly what was being done. The prospects of the Association were good, and all they needed was a little kindly help. In addition to financial help, it would be a good thing if each member during the next twelve months determined to nominate someone for membership, and as their chairman he undertook to do so.

Mr. Taylor, President, in response, said that anyone requiring a foreman would get as good a man from the Association as they would anywhere else. The Association was not a trades' union in the ordinary sense of the term, but an Association for promoting the efficiency of builders' foremen and for rendering one another mutual assistance. The first object they endeavoured to obtain by means of lectures and visits to works in progress and the interchange of ideas at the monthly meetings. The second object they endeavoured to attain by means of a contingent fund for the purpose of granting assistance to members when they were out of employment by means of advertisements. There were also funeral benefits and the pension scheme. The past year had been a very successful one and members and funds had steadily increased. Foremen who were not members ought not to fear to join the Association when they realised the amounts of the funds, and the Secretary would be pleased to give information to all those disposed to join. Thanks to the energy of Mr. Price, who started the scheme, the pension fund now stood at £44, plus contributions from the smoking concerts and the Chairman, and he appealed to them for further help.

Mr. B. T. Price then proposed "The Building Trades." The trade had had a good many ups and downs, he said, and it was now passing through a time of great depression. The building trade was to a great extent dependent on the condition of trade throughout the country, and he hoped there would be a great improvement in trade all round. Before concluding he should like to refer to a matter that was mentioned at their last dinner, i.e., as to American methods and ideas in regard to building. Some of these methods had been put before them in London and elsewhere, and it was peculiar that the tall talk they used to hear as to these American methods had ceased, and they heard nothing now of American methods, being superior to English ones. As a foreman's association, they were ready to learn and to adapt themselves to new conditions and methods, but they were conservative enough to stick to the old methods until they were assured that the new ones were better.

Mr. T. Faldo, who responded, said there was no doubt that there were many ups and downs in the building trade, and they might almost call the trade the pendulum of prosperity. The political situation had a good deal to do with trade and it was long since there had been such an upset in the political world as there was at the present time. As to American methods, there was not a respectable foreman belonging to the Association who would put a building up on American methods. Mr. Price said he was ready to learn. If they had anything more to learn they would not learn it from the Americans. The American invasion was past; there was nothing of it now in London. Since the Association had been started, the status of foremen had been considerably raised.

Mr. E. Carter then suitably proposed "The Chairman," and Mr. Fitton briefly replied. The concluding toast was "The Visitors," proposed by Mr. W. A. Harford and acknowledged by Mr. T. H. Armstrong.

During the evening subscriptions to the amount of nearly £500 towards the pension fund were announced.

THEOBALDS v. CLEMENTS. — Mr. Henry Theobald, F.S.I., of 6, South-place, Finsbury Pavement, desires us to state that he is not the surveyor who was plaintiff in the recent action of Theobalds v. Clements, nor is he in any way related to him.

* From a short paper read by Mr. A. T. Gimson before the Institution of Mechanical Engineers, on the 11th inst.

* The italics are ours.—Ed.

THE SURVEYORS' INSTITUTION.

THE following is the list of candidates who have passed the recent Students' Preliminary Examination. Of the candidates who presented themselves at the examination held concurrently in London, Manchester, and Glasgow, on January 11 and 12, the following satisfied the examiners:—

Affleck, J. C. C., High Wycombe.
Armstrong, R. E., Warming-
ton, Sussex.
Ashenden, H. W., Sneath,
Ashford.
Bagshaw, N. B., Kettering.
Baines, W. H., Burslem.
Baldock, C. A., Boscombe.
Balls, V. H., Hampstead,
N.W.
Bare, A. B., Bloomsbury-
square, W.C.
Batzler, A. E., Wallington,
Surrey.
Baxter, A. S., Wand-
sworth Common, S.W.
Bayley, L. W., Cheltenham.
Beckham, A. A., Clapham
Junction, S.W.
Biggs, W. W., London.
Bishop, H. S. C., Swindon.
Bosker, W. J., Wrexham.
Bott, W. A., Burslem.
Brassey, R. E., Bulkeley
Grange, near Malpas.
Buck, E. M., Worcester.
Budge, C. S. G., Parkstone.
Burt, H. S., Eastbourne.
Carpenter, R. H., Burgess
Hill.
Chapman, J. F., Leicester-
square, W.C.
Clark, J. B., Bedford.
Cowell, S. J., Canterbury.
Davis, J. Gargrave, near
Leeds.
Daw, H. W., Brixton, S.W.
Deane, R. C., junr.,
Worcester Park.
De Jersey, J. H. R., Mid-
hurst.
Dixon, J., Waverley,
Liverpool.
Drew, R. C., junr., Bourne-
mouth.
Duke, H. E., Sherborne.
Ebbutt, A. C., Croydon.
Evans, G. L. B., Maccus-
ling.
Gardner, H., junr., Poulton-
le-Fylde.
Gardner, P. S., Regent's
Park, N.W.
Gibbins, T. S., Titchfield,
Fareham.
Godwin, C. P., Dorking.
Godwin-Austen, R. A.,
Great Missenden.
Greenough, H., Wilsby,
Bradford.
Griffith, F. S., Muswell
Hill, N.
Hartson, W. E., Norwich.
Hedley, T. F., Sunderland.
Hobbs, W. E., Brighton.

Scottish Candidates.

Grant, A., Edinburgh.

Irish Candidates.

Duggan, C. E., Rathmines. Dunlop, C. J., Bray, Co.
Wicklow.

THE LONDON COUNTY COUNCIL.

THE first meeting of the London County Council after the Christmas recess was held on Tuesday in the County Hall, Spring-gardens, S.W., Mr. J. Williams Benn, Chairman, pre-
siding.

The late Mr. Thomas Blashill.—Sir Melville Beachcroft said he thought the Council would like to be reminded that an old servant of the Council was that day being interred—he referred to Mr. Thomas Blashill who for a number of years had been the superintending architect of the Council. He thought the Council would not like the meeting to pass without an opportunity being accorded it of expressing its sense of appreciation of the services which the late Mr. Blashill had rendered to London at a particularly difficult time when the Works Department was being instituted.

Mr. J. Burns, M.P., said he desired to associate himself entirely with what had fallen from Sir M. Beachcroft.

These remarks were sympathetically received, and the Council passed to the ordinary business.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Fulham Borough Council 1,650*l.* for erecting conveniences; Hackney Borough Council 8,935*l.* for contribution towards cost of Mare-street improvement; and 8,900*l.* for sewer reconstruction works; Lambeth Guardians 21,360*l.* for poor law purposes; Paddington Guardians 8,340*l.* for a similar purpose; St. Pancras Borough Council 3,000*l.* for purchase of land for

addition to cemetery; Stepney Borough Council 10,000*l.* for electric light installation; Stoke Newington Borough Council 1,000*l.* for contribution to cost of acquisition to Springfield-park; and Wandsworth Borough Council 12,436*l.* for paving works. Sanction was also given to the following loans:—Chelsea Borough Council 16,500*l.* for contribution towards the cost of Sloane-street improvement; Hammersmith Borough Council 300*l.* for advance under the Small Dwellings Acquisition Act, 1899; and St. Pancras Borough Council 5,370*l.* for electric light installation.

The Works Department.—The adjourned report of the Works Committee, bringing up the reports of the Bridges, Fire Brigade, Highways and Housing of the Working Classes Committees, and submitting statements of works completed during the half-year ended September 30, 1904, was then considered.

In statement I. are included accounts for works, completed in the half-year, in respect of which complete specifications and bills of quantities have been prepared. On a few of these works some small expenditure has been incurred after September 30 last, but all such expenditure has been brought into account. In addition to the works included in the statement, the undermentioned works, representing about 67,700*l.*, were completed by September 30, 1904:—Bourne estate—Artisans' dwellings on Clerkenwell-road and Leather-lane frontages—Sections 1 and 2; Kingsway—Paving, etc., works at Keen-Street; Aldwych—Paving works at Catherine-street, etc.; Aldwych—Western portion—Paving works.

The net result of execution of the works included is a balance of cost below final certificate of 10,674*l.* 3s. 31. or 10.88 per cent. on the total of the final certificates. Ten out of the eleven works have been carried out at a cost below final certificate. The total of the accepted estimates for the works in the statement amounts to 104,208*l.*, while the total of the final certificates is 98,062*l.* 16s. 10d. The total of the accepted estimates considerably exceeds the total of the final certificates. In this case the excess amounts to 6,145*l.* 8s. 2d., or 6.26 per cent. The actual cost of the works in statement I. is 87,388*l.* 13s. 7d., or 16,819*l.* 6s. 5d. below the accepted estimates; in other words, the cost to the Council of the execution of the works is less by 16,819*l.* 6s. 5d. than was anticipated, and the Council was prepared to pay. . . . The total cost of the works included in the statements now presented does not represent the turnover of the department, because much of the expenditure on these works occurred previous to the half-year in question, while, on the other hand, much of the expenditure during the six months was upon works which are still unfinished. The approximate expenditure on works executed by the department during the half-year was 252,700*l.*, as compared with 232,000*l.* in the previous half-year. The Works Committee further reported as follows:—"The number of works in respect of which full specifications, bills of quantities, etc., have been prepared, and which have been referred to us for execution and not yet included in the half-yearly statements of completed works submitted to the Council, is thirty, representing an estimated expenditure of approximately 1,390,000*l.* In addition, works representing about 2,700*l.* are being carried out on the basis of actual cost, and works to the value of 56,800*l.* have been accepted by us, but not yet referred to us by the Council for execution. As required by the standing order, we report that, so far as can at present be foreseen, we do not anticipate that the accepted estimates for any of the works in hand will be exceeded, except perhaps in the case of Old Kent-road fire-station and Poplar Technical Institute, the completion of both of which works has been delayed through causes not entirely under our control. This delay may possibly necessitate our having to report a slight excess over the amounts voted. We reported on June 28, 1904, that we had fixed at 1*l.* and 3*l.* respectively the percentages to be added, to cover general and establishment charges, to the expenditure on wages and materials charged to each estimated work completed subsequent to March 31, 1904. These percentages were fixed with due regard to the then estimated expenditure of the department for the year 1904-5; but it is now anticipated that the expenditure for the year will be higher than was estimated at the beginning of the year, the enlargement of the northern and southern high level sewers being to a great extent responsible for this increase. We are glad to

be able to report that this estimated increase has enabled us to reduce the percentages to be added to the expenditure on wages and materials charged to each estimated work completed during the year in respect of general and establishment charges, from 1*l.* to 3*l.*, as reported on June 28, 1904, to 1*l.* and 3*l.* respectively."

Mr. E. White congratulated the committee on a brighter state of affairs, but took exception to the large amount of completed work not yet reported upon. When, however, the committee claimed to have saved 10,000*l.*, it ought to be remembered that this kind of work could be done 15 to 20 per cent. cheaper than was the case a few years ago.

Vauxhall-bridge—Erection of Superstructure.

The Bridges Committee reported as follows:—"On July 5, 1904, we reported on the progress made by Mr. C. Wall under his contract for the erection of the superstructure of Vauxhall-bridge. Since that date we have been in constant communication with Mr. Wall with the object of accelerating the progress made by him, which in our opinion is very unsatisfactory. The tender of Mr. Wall was accepted by the Council on October 1903, and the formal order to commence work was given him on January 1, 1904. Under the terms of the contract the bridge should be completed by December 31, 1905; but having regard to the progress made, it has been decided that the work should be completed by the contractor for carrying on the work, we do not think it probable that the bridge can be completed within the specified time. It is to be done, efforts of a very special character will be necessary on the contractor's part, and more adequate and up-to-date machinery must be provided on the works, but up to the present he has not seemed at all willing to take steps in this direction. The Council will, perhaps, more clearly understand the position of affairs when it learns that, although more than one-half of the contract work has been done, the total value of the work executed on the bridge site is only 25,000*l.*, or barely 22 per cent. of the contract sum, excluding provision money, of 117,082*l.*, and the greater part of the more difficult work still remains to be done."

Erection of Shelters Over the Public Way.

The following recommendations of the Building Act Committee were brought up:—

The erection of an iron and glass shelter at the Bedford Palace of Varieties, High-street, Camden-town, to abut upon Mary's-terrace (Mr. B. Crowe).—Consent. An iron and glass shelter at the entrance to Bechtel-hill, Wigmore-street (Mr. W. Gave for Mr. E. Bechtel-hill).—Consent. An iron and glass shelter at the entrance to the French Hospital and Dispensary on the west side of Great St. Andrew-street, Holborn (Mr. W. Woodward).—Refused. An iron and glass shelter at the entrance to the Café Royal on the east side of Air-street, Regent-street (Mr. W. Woodward for Madame C. de Nicols).—Refused. An iron and glass shelter over the entrance to the "South London Palace" music-hall on the east side of London-road, Southwark, northward of Ontario-street (Messrs. Wyllon & Long for the directors of the "South London Palace" music-hall).—Refused.

Charing Cross Station.—The joint report of the Bridges and Improvements Committees on the proposal that the Council should acquire Charing-cross Railway Station for the purpose of widening Hungerford Bridge, and linking up the north and south systems of electric trams, was to the effect that, in view of the very large expense involved, and also having regard to the attitude of the railway company, they felt that they had no alternative but to advise the Council for the present not to give further consideration to the matter. This course was adopted without discussion, and the reference was discharged.

Housing the Working Classes.—Mr. Bruce, the Chairman of the Housing of the Working Classes Committee, stated that his Committee had in progress housing schemes for providing accommodation for 6,730 persons, at an estimated cost of buildings and plans of 322,069*l.* Buildings about to be commenced would accommodate 6,128 persons, at an estimated cost of buildings of 301,828*l.*, and the estates still remaining to be developed would provide, approximately, accommodation for 51,782 persons, at an estimated cost of buildings and plans of 2,298,695*l.*

The Committee recommended, and it was agreed, that the estimate of 500*l.* submitted by the Finance Committee be approved; and that expenditure not exceeding that amount be sanctioned in respect of the preparation of working drawings and bills of quantities for the dwellings proposed to be erected on a site in New King's-road, Fulham, for the accommodation of persons to be displaced by the Fulham-palace-road and High-street, Fulham, Improvement.

Holborn to Strand—Kingsway.—The Improvements Committee reported that they had considered several offers for a lease of lot 8, Kingsway. The most favourable of these was that by Mr. Owen Owen, who was prepared to take the property for a term of 99 years at a ground rent of 600*l.* per annum. The property has an area of about 2,340 sq. ft., and has frontages of about 23 ft. to Great Queen-street, about 34 ft. to Parker-street, and about 84 ft. to

Kingsway. They recommended accordingly and it was agreed.

Mr. White congratulated the Committee on the fact that they had at last disposed of one of the sites in the Kingsway, and suggested that it would be advisable that some of the remaining sites should be placed in the hands of some of the well-known firms of auctioneers.

Mr. Davies, in reply, said his Committee had no reason to complain of the way in which inquiries were coming in for these sites, and he saw no reason why any change should be made in the present arrangement.

The Council adjourned soon after seven o'clock.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Marylebone West.—Rebuilding of Nos. 72, 73, 74, and 75, High-street, St. Marylebone, and No. 25, Nottingham-street (Mr. F. M. Elgood for Mr. J. A. Michell).—Consent.

Peckham.—That the application of Mr. E. J. Stevens for an extension of the period within which the erection of a one-story addition at the rear of No. 62, Queen's-road, Peckham, to abut upon Burchell-road, was required to be completed, be granted.—Consent.

Hammersmith.—An addition in front of the Laithe road school, Hammersmith (Mr. T. J. Bailey for the Education Committee of the Council).—Consent.

Stepney.—Buildings upon the site of Nos. 133 and 135, Sidney-street, Mile-end (Messrs. G. Pearson & Son for Messrs. Isaacs & Samuel).—Consent.

Fulham.—A conservatory at the side of No. 42, Stevens-road, Fulham, to abut upon Ellery-street (Mr. J. Hawking).—Consent.

Hammersmith.—Buildings on the north side of Usbridge-road, to abut also upon the east side of Ormiston-road and west side of Bloemfontein-road, Hammersmith (Messrs. Palgrave & Co. for Mr. R. Le Butt).—Consent.

Islington.—Fence walls and gates, enclosing a yard at the southern end of Windermere-road, Islington (Mr. J. W. Stevens for Messrs. Knowlman Brothers).—Consent.

Kensington, South.—Two two-story oriel windows and a projecting stone hood over the doorway at No. 3, Young-street, High-street, Kensington (Mr. F. S. Chesterton).—Consent.

Lewisham.—Erection of No. 57, Sandrock-road, Lewisham, to abut upon Undercliff-road (Mr. W. H. Collier for Mr. H. J. Harrop).—Consent.

Lewisham.—Projecting wooden hoods over the doorways of two houses on the north side of Blackheath-rise, Lewisham, Westward of No. 1 (Messrs. Kennard Brothers).—Consent.

Marylebone, East.—An enclosure for bath-chairs and bicycles adjoining the main entrance to the Zoological Gardens, Outer Circle, Regent's-park (Messrs. Hudson & Hunt for the Zoological Society of London).—Consent.

Marylebone, East.—A conservatory in front of No. 38, Finchley-road, St. Marylebone (Messrs. Anscombe & Ringland for Mrs. Lupton).—Consent.

St. George, Hanover-square.—That the application of Mr. R. Armstrong for an extension of the period within which the erection of a projecting porch at No. 6, Upper Brook-street, Grosvenor-square, St. George, Hanover-square, was required to be commenced, be granted.—Consent.

Wandsworth.—Dwelling-house on the north side of Hazelwell-road, Wandsworth, to abut upon Enmore-street (Mr. J. C. Radford for Mr. J. Tozer).—Consent.

Wandsworth.—That the application of Mr. C. De Gruchy, for an extension of the periods within which the erection of additions to the Union Church, Upper Richmond-road, Putney, was required to be commenced and completed, be granted.—Consent.

Lambeth, North.—A wooden building on the northern side of York-road, Lambeth, under the South-Eastern Railway bridge (Messrs. F. Chambers & Son for Mr. W. H. Hopton).—Refused.

Hammersmith.—A house on the north side of Dunraven-street, Hammersmith, to abut upon the east side of Adelaide-road (Messrs. Boyton, Sons, & Buckmaster for Mr. J. Allen).—Refused.

Lewisham.—A building on the northern side of Ewhurst-road, Lewisham, to abut upon Salehurst-road (Mr. J. W. Webb).—Refused.

Lewisham.—A block of residential flats, at No. 155, High-street, Lewisham, of two bay-

windows at the second and third floor levels, overhanging a roadway leading out of the southern side of High-street (Mr. C. A. Geon).—Refused.

Woolwich.—A wooden porch and verandah in front of "Bliss Ashol," Southwood-road, West, New Eltham (Mr. R. Baker for the executors of the late Mr. R. C. Davis).—Refused.

Width of Way.

Camberwell, North.—A one-story building on the north side of Diamond-street, Southampton-street, Camberwell, with external walls at less than the prescribed distance from the centre of the roadway of the street (Messrs. H. King & Son for Messrs. Jones & Co.).—Consent.

St. Pancras, East.—A one-story building at No. 57, Rochester-place, St. Pancras (Mr. J. B. Pinchbeck for Mr. P. Wilson).—Consent.

Greenwich.—Forecourt fences in front of Nos. 13, 20 and 21, Queen-street, East Greenwich (Mr. J. Webster for Messrs. May & Roberts).—Consent.

Kensington, South.—Retention of a potting-shed at the rear of No. 26, Campden Hill-square, Kensington, with external walls at less than the prescribed distance from the centre of the roadway of Aubrey-walk (Mr. E. J. Burt).—Consent.

Width of Way and Lines of Frontage.

Finsbury, East.—A bay window at the nurses' home of the Royal Hospital for Diseases of the Chest, City-road, Finsbury, to abut upon Regent-street (Messrs. Young & Hall for the committee of the hospital).—Consent.

Westminster.—A deviation from the plans sanctioned for the erection of buildings on the west side of Regency-street, south side of Vincent-street, and east and west sides of Hide-place, Westminster, so far as relates to the erection of the Napier Memorial building, Hide-place, and Vincent-street with porches (Messrs. Law & Allen for the vicar and trustees of the Napier Memorial building).—Consent.

Woolwich.—An addition at the rear of No. 34, The Slade, Plumstead, to abut upon Elm-grove, with a boundary fence at less than the prescribed distance from the centre of the roadway of Elm-grove (Mr. W. Jolly for Mr. C. Terrell).—Refused.

St. Pancras, East.—That the Council do not accede to the request of Mr. C. Cox for Mr. W. Radcliffe for permission to retain a wood and class covered way at No. 142, Camden-road, St. Pancras, abutting upon Rochester-square.—Agreed.

Southwark, West.—A building on a site abutting upon the north-western side of Lambeth-road and southern side of Barbel-street (Messrs. H. F. Tasker & Slater for a community of Roman Catholic charitable ladies).—Refused.

Lines of Fronts and Temporary Buildings.

Wandsworth.—The retention of a wood and iron building on a site abutting upon the north side of Replingham-road and eastern side of Wimbledon Park-road (Messrs. Ryan & Penfold).—Consent.

Space at Rear.

Lewisham.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of two houses on the east side of Buckthorne-road, Crofton-park, Lewisham, with irregular open space at the rear (Messrs. Tompkins & Connors).—Consent.

Paddington, South.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building at Na 32, Westbourne-grove, Paddington (Mr. L. Young for Mr. J. Rosedale).—Consent.

St. Pancras.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building at the rear of the "Mother Red Cap" public-house, No. 174, High-street, Camden Town (Messrs. F. J. Bedle & Meyers for Mr. E. L. Summers).—Consent.

Formation of Streets.

Hamstead.—That an order be issued to Messrs. Farebrother, Ellis, & Co. sanctioning the formation or laying out of a new street for carriage traffic to lead from Redington-road to Bracknell-gardens, Hampstead (Sir Spencer P. M. Maryon-Wilson, Bart.).—Consent.

Lewisham.—That an order be issued to Messrs. Owen & Ward, sanctioning the formation or laying out of a new street for foot traffic only, to lead out of the east side of High-street, Lewisham, to the north side of Limes-grove (Mr. W. Stephens).—Consent.

Greenwich.—That an order be issued to Mr. J. Farrer refusing to sanction the formation or laying out of a new street for carriage

traffic out of Cedar-grove, Charlton (Mr. J. Lewis).—Refused.

Artisans' Dwellings.

Bermondsey.—A deviation from the plans sanctioned for the erection of blocks of intended dwelling-houses, to be inhabited by persons of the working-class, on a site on the south side of Abbey-street, Bermondsey, so far as relates to the erection of a one-story building upon part of one of the open spaces (Messrs. Humphreys-Davis & Co. for the South-Eastern Railway Company).—Consent.

Deviations from Certified Plans.

Kensington, South.—Deviations from the plans certified by the District Surveyor, under section 43 of the Act, so far as relates to the proposed erection of a building on the site of No. 20, James-street, Kensington-square, Kensington (Messrs. Crickmay & Sons for Mr. R. J. Bowerman).—Consent.

Building for the Supply of Electricity.

Norwood.—A transformer chamber at the generating station, Bengeworth-road, Loughborough Junction, Norwood (the South London Electric Supply Corporation, Ltd.).—Consent.

The recommendations marked + are contrary to the views of the local authority.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

The sixth meeting of the section took place on Wednesday, January 11, when Mr. W. D. Belcher read a paper upon Fire Insurance Companies' Regulations, and an interesting discussion ensued.

Mr. Belcher confined himself in the main to stating what these regulations were, adding from time to time his views and experience upon the administration of them. He divided the paper under twelve heads, those being of most importance to architects dealing with height and cubical contents, walls and partitions, flues, openings in walls, floors, roofs, protection of structural metal work, linings and ceilings, and floor openings.

Mr. Stanley Hamp, in opening the discussion, asked if regulations were compulsory, and at the same time thought many of them useless, as, for instance, that dealing with fire-resisting doors, experience generally showing they failed in their purpose from various causes. He thought that private houses were in need of regulations in the same way as factories, and also regulations were required in the matter of providing hydrants in the streets.

Mr. Max Clarke said his experience of carrying out regulations of various companies had gone to show that, after doing everything suggested by the companies, the reduction in the rate for insurance did not pay for the additional outlay. He believed that well fires were even more responsible for fires in buildings than the register form spoken of by Mr. Belcher; and the following speaker, Mr. Louis Jacobs quoted as an example a case he knew of where the heat generated by a fireplace of this type was so great as to penetrate a wall fifteen inches in thickness altogether, and blister the paint upon a wood skirting board upon the opposite side of the wall.

Mr. A. H. Belcher asked for information as to the panelling to internal enclosures, and also as to the provision of a sheet-iron back hearth (the reader of the paper said that this was an error which had crept in in having the paper re-written). He suggested that the reason that factories were not built in the country was due to the heavy rates charged by the railway companies.

Mr. C. H. Brodie differed from this view, and thought that the question of obtaining labour was the main factor. He had found the rates of some of the fire insurance companies fearfully and wonderfully different, and quoted the fact that the rate for a modern building practically answering every requirement in Southampton-row, W.C., was greatly in excess of that charged for the old building in the Adelphi, and thought that benefit to the insurer would accrue by a healthy competition in rates amongst the companies.

Mr. J. Sheppard, of the North British Insurance Company, thought that architects should be willing to build as closely as possible to the insurance companies' regulations, not because the actual loss by fire was so great, but because loss of time in resuming business was in a very great measure counteracted, and nowadays time meant money.

Mr. A. E. Munby considered that tables

showing comparison between cost of companies' requirements and saving in rates of insurance were much to be desired—an opinion shared by all present.

The Chairman (Mr. H. Gregory Collins) then called upon Mr. E. O. Sachs, as "special visitor," to sum up the discussion.

Mr. Sachs opened his remarks by directing attention to the fact that fire insurance companies were not philanthropic institutions, and their method was to give a rate on the "risk" "as they find it" completed, and under no circumstances would they officially fix a rate before completion. He considered that too little thought was expended upon the question of vertical risk in the question of fires, and regarding the proposed amended regulations of the new Building Act shortly to come before Parliament, he thought that the increase in compartment capacity, if allowed, would be a step backwards. As showing the divergence of views on fire questions, armoured doors, so popular with our insurance companies, were not officially allowed as fire-resisting doors in either Glasgow or Berlin—two cities where considerable attention was being paid to fire prevention. Sprinklers should be made much more use of. He considered that the companies gave a very liberal rebate for their use. Hard terra-cotta with thin webs was now generally recognised by those competent to judge as not a suitable material for giving full protection to structural ironwork. The need for some comprehensive scheme for power to cut off gas in case of a fire was shown by the recent fire in Piccadilly and the shop explosion in Southampton-row. The difficulty spoken of by Mr. Hamp, when alluding to the Paris Bazaar fire, in obtaining a quick supply of water when hydrants were at a considerable distance off, was capable of solution in a great measure by the use of chemical engines such as those employed by the Liverpool Fire Brigade. Mr. Sachs next explained the rate upon which the insurance companies subscribed to the London Metropolitan Fire Brigade. As some of the speakers had called attention to the possible danger of using the "well" type of fireplace in alterations of old mansions, he might state that he had been given to understand that the fire at Sandringham, in which the Queen had a narrow escape, was due to a fireplace of this kind. As to the suggestion of one speaker with regard to the cutting of rates, there were non-tarif companies, he believed, which did business on these lines, but with two or three notable exceptions they were not generally recognised as sound business institutions, and considerable risk was run in insuring with them.

Mr. W. D. Belcher briefly replied, and the meeting then terminated with an unanimous vote of thanks to Mr. Belcher and to Mr. Sachs.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—At a meeting of the Edinburgh Architectural Association, held on the 18th inst. in the Association Rooms, George-street, Mr. H. O. Tarbolton presiding, a paper on "The Electric Lighting of a Country House" was read by Mr. Mathew Buchan. At the outset the lecturer pointed out that practically the only difference in the lighting of a town and a country house was in the method of supply. In the town they were supplied with a current from the public supply, whereas in the country a supply had to be made on the estate. Dealing with the interior of the house, he showed the different systems of tubing and wiring, and strongly advocated the iron or steel "draw-in" tube system. After describing the different methods of making electricity, Mr. Buchan concluded by giving an idea of the cost of the various systems.

YORK ARCHITECTURAL SOCIETY.—The annual dinner of the York Architectural Society was held on the 17th inst. in the White Swan Hotel, Pavement, when Mr. Herbert Davis, F.R.I.B.A., of Scarborough (President of the Society), occupied the chair. The loyal toasts having been honoured, the President delivered an address, in the course of which he said: When a young man, however eminent he may easily have become in any other profession, and whatever claims he may have to public confidence, becomes a member of our body, he has much to learn, and much to endure. Little does he know of what he will have to encounter. He may at the completion of his articles have received a thorough education as

an architect, but he is unaware of the difficulties which must attend and embarrass every effort to render what he may know available and useful when he commences practice. He may be upright in all his dealings, and strong in the belief of his own integrity, but he cannot even dream of the ordeal to which he will be exposed, of how he will have to resist the temptations which will beset him, of that sensitive shrinking from undeserved censure, which he must learn to control; of the ever-recurring contest between a natural desire for public approbation and a sense of duty to his profession, of the injustice he must be content to meet with, even from his clients (who should be his friends), imputations on his motives, the sneers of ignorance and malice, all the manifold injuries which partisan and private malignity may shower upon his unprotected head. All this, if he would retain his integrity, he must learn to bear unmoved, and steadily uphold the objects and aims of his profession, sustained by the reflection that time will do him justice, and that his individual efforts and aspirations will be rewarded by the knowledge that he has tried his best, and that the evidence of the buildings which he will leave behind him, will do some little good to the following generations of architects and the architectural education of the public generally. I have always said that architecture is not, and never can be, placed in the same plane as the arts of sculpture and painting. The architect is too much fettered by the conditions under which he has to work to be called an artist pure and simple. When consideration is taken of the facts that there are by-laws to be complied with, local materials to be utilised, commercial considerations to be taken into account, and clients' wishes, however mistaken they may be, either combated with, or agreed to, I think you will agree with me that the practice of architecture is too fettered in its scope to be compared for a moment with the arts of the sculptor or the painter. It is the business of an architect first and foremost to give his client a building suitable for the purpose for which it is being built and also in addition, if the building is for business purposes, to ensure that his client is to receive a good yearly return for his outlay. When an architect has been successful so far (the majority of our profession as it now exists I am afraid say that it is far enough) then it is his duty to his profession to so clothe and shape the natural ugliness of his efforts that the final result will be received with delight by his brother architects, by something less than indifference by the public, and with at least tolerance by the sculptor and the painter. I think, gentlemen, that we may congratulate ourselves on the further developments of architecture during the year. In fact, the development during, say, the last ten years, has been so very remarkable, and it still continues to be so, that we shall have, very shortly, I hope, a national style which will stamp English architecture of this period wherever it may be built on the face of the earth. This development is due to my mind to the public at last realising the fact that architecture is a profession requiring the services of educated men, to conduct and direct the various trades and businesses which come under its management. . . . Now, I should like to say a word or two on a subject which is always cropping up in the public press, I mean that of illicit commissions. How is it that these accusations are made? To my mind it is not because of the real existence of them; they may exist, but if they do so, it is not to any great extent, and then only among a class of men who we as a body would soon to call members of our profession. The reason, I think, is that so many architects are such horribly bad business men, that the mistakes made by them give rise in the minds of their clients to the thought that their interests from a business point of view are not being attended to, or that the laxity and indifference that is shown has some other underhand explanation. I do not believe that these commissions are offered, and much less received, to anything like the extent that we are led to suppose.—Mr. A. Pollard then proposed "The Royal Institute of British Architects and Allied Societies." He thought that they in the provinces were very much indebted to the Royal Institute for the way in which they had extended the hand of fellowship to them. They had taken in hand many knotty points, and had solved them for the benefit of the profession at large. They had sent out letters calling attention to the fact that

in many towns and cities works of great magnitude were passed on to the borough engineers. Probably some of them might be capable of carrying out the work and doing it creditably, but he was within the mark when he said that 75 per cent. of the corporate surveyors were not equal to the task. It might be from a spirit of economy that the work was passed on to officials and for the saving the ratepayers' money, but how frequently was it the reverse? A few pounds was saved in commission, but it was spent ten times over in notifying mistakes, and it finished in a very unsatisfactory production. He trusted that the Royal Institute would not allow the question to stand where it was, and he would strongly recommend them going to the corporate bodies until they saw fit to give the work into the hands of professional men.—Mr. Butler Wilson responded, and referred to the registration of qualified architects. He had the honour to be a member of a Committee of the Institute formed for the preparation of a scheme for the statutory qualification of architects. That Committee was appointed in June of last year, and when he stated that many meetings of the Committee had been held and that a draft Bill was almost completed, they would see that in the interval the Committee had not been idle. The members of the Institute had returned a registration Council, and he thought that they should be informed that the Council which had held out pledges to the electorate, were agitating themselves keenly in the matter which they were returned to deal with. For his own part, he should never cease to use his best efforts in the cause of registration, and he felt sure that the same feeling actuated every member of the Council. Mr. Pollard had referred to the work of a Committee of which he (Mr. Butler Wilson) was a member, which dealt with the question of municipal surveyors and engineers being entrusted with architectural work, and the undesirability of work of that kind being placed in the hands of surveyors and engineers. That Committee had placed their report in the hands of the Council, and they had communicated with the municipal authorities throughout the country. As far as he knew no reply had been received, but that did not prevent the Council from pursuing the question. There could be no doubt that the question of architectural works being designed and executed by architects would have to be constantly pursued by the Institute if architects were to be properly represented.—Mr. R. P. Oglesby proposed "The York Architectural Society," and the President responded.

NOTTINGHAM ARCHITECTURAL SOCIETY.—The annual dinner of the members of the Nottingham Architectural Society at the Victoria Hall, on the 19th inst., was preceded by a business meeting, at which the principal subject under consideration was a proposal to support legislative action by the Royal Institute of British Architects to provide for the statutory qualification of architects. Lieutenant-Colonel A. W. Brewill, President of the Society, occupied the chair. The Chairman said the registration of architects was an important question, and a Bill was being drafted to lay before the Council and members of the R.I.B.A., ultimately to be submitted to Parliament to obtain statutory powers, under which in future all persons practising as architects should be duly qualified men. He introduced Mr. Cross and Mr. Hubbard, of London, to read papers on the subject. Mr. Alfred W. S. Cross, M.A. (Cambridge), in the course of his paper, considered the present state of architecture and of the architectural profession; the Royal Institute of British Architects—what it had accomplished and where it had failed; the statutory qualifications of architects; and the reformed profession. To him it appeared that the present state of affairs was unsatisfactory, because while the works of modern architects sometimes displayed a certain amount of creative power and originality this attribute was very rarely found in combination with architectural scholarship, by which he meant an intelligent appreciation of the true principles that formed the foundation of styles and were exemplified in the glorious buildings of ancient Greece and Rome. The proposed scheme for closing the door of the profession to unqualified men by means of registration was due in a large measure to the Institute itself in having been indifferent to grievances of ordinary members who realised how difficult it was under existing conditions

to penalise unprincipled or unprofessional conduct.—Mr. George Hubbard, F.S.A., said, as a London practising architect and as a Fellow of the Council of the Royal Institute of British Architects, he was anxious to know what the feeling was in the provinces in respect to the registration of architects. It was essential that the Bill should be framed so as to embody the best and highest traditions and interests of the profession, both in London and the provinces.

The profession was so constantly being recruited by the untrained and incompetent that, both for the sake of architecture and properly-trained men, steps should be taken to foster the one and protect the other. This could only be done by compelling those who aspired to practice to prove their qualification before being allowed to do so. Since the institution of a compulsory examination for Associates in 1882 there was no question as to the superior class of men who had joined the Institute or as to the character of their work. It must not be forgotten that an architect's work was a lasting monument which eloquently expressed not only the individual mind which conceived it, but it went to show the general civilisation of the nation. Every ignominy conceived and executed building tended to lower the general instincts of all beholders, whereas the refined work of the cultured architect was ennobling from generation to generation. He maintained that the R.I.B.A. was the proper body to bring a Bill forward.—After some discussion, on the motion of Mr. Bromley, seconded by Mr. Heazell, a resolution was agreed to in favour of registration.—At the annual dinner the President gave the loyal toast, which was duly honoured. Subsequently the toast of "The Master Builders' Association" was proposed by Mr. A. N. Bromley, and responded to by Mr. Fish. The toast of the evening, "The President and the Nottingham Architectural Society," was cordially proposed by Dr. Boobyer, Medical Officer of Health for Nottingham. Proceeding to refer to legislation respecting underground bakehouses, he said after the law was passed action was taken in Nottingham by members of a sub-committee of the Corporation, the result being that 105 underground bakehouses were discovered, half of which could comply with the requirements and the other half could not. The committee undertook the inspection of the whole of these houses, and they were put into a satisfactory condition in the course of six months. There was hardly any disagreement on the part of the property owners with the decisions of the committee, and for his part he had to acknowledge having received a large amount of assistance from members of their profession. The President, in reply, said the feeling of friendliness among the members of the profession increased daily. The toast of "The Visitors" proposed by Mr. Sutton, and responded to by Mr. Cross and Mr. Hubbard, concluded the speech-making.

ARCHAEOLOGICAL SOCIETIES.

BRITISH ARCHAEOLOGICAL ASSOCIATION.—A meeting was held at the rooms in Sackville-street, Piccadilly, on Wednesday, the 18th inst., Dr. W. de Gray Birch, F.S.A., Treasurer, in the chair. A paper on "Norman Art and Architecture in Sicily" was read by the author, the Rev. Henry Cart. Perhaps a more correct title for the paper would be "Art and Architecture in Sicily under the Normans," as of purely Norman architecture, such as we are accustomed to see in England and in Normandy, there is very little, if any, to be found in Sicily. The principal Norman monuments, said Mr. Cart, are at and in the neighbourhood of Palermo, though throughout the island one comes unexpectedly on faint traces of the Norman occupation in the most unlikely and unlooked-for places. In picturesque language Mr. Cart described the beauty of Palermo as seen from the harbour, the town, rising gently in a succession of terraces, studded with buildings, towers, and cupolas intermixed with groves of orange and lemon trees to the centre of a great amphitheatrical plain, whose wondrous fertility so impressed the Norman conquerors that they carried it into luxurious parks and gardens, and reared therein sumptuous palaces and summer pavilions and ornamental fountains of running water. One of these palaces called the Zisa is considered by some to resemble the Alhambra, but the author contended that it has a specially distinctive character of its own which he calls Arabo-Norman. This palace and another

called La Cuba, now a cavalry barrack, were constructed originally upon one and the same plan, and were large rectangular buildings flanked by square towers. The ground floor consisted of a large central hall, really a sort of vestibule to the apartments, most elaborately decorated with geometrical patterns in stucco and mosaics with somewhat crude colouring of sky blue, copper green, deep black, and gold. Through the midst of this hall, or vestibule, runs a stream of pure water flowing in a marble channel from a very ornate fountain, having in the wall above it a well-preserved mosaic frieze, the subject of which may well be Norman, representing as it does alternately twin pairs of archers and peacocks, but from the stiffness of the design seems to indicate a Byzantine source. One of the most interesting groups of royal sepulchres in the world is that of the tombs of the kings in the Cathedral at Palermo, which, notwithstanding the barbarous nature of the several restorations the edifice has undergone, happily remain undisturbed. The small but exquisite chapel of the Royal Palace, the Capella Palatina, is the gem in the author's opinion, of all Palermo. It is a sanctuary more beautiful than the Venetian S. Marco, and more resplendent with mosaic than the lovely little mausoleum of Galla Placidia at Ravenna. It was founded in 1132 by King Roger, and was consecrated in 1140. In the archives is preserved the deed of consecration bearing the date 1140; it is written in letters of gold on a thin plate of silver. The Cathedral of Monreale is described as the most remarkable example of the mixture of styles which existed under the Norman Kings. It is of Latin form, with a Roman colonnade, Byzantine mosaics, Greek sculpture, and Saracenic and Norman details. The mosaics at Monreale are, in point of workmanship, far superior to those of the Royal Chapel, but, being spread over a larger surface, there is not the same splendour and warmth of colouring. The church at Cefalu and the mosaics which are its glory were described; they are supposed to be in point of execution the finest in Sicily, but, in the author's opinion, after Palermo and Monreale, were distinctly disappointing. An interesting discussion followed the paper, in which Mr. Hubbard, who had spent many months in Sicily studying the architectural characteristics, Mr. Patrick, Mr. Compton, and the Chairman took part.

METROPOLITAN ASYLUMS BOARD.

THE usual fortnightly meeting of the Managers of the Metropolitan Asylums District was held at the offices, Victoria Embankment, on Saturday last week.

Joyce Green Hospital.—Among the correspondence received from the Local Government Board were copies of an order authorising the execution of certain painting works at this hospital at a cost not exceeding 7,000l.—It was agreed to pay the sum of 600l. to Messrs. Leslie & Co., Ltd., the contractors for the erection of this hospital, for certain work "executed by mistake, and without the architects' sanction or order."

London County Council Loan for the Year.

On the recommendation of the Finance Committee, it was agreed to inform the London County Council that, subject to the sanction of the Local Government Board, the following were the estimated loan requirements of the Managers (to be inserted in the London County Council Money Bill) for 1905:—(1) For the year ending March 31, 1906, 275,000l.; (2) for the six months ending September 30, 1906, 75,000l.; total, 350,000l.

Annual Painting Works, etc.—The Works Committee reported that they had received from the Hospitals Committee particulars of the cleaning and painting works required at certain of the Board's institutions. The Engineer's estimate of the cost of the works at the Eastern Hospital was 525l.; at the North-Eastern Hospital, 392l.; at the North-Western Hospital, 637l.; and at the Brook Hospital, 1,132l. In the case of the first three institutions the Committee had arranged that the work should be carried out by temporary labour, but in the case of the Brook Hospital it was agreed to invite tenders, and Messrs. Taperell & Haase were appointed to take out quantities.

Belmont Asylum.—The Works Committee reported having sanctioned further variations of Messrs. Enners Brothers' contract, at an estimated net cost of 278l. 5s., of which 182l. was for the replacement of corroded gas mains and pipes. The amount of the contract was 15,730l., and the value of extras previously reported, 482l.

High Wood School.—Early in December the

Works Committee reported that they had been unable to obtain from Messrs. C. & W. Henman the architects' order for variations and summary of accounts in connexion with Messrs. McCormick & Sons' contract for the erection of this school, and a copy of the Committee's report was forwarded to the architects, with a request that they would furnish the required information without delay. The Committee now reported that they had received a reply in which the architects expressed regret for the delay, and stated that they had the matter in hand. The Committee had not, however, received the required information.

Wages to Painters.—The Committee reported upon a letter received from the National Amalgamated Society of Operative House and Ship Painters and Decorators in respect of the complaints made to the Board with reference to the dissatisfaction which existed in respect of the rates of pay received by the men employed in painting at the Joyce Green Hospital. The Committee stated that it was not correct, "as intimated in the last paragraph of the Society's letter," that any coercion or compulsion whatever was used to induce the men to sign a certain document.

Fifty Years Ago.

THE NEW COMMISSION OF METROPOLITAN SEWERS.—A general court was held on 16th inst. Sir John Shelley brought into special notice a subject to which we have strenuously drawn attention, namely, the fact that the Commissioners of Sewers are virtually and actually not Drainage Commissioners. Mr. Thwaites added a new instance of what we have also pointed out—that tenants will rather submit to be without drains, and to suffer from all the abominations of cesspools, than set what little *passive* power the commissioners may have to work for the amendment of these crying evils. Something must be done about it—that seems very clear. A discussion was then begun on the ventilation of sewers, which continued for five hours, and was then adjourned.—At an adjourned meeting, held on Monday, 22nd, the court agreed, *nem. con.* to adopt the plan of low level sewer and branches for the drainage south of the Thames, proposed by the late Mr. Frank Forster, and for parts of which tenders had previously been obtained. The unanimity which prevailed in a court of incongruous opinions, has been ascribed, to a great extent, to our article of last week.—*The Builder*, January 27, 1855.

Illustrations.

SKETCHES IN ENGLAND.

THE large interior sketch is a study of York Minster from the south transept, looking towards the choir.

The first of the small sketches is a study of the Perpendicular doorway, the north aisle of the nave, and the towers of the west front of Beverley Minster.

The second is a study of the west façade of St. Mary's Church, Beverley.

The remaining four sketches are sketches of York Minster from different points of view.

I made the above-mentioned sketches while travelling on the Royal Academy Studentship.

JAS. B. FULTON.

UNIVERSITY COLLEGE PROPOSED SCHOOLS, HAMPSTEAD.

WE give this week the plans, elevation, and section of the design by Mr. Arnold Mitchell which obtained the first premium in the competition for the proposed new University College Schools at Hampstead.

The following extract from the report accompanying the drawings explains the architect's intentions:—

"The school is planned in three blocks, connected by covered ways. The central block is entirely occupied with provision for hall and class-rooms. The left wing includes the dining-hall and service department. The right wing includes the science and art rooms.

This arrangement permits, without waste or inconvenience of plan, the utilisation of the considerable fall in the ground.

Every class-room has sun upon it at some hour of the day.

Every class-room has left light for every scholar.

Every class-room has at least one window carried right up to the ceiling.

Every class-room has at least 18 ft. of superficial area to each scholar.

Every class-room has a space of not less than 7 ft. 6 in. between the front row of desks and the fireplace wall opposite.

Every class-room opens directly off the hall.

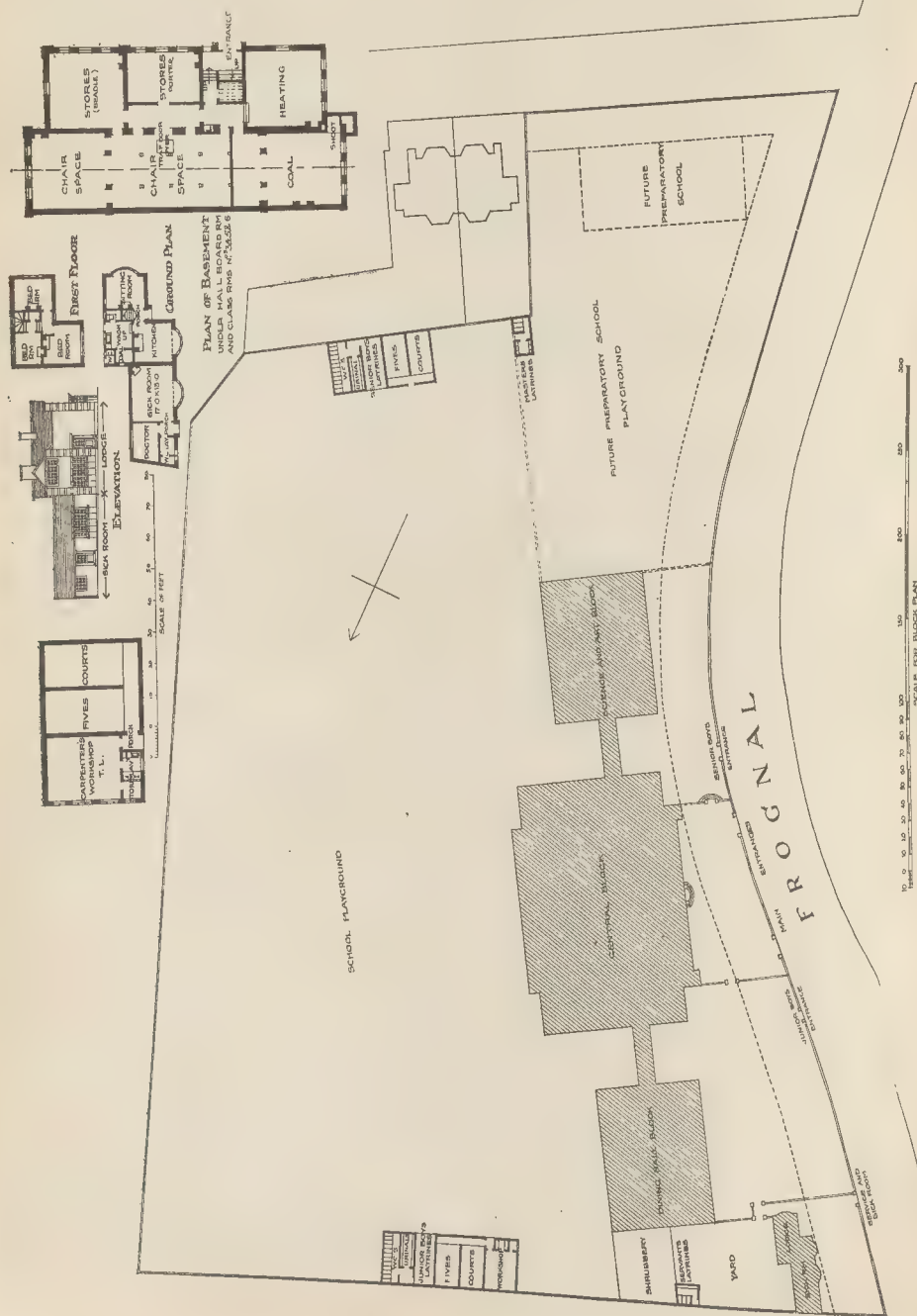
There are no corridors in the main teaching block; adequate supervision is thus secured. The hall is lit by clearstory windows on all four sides. The accommodation is equally divided into senior and junior schools. Both have their own entrance. The dining hall provides for 300 dining at one time.

The materials proposed to be used would be Chesham multi-coloured red bricks with stone dressings; the stone, Monks Park or preferably

Doulting stone. The wall throughout internally to be faced with a dado of glazed bricks.

All floors would be of concrete cement with either wood blocks or mosaic paving.

Heating in class-rooms would be by means of open ventilating fire grates, elsewhere with low pressure steam. Foul air would be extracted from class-rooms by means of extract fans in all stacks, elsewhere by electric exhaust fans.¹⁷



COMPETITIONS.

ELEMENTARY SCHOOL, NORTHWICH.—In a limited competition for this school the assessor (Mr. H. Bewick, County Architect for Cheshire) has placed first the plans of Mr. A. E. Powles, of Northwich, and they have since been accepted by the committee. The estimated cost is 10,500*l.*

HOME FOR THE AGED, LAMBETH.—The first premiated design in the recent competition for the conversion of a portion of school premises into Home for Aged Poor, Lambeth, was that submitted by Mr. E. C. Beaumont, 78, Fleet-street, E.C., and the second was by Mr. W. M. Weir, 17, Victoria-street, Westminster, S.W.

LIBRARY, WHITEHAVEN.—The new Carnegie Library at Whitehaven will consist of a lending library for 12,000 volumes, a reading-room for 66 readers, a juvenile room, reference library, magazine room, small lecture hall, librarians' and committee rooms, and librarian's house. The cost of the building is estimated at 4,000*l.*, exclusive of furnishings. The architects are Messrs. Greig, Fairbairn, & Macnevin, 31, York-place, Edinburgh.

Books.

Lockwood's Builders', Architects', Contractors' and Engineers' Price Book for 1905. Edited by FRANCIS T. W. MILLER, A.R.I.B.A., London: Crosby Lockwood & Son, 7, Stationers'-hall-court, Ludgate-hill. 1905.

WITH commendable enterprise, the publishers of this new standard work have produced the new volume somewhat earlier in the year than usual. It is therefore the first of this class of year book to appear. The state of trade during the past twelve months being practically similar to that of 1903, little in the shape of revision was necessary, but where this was requisite, it has generally been done with the same thoroughness as hitherto. This careful annual revision, based upon the practical rewriting of the work some years ago, has placed it in a position amongst builders' price books hardly dreamt of in connexion with the work as originally produced. We are glad to see that the price of bricks, as a basis of the price of brickwork, has been reduced from that obtaining a few years ago, when it was at phenomenal height, although we can hardly reconcile the method of pricing given in the heading with the reduced prices of labour and materials. We should like some indication as to the amount of discount from some given as to the list prices; list prices giving little indication of the true value of the various articles. This question of list prices and prime costs is a very vexed one, and leads to many disputes. The Conditions of Contract of the R.I.B.A. are fairly explicit, leaving open the question of cash discounts only. In dealing with invoices, it is somewhat surprising frequently to see what a tradesman professes to allow for prompt payment. The sooner the question is definitely settled the better, although most surveyors have a limit in their own practice as to what they will allow under this head. To revert to the book, it is perhaps sufficient to say that the new volume fully maintains the reputation the work has gained.

Sketches on the Old Road Through France to Florence. By A. H. HALLAM MURRAY, accompanied by HENRY W. NEVINSON and MONTGOMERY CARMICHAEL. London: John Murray, 1904.

THIS is a book *à trois*; the illustrations by Mr. Murray, part of the literary portion by Mr. Nevinson, the rest by Mr. Carmichael. From our point of view, however, the value of the book lies mainly in the illustrations. Mr. Murray's original watercolours for these were exhibited a few weeks ago at the Fine Art Society's Gallery, when we fully expressed our opinion of their artistic beauty and finish. We have equal praise for the manner in which they are reproduced. Such colour-printed illustrations are seldom seen, in English books at all events, and it is evident that no pains or cost have been spared over them. A note on the subject informs us that they have been printed by Messrs. André and Sleigh in their latest development of the photographic three-colour process; and, to avoid the disagreeable effect of the highly burnished paper often used for this purpose, they have been printed on a specially prepared plate paper. A description of the process is given, for which we refer the reader to the book. It has certainly been most

successful as far as colour-printing can be successful, and the result is one of the most beautifully illustrated books we have ever seen. As we observed when reviewing Mr. Murray's exhibition, the majority of the pictures deal with architectural subjects, and architecture could hardly be better treated pictorially than it is here. Many architects may be glad to have the book solely for the illustrations.

The literary merit of the book is also high. The style of writing of both authors has an ease and charm, and though it is not a book of serious architectural or archaeological study, there are a great many interesting descriptions of reflections on the places visited. Mr. Carmichael gives a capital description of a visit to the Carrara marble quarries, where he suggests that sculptors should occasionally come, if not to choose their marble, as it is said that Michelangelo did, at all events "to come into contact with marble in the rough; it would give new inspiration at home to their marble in relief." In regard to the leaning tower of Pisa, he thinks that the sensational fact of its leaning has rather blinded visitors to its remarkable architectural beauty. There are notes on a good many out-of-the-way places, which may be useful as suggestions to travellers in Italy. A good deal of the book is purely literary in its interest, and therefore not so much within our professed province, or we should deal with it more at length. But it is all pleasant reading, and never dull for a moment. Being a book rather sumptuously got up, besides the attraction of the beautiful illustrations, it is particularly suited for a gift-book, in which sense we may recommend it to the attention of anyone who is wanting to choose a present for a relative or friend.

Hispano-Moresque Ware of the XVth Century.

By A. VAN DE PUT. *The Art Workers' Quarterly*. Chapman & Hall. London: 1904. "A CONTRIBUTION," so the author calls it, to the History and Chronology of this Art in Spain, "based upon armorial specimens." Very fortunate is it that there are so many armorial specimens. Very fortunate (for the moment) that chivalry died so hard in Spain, for it affords us valuable clues as to more than one branch of the arts of that land. Yet in this very survival of decadent chivalry, and in its consequent sterilisation of social and political progress, lies the reason for the foreigners' ignorance of Spain, for the few exports of that land, for the rarity—this side of the Pyrenees—of examples of its ancient arts and crafts. Although Spain was once the dominating Power of Europe, Spanish mediæval MSS. are rarest of rare books out of Spain, Spanish printing has been hardly noticed, Spanish pottery only beginning to assume any importance in the field of ceramic studies. The book before us is avowedly a piece of pioneer research, which, since the examples are almost all taken from English collections, it is the more surprising is but now undertaken.

For some reason—probably the almost superhuman efforts of the Church to check the spread of religious disaffection in the XVth and XVIth centuries—we know rather more about Spain in the XIIIth and XIVth centuries than we do of it during the succeeding hundred years. In the work under review M. Van de Put pretends to present something like a connected, if tentative, survey of the development of XVth century Hispano-Moresque ware—this, for all practical purposes, means "lustre" at its best. Now "lustre" flourished at Bagdad in the IXth century after Christ, and is very likely of much earlier origin. The art spread rapidly through Moslem nations, and if Edrisi, writing before 1154, means lustre by "Golden Pottery"—as he almost certainly does—(M. Van de Put quotes a French translation) it was actually being exported from Spain in the XIIIth century as the product of Moorish potters. In the XIIIth century the building of the great Alhambra yielded considerable opportunities for ceramic designers. The tiles there observed, and the style and workmanship of the one surviving Alhambra vase, point to Malaga as the provenance. A certain dish at St. Petersburg, claimed to range with the above, bears the Malaga mark. By 1530 this particular ware (Malagan) had practically lost its reputation.

And now we enter on controversy. Not a few writers have taken the view that Majorcan (Majolica) is the correct name for the pottery, which, shipped to Italy—in particular to Pisa and Siena—gave the inspiration to the great

masters of Italian *faience* in the XVth and XVIth centuries.

On p. 39, *et seq.*, M. Van de Put sets out the evidence for the supposed *fabrique* at Inca, in the island of Majorca, and certainly persuades us that Davillier, upon whom the authority for the Majorcan contention most certainly rests, was mistaken, and perhaps a trifle careless, archaeologically. It appears tolerably certain that the early European lustre was of Spanish origin, and that its shipment in the Balearic vessels had probably led to the notion that the art hailed from one of the islands of that group.

We must not spoil the perusal of M. Van de Put's text by laying bare the treatment of his subject, to which what we have already said may be taken as introductory. His work is deeply interesting and admirably written, and readers who are also students will find references given throughout the work to authorities consulted, and will be gratified to discover at last a reliable index. The general method of describing the specimens of pottery cited is that of the *Catalogue Raisonné*, and it is at once clear and concise. A sketch map giving the chief centres of manufacture is inserted opposite p. 20.

The illustration plates, three of which are in colours, are, upon the whole, good, but, of course, printed upon the usual bad shiny paper which certain publishers continue to declare is the best for the purpose, in spite of the Society of Arts report and the continual practice of the Clarendon Press. The text itself is very well printed, and the work is sensibly and prettily bound.

Picturesque Middlesex. By R. H. ERNEST HILL and DUNCAN MOUL. London: F. and E. Robinson & Co. 1904.

MR. HILL describes, and Mr. Duncan Moul illustrates in this book the numerous villages that lie outside suburban London on its north and west sides, a district bounded on three sides by the rivers Thames, Colne, and Lea, each giving added charm to those places that happen to be placed on or near them. The scheme adopted has been to begin at the southern boundary at Hampton Court, gradually working up the Colne valley to the county border near Rickmansworth, then passing east through Edgware and Hendon to Enfield and the Lea. With the ever-increasing facilities of transit by train and tram the portion of the county lying west and north-west of the Metropolis is better known than it was a few years ago. Some disadvantages must necessarily result from the opening-up of what have hitherto been very secluded spots, and the book under notice will be an interesting possession for those who already know the charm of this county, or for those Londoners who wish a guide to pleasant places almost at their doors. Even the brickfield district that forms such a feature of the Great Western Railway between Southall and West Drayton, if apparently uninteresting, will well repay the searcher after the picturesque; the Grand Junction Canal, the bridges, with slowly-moving and highly-coloured barges, with often a background of trees, provide pictures which the artist need not despise. Nearly every village has its picturesque cottages and an interesting church. Some of these latter, chiefly those nearer London, have suffered from restoration or rebuilding, but nearer the county boundary, especially on the west, much remains of interest architecturally—the fine Norman work at Harlington and Harmondsworth, the monuments ranging from the XIVth century brass to the late Renaissance tomb at Harrow and Harefield, being but a few points among many. Some interesting late glass will be found in the little church at Great Greenford and interesting fountains at West Drayton, Hayes, and Hendon. Of domestic work the most important perhaps are the grand barn at Harmondsworth, 190 ft. long, and the remains of a camera of the Knights Hospitallers near Harrowfield. At this latter village is a good group of almshouses; smaller ones are to be found at Whitechurch. Most of the foregoing are either illustrated or described in this book, and all lovers of the Home County will find it a handy book of reference. A small map would have been a useful addition to the work—we would suggest it in future editions.

Hampstead Wells: A Short History of Their Rise and Decline. By GEORGE W. PORTER. London: George Bell & Sons. 1904.

THIS little book recounts the story of the ancient wells and springs of Hampstead. The author,

who is a trustee of the Wells and Campden Charity (1698), gives a short description of the geological features of the neighbourhood, of the former supply of drinking-water from the north and north-west of London, and of the establishment of the Hampstead Water Works Company, who, in 1692, leased from the Corporation of the City the ponds on East Heath whence, as well as from the Highgate ponds, they conducted the unfiltered water to a reservoir now the sight of Tolmer's-square, Hampstead-road. The New River Company constructed the reservoir near the Whitestone pond when they took over the works fifty years ago. Of the many old wells, springs, and conduits cited by Mr. Potter there was one which we ourselves distinctly remember at what is now the summit of Fitzjohn's-avenue where, being then in the fields, many a time we have seen the water-carriers descend the steps and dip their buckets into the pool beneath the old arch. Known as the Shepherd's Well, it is illustrated in Hone's "Table Book," vol. iii., 1841; the water did not freeze, and was not chalybeate. The chalybeate springs were in another part of the parish, at Well Walk, rising from a marshy tract whereof six acres constitute the corpus of a trust set up for the benefit of the local poor in December, 1698, by the Earl of Gainsborough (then a minor) and his mother the Countess. The grant specifies the "medicinal waters called the Wells," around which one John Duffield shortly afterwards built the Spa which, with its pump-room, assembly-room, and gardens, with bowling-green and raffish shops, soon became a highly popular resort. With the aid of plans and illustrations Mr. Potter traces the positions and subsequent uses of the Spa buildings. The Long or Great Room in Well Walk, shown in the print after Chatselaine, having been converted into a chapel in 1725, and since used as a Volunteers' drill-hall, survived until 1882 when a house called "Well Side" was built in its place, the gardens, however, and the trees are in a great measure preserved. Alterations in Well-walk and Well-road, and the making of sewers have cut off the flow of water of the old chalybeate spring on the east side of the walk; a granite drinking-fountain erected on the west side yields a very sparse supply, and though the spring has been lately found in the near vicinity, the highly ferruginous water contains organic matter.

Practical Surveying. A Text-book for Students Preparing for Examinations or for Survey Work in the Colonies. By GEORGE WILLIAM USILL, Assoc.M.Inst.C.E. Eighth Edition, thoroughly revised and enlarged by ALEXANDER BEAZELEY, M.Inst.C.E. London: Crosby Lockwood & Son. 1904.

Most students of surveying are familiar with the admirable treatise written by the late Mr. Usill, whose experience in the preparation of candidates for examinations enabled him to form a just conception of the most appropriate treatment to be followed in a text-book. In the present revised edition Mr. Beazeley has taken the opportunity of adding some new matter, which has the effect of bringing the work thoroughly up to date, and of correcting sundry topographical and kindred errors to be found in previous editions. While preserving the original text as far as possible, the editor has found it necessary to modify and amplify some portions and to re-write others. Speaking generally, it may be said that the task has been performed judiciously, and that no evidence is given of a desire to make alterations without adequate reason. As the manual in its previous form has already been reviewed in our columns, it is unnecessary to dwell at length upon the various departments of surveying work that are discussed in its pages. After preliminary chapters relating to the instruments and mathematical knowledge forming the equipment of the surveyor, the author discusses chain surveying, theodolite surveying, traversing, town surveying, levelling, contouring, and setting out curves, concluding with chapters on office work and land quantities. All these sections of the general subject are dealt with in a manner that leaves little to be desired and which we believe will be fully appreciated by students. It should be remarked, however, that the claim made upon the title page, relative to students preparing for survey work in the colonies, is scarcely justified by the body of the work, which is essentially a text-book of surveying as practised in the United Kingdom.

No attempt is made to deal with engineering field work as practised in India and similar

countries, or with the special knowledge that should be possessed by aspirants for work in the colonies. Mr. Beazeley has certainly made an attempt to justify reference to the colonies by the insertion of a chapter containing the latest regulations under which licences for practice are issued in the chief British possessions. This is a most useful feature, and one that is not to be found in other text-books on surveying; but the fact remains that candidates must look elsewhere for teaching in the higher and special branches of surveying generally required in new countries. These remarks are merely in criticism of a claim which is not fully substantiated, and must not be taken as reflecting in any way upon the general usefulness of a book of which we entertain the most favourable opinion.

Smoke Prevention and Fuel Economy By

WM. H. BOOTH and JOHN B. C. KEESBAW.

London: Archibald Constable and Co. 1904.

THIS book is principally devoted to a discussion of the methods by which boilers can be economically heated without the concomitant evil of the emission of smoke from the boiler furnaces. Only very brief reference is made to the domestic smoke problem, but we agree with the authors that its solution lies in the direction of gas firing. The book is divided into four chapters and three appendices. Chapter I. discusses in a very elementary style the "Chemistry of the Combustion Process"; Chapter II., the improved methods of burning fuels; and Chapter IV., the examination of waste gases and control of the combustion process. This last chapter is, we think, the most useful portion of the book.

In the opinion of the authors the present smoke of London is due to the use of water-tube boilers more than to anything else.

"Before the advent of the water-tube boiler the question of smoke was gradually being brought into line. Water-tube boilers had been tried and found wanting in the matter of smoke. In the United States, however, where the making of boilers is very far behind the practice of this country (and it was still further behind a quarter of a century ago), the water-tube boiler was persevered with, and the well-known type of to-day was evolved. . . . But the water-tube boiler in America was the product of the hard coal region. It was made to burn Pennsylvania anthracite, which is absolutely smokeless. This boiler, which could not make smoke when fired with Pennsylvania anthracite, was sent over to Great Britain to use bituminous coal, and, being set exactly as in America the results have been hopelessly bad."

The smoke remedy for water-tube boilers recommended by the authors consists in the use of external furnaces or generators, and firebrick linings for the furnace and boiler settings. The boiler is, in fact, located in an oven heated by the combustion of producer gas. It is admitted that the initial cost of an installation of this description would be greater than the older forms, but the authors contend that the argument that steam cannot be economically raised unless the boiler is exposed to the direct radiation of the furnace is fallacious. There is little doubt that smoke emission would be rendered unnecessary if the boilers were heated in the manner recommended, but we fear that the cost would be prohibitive except in the case of very large installations.

We entirely agree that the time has come when more stringent supervision as to smoke emission should be demanded. A large number of manufacturers have already replaced steam engines with gas engines, with the result that where such conversion has taken place smoke emission has ceased and pecuniary advantage accrued. Many of the manufacturers who continue to pollute the atmosphere with smoke cannot justly claim that their machinery cannot be economically operated without the use of steam. We are, of course, aware that laws relating to the smoke nuisance already exist, but we are also aware that even in the heart of London scores of factory chimneys continue to belch forth smoke of appalling blackness.

The authors rightly say that "smoke ought to be attacked, not only because it brings dirt and depression in its train, but because its emission is accompanied by that of gases which are directly detrimental to the health of all living things." We welcome the attempt of the authors to demonstrate how even water-tube boilers may be economically fired without emission of smoke from the furnaces.

New Streets: Laying Out and Making Up. By A. TAYLOR ALLEN, C.E. London: The Sanitary Publishing Co., Ltd. 1904.

This is a useful little compilation giving clear and brief information on the subject, both in

regard to the law and to the technical part of the matter. At the end there are sections and drawings, and a full index. But why is the date of publication omitted from the title page? This information a year or two hence may be material.

Aids to the Study of Sanitary Law. By HARRY CHURCHLEY, M.A., M.D., D.P.A. London: Baillière, Tindal, & Cox. 1904.

THIS is simply a handbook giving in untechnical and clear language the substance of the various existing statutes regulating the public health. It is a capital book, with a sufficient index, and should be useful to medical officers, who have to know the outlines of public health law.

The "Mechanical World" Pocket Diary and Year Book for 1905. Manchester: Mechanical World Offices.

The chief feature of novelty in the present edition of this little book is the addition of tables of trigonometrical ratios, of the squares, cubes, and fourth powers of fractions, and of powers, roots, and reciprocals of factors in common request. A table of sheet and hoop iron gauges is now included, and various minor revisions have been made.

BOOKS RECEIVED.

CASSELL'S CYCLOPEDIA OF MECHANICS. Edited by Paul N. Hasluck. Fourth series. (Cassell & Co.)

LIVES OF THE ENGINEERS. Smeaton and Rennie. By Samuel Smiles. Popular edition. (John Murray. 3s. 6d.)

PROCEEDINGS OF THE INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS, 1903-1904. Edited by Thomas Cole, A.M.Inst.C.E. (E. & F.N. Spon.)

OLD HOUSES IN EDINBURGH. Drawn by Bruce J. Yorne. Part I. (S. Bagster & Sons. 1s.)

YORK: THE STORY OF ITS WALLS AND CASTLES. By T. P. Cooper. (Elliot Stock. 10s. 6d.)

Correspondence.

SPRING-GARDENS, CHARING CROSS, AND WHITEHALL.

SIR.—As a student of London topography, I quite appreciate the time and labour involved by, and the excellence of, your New Year's article. One is obliged for the writer's courteous offer of Mr. Cates's survey, especially when it is remembered that that gentleman was the professional successor of Chawner & Pennington. My point, however, is established in another way. The London Post Office Directory for 1886 shows that Viscount Gage inhabited No. 4, Whitehall-yard; and section 19 of the Horse Guards Avenue Act, 1883, provided that, before No. 5 and 6, Whitehall-yard, were demolished, No. 4 should be fitted up for a Government office, such as it is to-day. The Bankruptcy Department occupied Nos. 5 and 6 from 1886, and passed, in 1889, into No. 4, when the alterations were completed.

As to the identification of the site of the Dowager Duchess of Portland's house by means of the present houses in Whitehall-gardens, my statement that Sir Robert Peel's house covered the spot is based on a return made by the Commissioners of Woods, Forests, and Land Revenues. Dr. Sheppard, to whose book I am referred, states that the Duchess sub-divided her house, and the leases had become intermingled. He quotes the original lease to William, Earl of Portland, but omits the length of land conveyed. This lease is dated April 6, 1696, and conveys a frontage of 124 ft. 5 in. for forty-two years at 6s. 8d. a year, according to the enrolment of leases in the Land Revenue Records. There are, as Dr. Sheppard states, subsequent leases to the succeeding Dukes and to the Duchess; but it is evident, from Bromley's view, that Portland House did not stand on the extreme north of the land leased, whilst No. 6, Whitehall-gardens, has only a frontage of some 40 ft., and is on the extreme north of the ground. I hazarded No. 5 as originally Lord Sheffield's house, as he was living in the Privy Gardens, as they were then called, in 1795. In Mrs. Adeane's "Early Married Life of Maria Josepha Lady Stanley (of Alderley)," under date October 2, 1803, Lady Maria writes:—"We are told our house in Privy Gardens is nearly completed, and that it looks well. When my Lord Sheffield (Gibson's friend did not die until 1821) sees how different whitewash, paint, and paper make it appear, I think he will be

very sorry he parted with it, for the situation must suit him better than Portland-place. The yearly rent is £200, and the taxes moderate, from the place being exchequer property on account of its being part of the old palace ground." It is difficult to say whether this house stood north or south of Sir Robert Peel's site; prior to 1847 these houses were not numbered in the Post Office Directory, but the residents were alphabetically arranged. The task of identification is, therefore, not an easy one, and the researches of your article writer are worthy of much praise.

ROBERT J. LISTER.

SCHOOL, PORTH.—The Higher Elementary School, which has been erected at Porth, has just been opened. The school has cost £10,375. The contractor was Mr. Willis, Pentre, and the architect Mr. J. Rees, Pentre. There is accommodation for 240 children in the seven classrooms.

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE-STEEL.—IV.

A SIXTEEN-STORY OFFICE BUILDING (continued).

CONTINUING the description—commenced in our last issue—of the Ingalls Building, we will next consider the construction of the columns.

Fig. 20 includes a part vertical section of a typical column with girder connexions, and a cross-section of the same column.

Each column is provided with four, six, or eight plain round steel bars, ranging from 2 in. to 3½ in. diameter, having faced ends held together by sleeves of wrought-iron pipe filled with cement grout. In the basement these bars take a bearing, as already stated, on the projecting faced bosses of the cast-iron

bases. In the first three stories the column bars were cut to length, so that they extended a few inches above the floors, and the next lengths were added as the work proceeded. In the stories above, the bars were of sufficient length to extend through two floors, the jointing in each case being performed with pipe sleeves and cement grout.

The essential purpose of the round bars is to resist direct compression, but in addition each column has from four to ten twisted bars of square cross-section to resist tension due to flexure arising from wind pressure. The column in Fig. 20 has ten twisted bars, placed 1 in. from the surface of the concrete, these bars being joined together at the middle of each story with splices formed of ½-in. twisted bars wrapped with wire.

In addition to vertical reinforcement, the round compressive bars are connected by three sets of transverse ties in the height of each

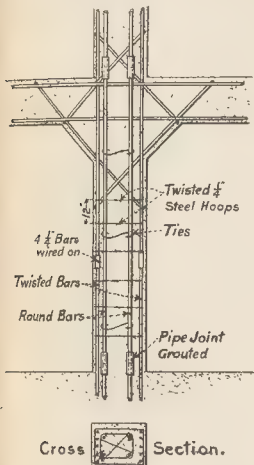
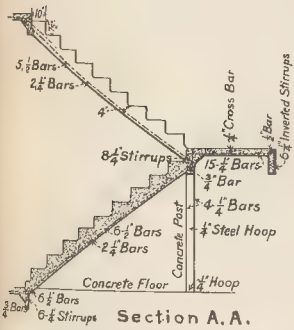


FIG. 20.



Section A.A.

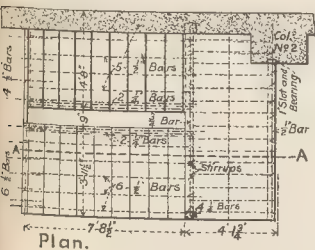


FIG. 26.

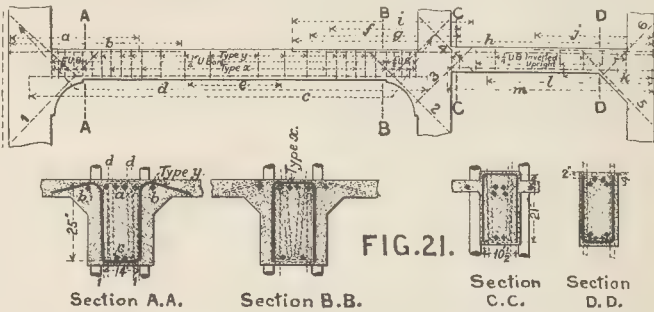


FIG. 21.

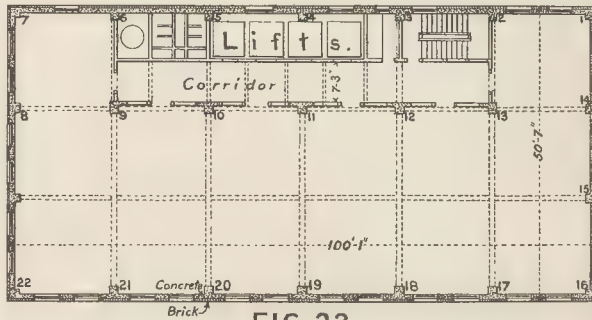


FIG. 22.

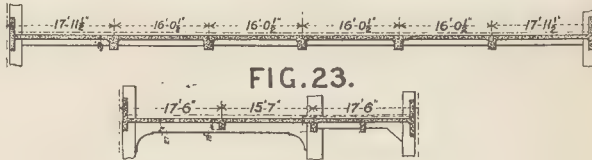


FIG. 23.

FIG. 24.

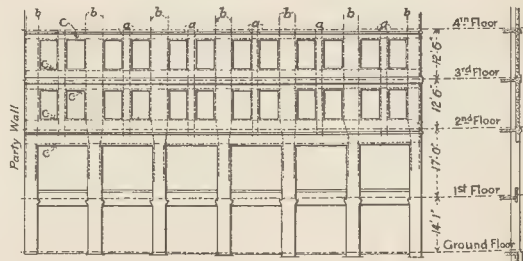


FIG. 25.

Illustrations to Student's Column.

story, to prevent any tendency to outward buckling, and to add to the shearing strength of the columns. The twisted wind bars are also tied transversely by hoops of $\frac{1}{2}$ in. twisted steel, as shown in Fig. 20. These hoops are spaced at intervals of about 12 in., centre to centre, and secured by wire to the verticals, the ends of each hoop being bound with wire.

The dimensions of the cross-sections of the various columns were settled in accordance with architectural requirements, and with the loads to be carried. The resistance of the cross-section so determined was calculated in the first place for concrete alone, and the deficiency of strength was then made good by the addition of round steel bars. Thus the practice followed was in agreement with the principle stated in a previous article,* that "the only advantage of longitudinal reinforcement in columns consists in adding the resistance of the steel to the resistance of the concrete."

Allowance was also made for strain due to shrinking of the concrete (which, as we showed in the same article, may cause severe initial stress in the steel reinforcement) and the cross-sectional area of the materials was adjusted so that the stresses might be proportional to the co-efficients of elasticity of the concrete and the steel.

On reference to Fig. 20 it will be seen that very strong girder connexions are formed by the diagonal bracing bars and the concrete brackets on the column at the end of the girders.

Corresponding with the spacing of the columns, the main girder spans are from 16 ft. to 33 ft., the clear spans, of course, being slightly less. In the ground floor, the main girders measure 20 in. wide by 36 in. deep; in the first floor, 20 in. wide by 34 in. deep; and in the floors above 20 in. wide by 27 in. deep. The depths here mentioned include the thickness of the floor slabs, which are 7 in. thick in the ground floor, and 5 in. thick in all floors above.

Fig. 21 gives details of typical girder construction, the most noticeable feature being the apparent preponderance of reinforcement in the upper part of each beam. On closer examination, however, it will be seen that the upper bars only extend for a certain distance from each support. The reason for this is that owing to the ample strength and rigidity of the column connexions, the girders were justifiably considered as continuous beams. Under these circumstances the upper part of the cross-section is in tension up to the point of contrary flexure, a fact accounting for the arrangement of the reinforcement illustrated in Fig. 21.

In addition to the horizontal reinforcement shown, all the girders are amply provided with vertical reinforcement, consisting of U-shaped stirrups of twisted steel bars for resisting shear, every alternate stirrup being inverted. These stirrups are placed at different distances apart in accordance with the progressive diminution of shearing stress towards the middle of the girder. The ends of the horizontal bars are continuous through the columns, and pass between the vertical compression bars.

As pointed out above, the connexions between the beams and the columns are strengthened by diagonal bracing, extending from the top of the girder downward, and from the bottom upward, the lower diagonals being protected by concrete brackets, which not only help to fix the ends of the girders, but also serve as additional wind bracing (see Fig. 20).

The following table gives particulars of the horizontal and diagonal reinforcement in the girders represented in Fig. 21, the letters in this table corresponding with those in the sections.

PARTICULARS OF REINFORCEMENT IN FIG. 21.
HORIZONTAL REINFORCEMENT IN GIRDERS.

a 4 $\frac{1}{2}$ in. bars 10 ft. long		
b	2 1	" 13 "
c	2 1	" 34 "
d	2 1	" 34 "
e	2 $\frac{1}{2}$	" 7 "
f	2 1	" 10 "
g	2 1	" 11 $\frac{1}{2}$ "
h	2 1	" 14 "
i	2 1	" 14 "
j	2 1	" 11 $\frac{1}{2}$ "
k	2 1	" 17 "
l	2 1	" 17 "
m	2 1	" 16 "

DIAGONAL REINFORCEMENT IN COLUMN CONNEXIONS.

1 2 1 in. bars 9 ft. long		
1	2 1	" 8 $\frac{1}{2}$ "
2	2 1	" 8 $\frac{1}{2}$ "
3	2 1	" 8 $\frac{1}{2}$ "
4	2 1	" 8 $\frac{1}{2}$ "
5	2 1	" 8 $\frac{1}{2}$ "
6	2 1	" 8 $\frac{1}{2}$ "

* The Builder, Vol. LXXXV., p. 612.

STIRRUPS IN GIRDERS AT LEFT HAND.

a	4 $\frac{1}{2}$ in. U-bars 5 ft. 4 in. long
b	10 "
c	14 $\frac{1}{2}$ "

STIRRUPS IN GIRDER AT RIGHT HAND.

10 $\frac{1}{2}$ in. U-bars 4 ft. 4 in. long.

As a general rule, the under parts of girders are not covered, but in the corridors of the building a ceiling is formed 6 in. below the under side, the space between the ceilings and the floor slabs being used as air ducts in connexion with the system of ventilation.

The floor slabs are reinforced by two series of twisted bars laid longitudinally and transversely, the bars being simply held in position by the surrounding concrete. Each of the larger floor panels, measuring 32 ft. by 16 ft., is sub-divided into two panels, each 16 ft. square, by an intermediate girder (see Fig. 22). In calculating the proportions of the reinforcement, the panels were treated as slabs, supported along each of the four sides.

Fig. 22 is a typical plan, which shows the general arrangement of the upper floors; and Fig. 23 is a floor section between the columns from end to end of the building. The widths of the main girders represented in this section are as follows:—

On floors 2 to 4	20 in.
" 5 to 9	18 in.
" 10 and 11	17 in.
" 12 to attic 16 in.	

Fig. 24 is a section between the columns across the building. In this drawing the intermediate girder will be seen as well as the dimensions of the girders illustrated in Fig. 21.

All the floor slabs are monolithic with the walls, columns, and girders, the calculated live loads being 200 lb. per sq. ft. for the ground floor, 80 lb. per sq. ft. for the first floor, and 60 lb. per sq. ft. for the remainder of the floors. As indicated in Fig. 12 ante, the roof is flat, and its construction generally resembles that of the floors. The upper surface of the concrete slab is covered with thick sheets of roofing felt jointed with tar, and over this is a $\frac{1}{2}$ -in. layer of concrete, faced with neat cement finished smooth and divided into squares by V-shaped grooves filled with asphalt, the same as in the case of the street foot pavement.

Irrespective of the marble and brick facing, the outer walls of the building are only 8 in. thick, and the party walls are not more than 4 in. thick. The concrete of the walls is reinforced throughout with vertical and horizontal bars of twisted steel. Fig. 25 includes an elevation on the Vine-street frontage, from ground level to the fourth floor, and a section of the outer wall. The vertical bars (a) extending through two floors are $\frac{1}{2}$ in. square and 27 ft. long, the ends being jointed close to the floor line. These bars are about 2 in. away from the window openings. The vertical bars (b) form the column wind reinforcement, which has already been described, the joints being made half-way up each story. The horizontal reinforcement (c) consists of pairs of $\frac{1}{2}$ -in. twisted steel bars set side by side near each face of the wall, and about $\frac{1}{2}$ in. above the top and bottom edges of the window openings. The bars are 27 ft. long, and their ends are overlapped 21 in. at all joints, the overlapped ends being bound with wire when the joints come between the columns.

Fig. 26 is a plan and section of a stairway, the position of which is indicated in Fig. 22. As all essential details are clearly shown in the drawings no comment is necessary.

Adhesion between the concrete and the steel was taken at 500 lb. per sq. in., and experiment demonstrated that $\frac{1}{2}$ -in. twisted bars embedded in concrete blocks, measuring 8 in. by 8 in. by 12 in. long, could not be pulled out until the force attained 19,000 lb. This high result was evidently due to the mechanical bond afforded by the twisted surface of the steel bar, added to the natural adhesion between the two materials (see Article VI. of our previous series*). It is claimed by the patentees of the twisted bars that twisting has the effect of increasing their tensile resistance by about 33 per cent. as compared with untwisted bars, and of raising their elastic limit almost to the ultimate resistance of plain bars.

In the building now under consideration, the bars were twisted on the site by a specially designed machine having three different heads revolving at different speeds to suit the sizes of the bars to be treated. The time required for twisting averaged about one minute, the

* The Builder, Vol. LXXXV., p. 165.

bars being twisted so that the angle formed by the edge was tangential to an angle of about 20 deg. It is stated that in the case of a $\frac{1}{2}$ -in. square bar this effect can be attained by one complete turn in each foot of length.

The concrete used throughout the structure consisted of 1 part of Portland cement, 2 parts of clean sharp sand, and 4 parts of pebbles, or crushed limestone. A wet mixture was generally used, the proportion of water being varied to suit the different members for which it was required. The concrete was thoroughly stirred and worked in the moulds by means of steel bars, or timber poles, so as to insure the escape of air, and the filling of all spaces between the several bars of the reinforcement. Especial care was taken in the case of narrow girders to fill the moulds slowly, and to stir the concrete at the same time to prevent the formation of voids. In addition to stirring of the concrete, the moulds were all struck on the outside with mallets to insure the settlement of the concrete, and to guard against the appearance of voids on the exterior faces of the work.

In the next article a brief account will be given of the concrete moulds and plant employed by the building contractors.

OBITUARY.

MR. BLASHILL.—We greatly regret to announce the death, on Friday, January 20, at his house, 29, Tavistock-square, London, after a short illness, of Mr. Thomas Blashill, in his 75th year. Mr. Blashill, the son of Mr. Henry Blashill, of Sutton-on-Hull, received his education at Hull, Scarborough, and University College, London. In 1857 he was elected a member of the Architectural Association, and was President in 1862-3. In 1866 he was elected an Associate of the Institution of Civil Engineers, and a Fellow of the Royal Institute of British Architects, of which he served as member of Council, and for the sessions of 1900-1, 1903-4, and 1904-5, was elected a member of the Science Standing Committee. He was a Fellow of the Surveyors' Institution; Vice-President of the British Archaeological Association in 1901, and honorary treasurer of that society during some while until his resignation of that office in November, 1898, and a member of the Council of the London Topographical Society, whose annual meeting he attended but four or five weeks ago. In February, 1887, Mr. Blashill, defeating A. W. Peabes by one vote, was elected to succeed Sir Fulham in the office of Superintendent Architect to the late Metropolitan Board of Works. He held that appointment under their successors, the London County Council, until his retirement, on a pension, on March 28, 1899, the term of his tenure of office having been extended in the interests of the public service on three occasions within the interval. Notwithstanding his attainments of the age of 65 years in October, 1885, in the period 1887-1899 Mr. Blashill prepared the plans and designs of a large number of buildings for the Board of Works and the London County Council, amongst them being the following:—The enlargement, with a gallery for the public and a rearrangement of the floor space, of the boardroom at Spring-gardens for the London County Council, 1888; and an extension of the reporters' gallery, 1894; the Weights and Measures Testing Offices and the Gas-Meter Testing Station, Rosebery-avenue, Clerkenwell, 1891-3; the site of the Horse-monger-lane Gaol, Newington; the lodge at North Woolwich Gardens, 1891; the fire brigade stations at North Woolwich, Dulwich, Cherry Garden-street, Rotherhithe, Simpson-street, Battersea, Carmichael-street, Whitefriars, Lewisham (old Lewisham House site), Clerkenwell, Tottenham, Cripplewell, Without, Hampstead (enlargement), Fulham-road, near Parson's Green, and South Lambeth, a conversion of Arlington House; the Coroner's Courts at Bethnal Green, 1896, and Paddington, 1898; and the Weights and Measures Testing Offices at Harrow-road and in Calvert-street, Shoreditch. He was the architect of twenty-one blocks of working-class dwellings, built on the Boundary-street, Shoreditch, site, opened by the King (then Prince of Wales) on March 3, 1900; of similar blocks built on the site of Millbank Prison, some other of his designs being carried out there by his successor, Mr. Riley; cottages on Plot 11, east of the Brook-street, Limehouse, area (1899); and, in conjunction with Sir Alexander Binnie, late Chief Engineer, London County Council, the houses at the entrances into the Blackwall tunnel, opened on May 22, 1897. On January 28, 1887, we illustrated his plans and designs of Ingram House, Fenchurch-street; in 1875-6

cesses. Blashill & Haywood were the architects, after the Gothic style, of Christ Church, Burn Hill, Beckenham. In November, 1903, he was appointed, with Mr. W. D. Ross, and Mr. H. D. Searles-Wood, as a representative member of the Institute upon a joint Committee of the Plumbers' Company, a larger Water Authorities of the country, and the Institute, to inquire into the questions of waste of water, the technical education and qualification of plumbers, and the efficiency of plumbing work in general. In May, 1902, Mr. Blashill was deputed, together with Mr. John Ater, to represent the Institute at the annual congress of the Sanitary Institute, held in Manchester in September of that year. In October, 1901, he was an Examiner in Building Construction for the Science and Art Department, Royal College of Art, and he was appointed chairman of a conference upon the Standardization of Bricks, held jointly by the Institute, the Institution of Civil Engineers, and the Institute of Clay-workers, held at the International Building Trades Exhibition in April, 1901. At the annual general meeting of the Institute, on May 5, 1902, Mr. Blashill was elected on to the Statutory Board of examiners in pursuance of the London Building Act of 1894, and other enactments in that behalf. Of Mr. Blashill's other addresses, papers, and similar publications, he should include his papers on "The Present Condition of the Building Industry," read to the Surveyors' Institution, and reported in our columns of March 2 and 9, 1901; "Unhealthy areas and the Housing of the Working classes," read at the Sanitary Institute Conference, Southampton (October 2, 1901); "Lessons from Fire and Panic," read to the meeting in Manchester of the Surveyors' Institution, and reported in our number of April 23, 1898; "Sanitary Construction, Warming, and Ventilation," a lecture delivered at Carpenters' Hall, London (November 4, 1899, reported in our issue of 23); "Relation to Fire Prevention," read at a meeting of the Institute (December 23, 1899, reported); "Housing of the Working Classes," read to a meeting of the Sanitary Institute (April 7, 1900, reported); "Working-class dwellings in blocks," read to the Architectural Association (February 17, 1900, reported, in plans); "The State of the London streets," read to the Sanitary Institute (February 23, 1901, reported); and "London street traffic," read to members of the Surveyors' Institution (April 30, 1904, reported). Mr. Blashill read a paper upon Tintern Abbey to the Bryn and Gloucestershire Archaeological Society several years ago, and is the author of "Sutton-in-Holderness, Manor, the Berewic, and the Village community," a work descriptive of the manor-side before the making of enclosures in the XVIIIth century, of which he brought a new edition in August, 1900, and of an essay upon "Oak or Chestnut in Old Timber," read to the Institute, and reported in *The Builder* of April 20, 1878.

GENERAL BUILDING NEWS.

METHODIST CHURCH, MALIN BRIDGE, SHEFF.—A new church has been erected at Malin Bridge by the Methodist New Connexion. The length of the building is 60 ft., the width over 35 ft.—across the transept 32 ft. There is accommodation for adults, or a mixed congregation of 450 persons. On the same floor are an organ, and vestries for minister and choir; an advantage has been taken of the steep slope of the ground to place a church parlour at the front end of the church, with a cloakroom, etc., adjoining. The walls are built of local stone, with rock face, and large dressings to windows and doorways; the roof, which is a tiled one, is supported on stained timber, with arched ribs of pitch-pine is the material used for the partially open ceiling, and the wood is used in all the joinery, except regard to the rostrum, which is of walnut. Heating, on the low-pressure hot-water system, has been carried out by Messrs. Light Brothers, of Sheffield. The architect is Messrs. John Wills & Sons, Derby; and the builders, Messrs. Chadwick & Co., of Rothorham.

RESTORATION OF ELVASTON CHURCH, ELVASTON, LEIC.—St. Bartholomew's Church, Elvaston, an ancient fabric, has been closed for about five months for restoration purposes, and it reopened recently by the Bishop of South-Down. The present restoration comprises extensive repairs and improvements, and an extension of the chancel. New vestries have been built. The restoration of the oak screen has been effected. The floor has been lengthened by 11 ft., and a

new sanctuary arch has been built where the former east end stood. The new sanctuary has no east window, but there is a reredos of carved white clunch filling the whole end. This is carved with subjects and figures, and is lighted by two traceried windows of three lights each, in the north and south walls of the sanctuary respectively. The glass which was at the east end, and which was much cracked, has been reproduced, and this is placed in the new north window of the sanctuary. The pavements of the sanctuary and chancel are of black-and-white marble. The floor of the nave under the seats is laid with wood blocks, and the passage with slate and white stone. In the nave the plaster has been removed from the walls, and stone ashlar work was found, which has been restored. So also with the piers and arches; the plaster was removed from them, and the stone is now seen, but the tomb and the arch above it on the north side of the nave have not been altered. The windows have been reglazed, and their stonework made good where injured or decayed. The chancel is fitted with oak stalls and fronts, on what was the old arrangement, and the nave and aisle are furnished with open seats of oak. The ends of the seats are carved with lines-fold patterns. A new screen has been placed on the screen. A carved oak pulpit has been placed in what was the original position; it is surmounted by a canopy. One feature of the work has been the decorative painting of the roofs and parts of the walls. The sanctuary roof is enriched with gold and blue. The chancel roof is coloured red, treated decoratively, and has gilding on the crested carvings and bosses. The nave roof has been made uniform in tint, and deficient parts have been made good. Here, too, gilding has been used. Upon the west face of the chancel angels have been painted on either side of representation of Christ in glory. The west side of the chancel arch is covered with scrolls. The work has been carried out, from the designs of Mr. G. F. Bodley, R.A., by Mr. Kett, of Cambridge. The decorative painting was by Mr. Jackson, of Ealing, under the architect's direction.

BAPTIST CHURCH, WALTON.—A new Baptist church has been opened in Winchester-road, Walton. The building, which is of red and white brickwork, with open-timbered slated roof, seats about 160 people in pews and chairs. The interior walls are cemented, with matchboard dado, and the heating and lighting is by gas. Mr. John Lee was the contractor for the work, the architect being Mr. A. Imber.

CHURCH SCHOOLS, HODTHORPE.—The new Church school, which has been erected at Hodthorpe, near Whitwell, has just been opened. The new building, which will seat 236 children (mixed and infants), is built of brick, with stone facings, and consists of a schoolroom, and other minor apartments. The architects were Messrs. Gibbs & Flockton, Sheffield, and the builders, Messrs. H. Vickers & Son, Nottingham. The contract price was 2,000l.

REBUILDING IN WEST LONDON.—Thomas's Hotel, Nos. 25-6, on the north side of Berkeley-square, has been pulled down for the erection, after Mr. F. F. Vorty's plans and designs, of new buildings which will abut upon Jones-street and Bourdon-street at the side and rear, respectively. Extensive rebuilding is in progress on the east side of St. James's-street, where two sites have already been cleared—those of Nos. 23-7, between Ryder-street and Boodle's Club, for houses with shops, to be built by Messrs. Howard & Co., and Messrs. J. Grover & Son, contractors, and of Nos. 36 and 35a, with No. 64, Jermyn-street, between Jermyn-street and White's Club, for similar premises by Messrs. G. H. & A. Bywaters & Sons, after plans and designs prepared by Mr. W. Woodward for Mr. L. Thomas. Mr. Leslie W. Green is appointed architect of the premises that will take the place of Nos. 29-30, and of three houses in Bury-street, at the rear. In Albemarle-street the site lately occupied by St. George's Chapel is taken by Viola, Ltd., for a building planned and designed by Mr. Charles G. Miller.

THE BUILDING TRADE AT DARLINGTON.—Dulness seems to have been the chief feature in the building trade of the country during the year, and Darlington, despite the satisfactory progress made in certain of its industries, has not escaped the prevailing depression. According to Mr. Winter, the Borough Surveyor, there has been a slight decline in the number of houses erected, and the plans passed for new buildings, compared with the preceding year. The number of plans passed was 191, a decrease of twenty comparing with 1903, whilst the houses erected last year numbered 348, as against 355. Over

1,500 houses have been erected in Darlington since 1900, many new residences having been built in the vicinity of Hopetown, the Park-lane district, the Eastbourne Park, and the north end of the town. Whilst there is a good demand for the smaller class of dwellings let to tenants clear of rates, many better-class houses, owing to overbuilding and increasing local rates are unoccupied. Recently plans were passed for fifty houses on the Greenbank estate, and more developments are expected. This will cause building to be brisk in that part of Darlington, but in other directions there seems to be a slackening down of speculative enterprise.—*Darlington Star*.

PUBLIC LIBRARY, CUBITT TOWN, LONDON.—On the 14th inst. a public library, which has been erected in Strattondale-street, Cubitt Town, Poplar, at the approximate cost of 5,000l., was opened. The library, which has been built from the designs of Mr. C. Harrold Barton, of Bedford-row, W.C., is in the classic style, the material employed in the front block being Bath stone from the Monk's Park quarries. The floors of the public rooms are laid with pitch-pine blocks on concrete, and the floors of the vestibule, porch, etc., are covered with terrazzo mosaic. The library is capable of accommodating 25,000 volumes.

SUNDERLAND LAW COURTS.—The foundation-stone of new police buildings, which will be completed in about a couple of years, were laid on the 18th inst. at Sunderland. The scheme provides for a Quarter Sessions Court, an ordinary police court, and a fire brigade station. The two police courts are on the first floor of the main building; the fire station being a separate block. The Corporation offered premiums for competitive plans, and the first award, for a Renaissance building, was secured by Messrs. W. & T. R. Milburn, with whom were associated Messrs. Wills & Anderson, of London. The contractor is Mr. W. White, of Sunderland. The site of the new buildings is a central one, between the Corporation Baths in the High-street and the Avenue Theatre. The total cost of the scheme will be something like 40,000l.

NEW DISPENSARY AT THE WESTERN INFIRMARY, GLASGOW.—The new buildings for out-patients at the Glasgow Western Infirmary were opened on the 18th inst. They are situated to the west of the main infirmary block, and are entirely isolated from it. The dispensary forms part of a scheme for the extension of the infirmary to the west, and it will be joined to the main building by a corridor. Entering off this corridor is the electrical department, placed for both infirmary and out-patient departments. The entrance to the dispensary proper is from Church-street, a side street running north from Dumbarton-road, in which is situated the main entrance to the infirmary grounds. Entrance and exit gates are provided leading to courtyards separating the entrance and exit doorways. Patients enter by the east doorway, and, under the control of the porter, are directed, on their first visit, into the waiting-room for new patients, where all inquiries are made, the old patients passing into the general waiting hall. The new patients' waiting-room is 25 ft. by 16 ft., and is in communication with a diagnosis room for the examination and classification of cases. The diagnosis room is lighted by a vertical and roof light on the north side, and adjoining it is a room for the isolation of any suspicious or infectious cases. This room has a separate door to an ambulance court. The general waiting hall, 86 ft. by 31 ft., is seated for over 400 persons. The patients will be classified into groups for convenience of distribution into the various surgical and medical consulting-rooms; lavatory accommodation is provided in open courts adjoining the waiting hall. From the waiting hall the communication corridor leads eastward to the main operating theatre, 30 ft. by 29 ft., with gallery accommodation for sixty students. This room is lighted by vertical and roof light from the north, and has attached to it a sterilising and recovery-room, the latter divided for male and female patients. Above this there is a nurses' room for the preparation and storing of surgical dressings, etc. Immediately to the east of the waiting hall is the surgical dressing-room fitted with arm and foot sinks, and divided by enamelled slate partitions into separate compartments. Small lobbies lead off the waiting hall to the medical and surgical consulting-rooms, with their necessary dressing-rooms. At the west end the communication corridor leads into the ear, nose, and throat rooms, consisting of a consulting-room, 30 ft. by 24 ft., having gallery accommodation for fifty students, and communicating by a sliding door with a darkroom, 37 ft. by 24 ft., fitted with eighteen stalls for the examination of patients by artificial light. The dispensary hall, 30 ft. by 19 ft., is seated

for seventy persons, and has two service openings, with sliding doors from the dispensing-room, and adjoins the exit vestibule near the street. The dispensing-room is 30 ft. by 20 ft. Adjoining this room is the laboratory. The heating is done by low-pressure hot water. The ventilation is arranged on the extract principle, four electric fans being used for removing the vitiated air. The building has been constructed from plans prepared by Mr. John James Burnet, A.R.S.A., and Mr. Thomas Young, engineer, is responsible for the lighting and heating.

PROPOSED PUBLIC BUILDINGS, LEEDS.—An inquiry was held at the Leeds Town Hall, on the 25th inst., by Lieut.-Colonel A. C. Smith, R.E., an Inspector of the Local Government Board, into the application of the City Council for sanction to borrow 5,000l. for the erection of offices and other buildings at their new Highways depot in Kirkstall-road. The new depot will comprise offices, workshops, and a messroom. Mr. Bruce, the architect, submitted and explained the plans to the inspector, and the inquiry closed.

SANITARY AND ENGINEERING NEWS.

SEWAGE IN THE BRENT DISTRICT.—The Engineer to the Willenden District Council (Mr. O. Claude Robson) draws attention to this subject in his twenty-ninth annual report. He says:—"Writing in 1894 with regard to the treatment of sewage in the Brent district, I then found it my duty to point out the necessity, owing to the great extension of the district, for some additional works to be undertaken in order to maintain a sufficiently good standard of purity for the effluent discharged into the Brent river. In 1895 instructions were given for the preparation of plans for this purpose, the result being the expenditure of a sum of 57,544l. for the purchase of 52 acres of land, and the enlargement of the works incidental to treatment. Writing a decade later, I am constrained to point out the necessity for again carefully and speedily considering this much discussed question, the population having increased from 27,000 in 1894 to 60,000 in 1904, the latter being the exact figure submitted to the Local Government Board as the ultimate possible population for which the extended works of 1894 would be available. This great increase of double the population in less than ten years is perhaps unique in any town in this country, and when, in addition to this, it is considered how utterly unsuitable both the land and river are for treatment, together with the separate financial responsibilities of this section of the district, the difficulties of the situation are summed up in a nutshell. The disadvantages under which the Brent district has suffered have been dealt with in various reports from myself upon more than one occasion, and it would now be useless to reiterate them, the main point for earnest consideration at the present moment being the most desirable method to adopt for the extension or alteration of the outfall works, in order to provide for the existing and future necessities of the district. To continue the present system of treatment by precipitation tanks, filters, and land, is altogether out of the question, no additional or better means for the final treatment being available. Three methods present themselves as means for solving the Brent difficulty, as stated in my previous reports, viz.:-

- (1) Biological treatment at the site of the present works.
- (2) A Brent valley scheme embracing the whole of the towns upon the river.
- (3) The delivery of the sewage into the London sewers by agreement with the London County Council.

Of these three proposals the latter is, to my mind, the most desirable to adopt, if satisfactory terms can be arranged with the London authorities, and, with this in view, negotiations should be entered into at an early date to ascertain the possibilities of the proposition. Failing success in this direction, the valley scheme would doubtless be preferable to the continuation of the process of treatment upon the site of the present works, as, with the rapid development of the district, the works will ere long be entirely surrounded by houses of a small class character, forming practically a portion of Greater London, where it might be most undesirable for sewage works of any description to be situated. Looking, therefore, to a continuance of the abnormal growth of the district, rendered more than ever likely by recent schemes of tramway and railway promotions in the neighbourhood, it appears to me that the main endeavour of the Council should be, in the first place, to remove the works from their present locality, either by discharging into the sewers of the metro-

polis, by agreement with the London County Council, or in conjunction with the Middlesex County Council, in the promulgation of a Brent valley scheme. In the meantime every endeavour has been made with the limited plant available to maintain the works in a satisfactory manner, and to avoid pollution to the river into which the effluents are discharged. The precipitating tanks are unfortunately but little more than half the capacity that is desirable, and should be at once increased. The stiff clay land, so unsuitable for treatment, cannot be extended, but the existing area has been aerated as far as possible by ploughing and digging when cessation from the flooding of same is possible. The difficulty of leaving any area thus fallow may be fully understood when it is remembered that 76 acres only are available for the entire flow, which, during the past year, has been excessive owing to the abnormal rainfall. Great difficulty has been encountered in coping with the trouble, and this will be increased unless some tentative assistance is rendered in the shape of increased tank accommodation pending the final settlement of any new scheme to be adopted. Immediate steps should therefore be taken in this direction by doubling the capacity of the present tanks, as, whatever new scheme may be decided upon, some time must elapse ere it is complete for working, and in the meantime the district is not standing still, and the volume of sewage to be treated is daily increasing.

ENGINEERING STANDARDS COMMITTEE.—Mr. James C. Inglis, General Manager of the Great Western Railway, has been nominated by the Council of the Institution of Civil Engineers as one of their representatives on the Engineering Standards Committee, in the place of the late Mr. John Allen McDonald, Engineer-in-Chief of the Midland Railway.

WATER SUPPLY, RUSHDEN.—The new water-works at Rushden are now nearly completed. The contractor is Mr. A. E. Nunn, whose tender amounted to 65,000l., and the scheme was designed by Mr. R. E. Middleton, M.Inst.C.E.

DRAINAGE SCHEME, PARTRIDGE GREEN, SUSSEX.—On the 18th inst. a Local Government Board inquiry was held by Mr. W. O. E. Meade King, M.Inst.C.E., at the Partridge Green village hall, into the application of the Horsham Rural Council for a provisional order empowering them to acquire otherwise than by agreement land near Homelands Farm, West Grinstead, for purposes of sewage disposal for a portion of the parish, including Partridge Green, being formed into a special drainage district, and for sanction to borrow money for the purposes. Mr. W. Vaux Graham, the engineer of the scheme, gave evidence, and stated that it was proposed to acquire 4 acres of land, of which 4 acres would be used, the remainder being acquired to enable them to make a stream of water. After some discussion the inquiry closed.

SMOKE PREVENTION IN STRAM BOILERS.—The prevention of smoke from bituminous coal burned in a steam boiler can only be attained in an economical and satisfactory manner by perfect combustion. To attain this end, the furnace must be arranged so that the gases given off by the "green" fuel, together with a proper supply of air, shall travel over the length of the fire at suitable velocity, adequate space beyond the furnace must be provided for combustion to be completed, and a sufficiently high temperature is essential. Externally-fired boilers can easily be provided with secondary combustion chambers, but Lancashire and Cornish boilers cannot, except so far as the flues may be made to answer the purpose, and the water-cooled furnace arch presents an additional drawback. However, the regenerative bridge, mentioned on page 60 in our last week's issue, and a gas-heated diaphragm, described by Mr. Peter Fyfe at a meeting of the Institution of Engineers and Shipbuilders in Scotland, are calculated to obviate these disadvantages in internally-fired boilers. A final requisite is the adoption of well-designed mechanical stokers. Still, as Messrs. W. H. Booth and J. B. C. Kershaw say in their paper on "Fuel Economy in Steam Power Plants," read before the Institution of Electrical Engineers:—"Mechanical stoking does not eliminate the need for correct furnace forms, or for sufficient temperature, and proper mixture of air and gas." The H. H. H. smoke is sometimes prevented by excess of air supply in connexion with mechanical stokers, but this always means loss of economy. The prevention of smoke without waste of fuel can only be achieved by the scientific design of furnaces, flues, and stoking apparatus, together with careful and intelligent manage-

FOREIGN.

FRANCE.—The Department of l'Assistance Publique de Paris will shortly commence the works for the enlargement of the Cochon Record hospital.—The Department of Beaux-Arts is about to carry out important artistic works for the decoration of the Edouard d'Atene, called the "Salon des Autorités" at the foot of the large amphitheatre of the Sorbonne. Part of this decoration is to be entrusted to M. Henri Martin.—M. Rodin has completed his model for a monument which is to be erected to the memory of M. Henry Boque, the dramatic author.—M. Emile Robert, architect, of Clamart, has obtained the first premium in the competition for a Government Palace at Lima (Peru).—M. Labouze, Departmental Architect of La Charente, has been commissioned to carry out a new hospital at Barbezieux.—The municipality of Nancy has voted a sum of 510,000 francs for the formation of a public place in the new quarter of Sacré Cour. They are also devoting 750,000 francs to various works of road improvement.—A monument to the memory of Alphonse Karr is to be erected at St. Raphael.—The twenty-fourth exhibition of the "Union des Femmes Peintres et Sculpteurs" will open on February 1st at the Palais national in Champs Elysees, to close on March 9.—The Exhibition of the Association des Beaux-Arts de Cannes will open on March 1, to remain open during that month.

MINERALS IN EAST AFRICA.—In the annual report, just issued, on the East Africa Protectorate by Mr. Hobley, Assistant Commissioner, it is stated that during the past year numerous South African colonists, many of them well acquainted with the uses of rocks which bear mineral wealth, have traversed the country in several directions in the lookout for suitable land whereon to settle, but not one has reported any mineral deposits of such importance as to be attached to this negative evidence, but as year after year passes without some cheering discovery in this field one hopes that East Africa may contain great mineral wealth cannot fail to decline. The Lusina limestone continues to be sought, and proves satisfactory, its discovery having made it practicable to erect a number of substantial stone residences and public offices at Kisumu at a reasonable price. Limestone deposits have also been discovered at Makindu, and the concretionary nodules so abundant along the Athi Valley are being utilised. It is also proposed to work the ironstone beds near Voi, which were discovered by the Imperial British East Africa Company in 1892. Excellent bricks and tiles are turned out by the industrial section of the Church Missionary Society at Freetown, near Mombasa, but the industry has not yet attained any great dimensions, and as there is no reason why bricks should not cost the cost of rag now used for building in Mombasa, and why tiles should not supersede the unlovely corrugated iron. The collection, Nandi, has also burnt a quantity of bricks in the vicinity of the Government station, with which a substantial house has been built.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—Mr. James Williams, architect, of 11, Currier-street, Queen Anne's Gate, S.W., has taken into partnership Mr. Edmund H. Wratten, and the name of the firm will in future be "Williams & Wratten."

COMPENSATION AWARDS.—As we recently announced, an award of 139,000l. was adjudged by Mr. R. E. Middleton, who acted by request as umpire on the nomination of the Board of Trade, in respect of a claim preferred by Mr. W. H. Lever against the Corporation of Liverpool for their purchase of his property at Rivington for their works and supply. The Corporation had offered 4,000l. for the land, and, it appears, are dissatisfied with the award, for Mr. Lever has taken legal steps to obtain specific performance of the agreement to purchase, and claims payment of the sum awarded, interest, of his arbitration costs (some 10,000l.), and of damages.—At the Sheriff's Court, Red Lion-square, a special jury have awarded 27,432l. for the land, and, it appears, are dissatisfied with the award, for Mr. Lever has taken legal steps to obtain specific performance of the agreement to purchase, and claims payment of the sum awarded, interest, of his arbitration costs (some 10,000l.), and of damages.—At the Sheriff's Court, Red Lion-square, a special jury have awarded 27,432l. for the land, and, it appears, are dissatisfied with the award, for Mr. Lever has taken legal steps to obtain specific performance of the agreement to purchase, and claims payment of the sum awarded, interest, of his arbitration costs (some 10,000l.), and of damages.—At 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represented by Mr. C. A. Cripps, K.C., and Mr. Chester-Jones. Mr. Aoland, K.C., and Mr. Simon, and Mr. Eldon Bankes, K.C., and Mr. Nepean appeared for the two mortgagees. A jury of three returned a verdict in favour of the freehold of three houses in Edgware-road and Bell-street, taken by the Baker-street and Waterloo Railway Company, who were represented by Mr. Daniel Watney, Mr. Douglas Young, and Mr. A. R. Stenning; the claimant's surveyors being Messrs. Edmund Fox & Bousfield, Mr. J. G. Head and Mr. Elliott Tombs. In the suit of Blundell v. the King Mr. Justice Wright has delivered a judgment, with costs, in favour of Mr. W. J. Blundell, owner of some property near Liverpool, a portion of which has been taken for the erection of a military fort. An arbitrator assessed the value of the land at 12,642*l.*, and the damages for injury to the rest at 5,000*l.* As the Secretary of State for War demurred to the payment of the 5,000*l.* for injurious affection of the estate, Mr. Blundell petitioned, raising the question whether, in taking land for defence works, the Crown is not liable to pay compensation on the north side of the Thames. Sir John Rolleston, M.P., has decided that the War Office should pay 46,725*l.* to St. Thomas's Hospital for 230 acres of the Averley Hall estate, near Purfleet, Essex, to be taken as a rifle range. Sir E. Boyle, K.C., and Mr. Morton, and the Attorney-General, and Mr. H. F. Dickens, K.C., represented the claimants and the War Office respectively. Messrs. D. Watney, James Green, and W. H. Elwell gave evidence for the Crown, as for, say, 25,000*l.* compensation; on the other side Messrs. E. Towson, A. Savill, W. Eyo, and H. M. Cobb computed the total at about 84,700*l.*

ELECTRICITY SUPPLY: LONDON AND SUBURBS.—Amongst the Bills which have been prepared for next Parliamentary Session is a measure promoted by the Central Electric Supply Company, who seek for powers to take lands on the north-east side of Grove-road, St. John's Wood, for the erection of a generating and distributing station for the supply of a large number of metropolitan parishes on the north side of the Thames. Similar powers are sought by the County of London Electric Supply Company in respect of stations on the river Lea, at Bailey's-lane, Hackney, in Hill-street, Peckham, on the river Wandie, at Wandsworth, and in Graham-street, St. Luke's, and the supply of electrical energy or power in Tottenham, the City of London, and the boroughs of Hackney, Shoreditch, Southwark, Lambeth, and Battersea. A new undertaking, the East London and Lower Thames Electric Power Company, propose to produce energy and power for West Ham and the neighbouring urban districts and boroughs in the east and south-east of London, with works and stations in Grays Thurrock, Essex, Crescent Wharf, West Ham, in Blackwall-lane, and in Greenwich parish, wherein the specified lands extend over an aggregate of nearly 37 acres. Another fresh undertaking, the Administrative County of London and District Electric Power Company, will apply for leave to bring in a Bill to enable them to acquire the site of a round 73 acres at or near Bradfield-road, West Ham, Angerstein's Wharf, Greenwich, and Town Mead-road, Fulham, with an area of supply extending over the administrative County of London and adjoining municipal boroughs and urban and rural districts in Middlesex, Surrey, Kent, and Essex.

MUNICIPAL COUNCILS AND ARCHITECTURAL WORKS.—A number of metropolitan borough councils have decided to take no action on a letter received from the Royal Institute of British Architects, forwarding a memorial urging that the work of official architects should be restricted to structures of secondary importance unless such officials shall have passed the qualifying examinations of the Institute, and that the designing, etc., of all buildings of a monumental character should be entrusted to independent architects, to be selected in such a way as may seem best to the local authorities. At the meeting of the Hampstead Borough Council last week, however, the views expressed in the Institute's letter were strongly supported, and a motion adopting same was carried.

APPOINTMENT.—Sir C. Purdon Clarke, C.I.E., Director for Art of the Victoria and Albert Museum, South Kensington, has been offered and has accepted the appointment of Honorary Presidency of the national museum of America, the Metropolitan Museum, in Central Park, in succession to the late director, General di Cesnola. Sir C. Purdon Clarke will take up his new duties in the autumn.

INCORPORATED CHURCH-BUILDING SOCIETY.—This Society held its usual monthly meeting on Thursday, the 19th inst., at 7, Dean's-yard, Westminster; the Rev. Canon C. F. Norman in the chair. Grants of money were

made in aid of the following objects, viz.:—Building additional new churches at Cleve, St. Aidan, near Grimsby, 125*l.*; Rushdon, St. Peter, Northants, 100*l.*; and Elland All Saints, Yorks, 200*l.*, in lieu of a former grant of 55*l.*; rebuilding the church at Swinefleet, St. Margaret, Yorks, 50*l.*, in lieu of a former grant of 40*l.*; and towards enlarging or otherwise improving the accommodation in the churches at Northorpe, St. John the Baptist, near Lincoln, 15*l.*; and Purse Caudle, St. Peter, near Sherborne, Dorset, 10*l.* Grants were also made from the Special Mission Buildings Fund towards building mission churches at Beckton-road, Canning Town, London E., 50*l.*, in lieu of a former grant of 35*l.*; South Shields, St. Owen, Co. Durham, 10*l.*; Woodstone, St. Augustine, near Peterborough, 20*l.*; and Broker's Wood, All Saints, near Trowbridge, Wilts, 10*l.* The following grants were also paid for works completed:—Kendarrington, St. Mary, near Ashford, Kent, 15*l.*; Newington, St. Mary, near Sittingbourne, Kent, 10*l.*; Little Ilford, St. Barnabas, Essex, 25*l.*; making in all 100*l.*; Feckenham, St. John the Baptist, near Redditch, 30*l.*; Hampton, St. Andrew, near Evesham, Worcs., 35*l.*; and Catford, St. Andrew, Surrey, 200*l.* In addition to this the sum of 240*l.* was paid towards the repairs of twenty churches from trust funds held by the Society. The Society likewise accepted the trust of a sum of money as a Repair Fund for the Church of St. Peter, Pentre, Glamorgan.

"THE LOCAL GOVERNMENT ANNUAL."—"The Local Government Annual and Official Directory" for 1905 (27*a*, Farringdon-street, E.C.) is the fourteenth year of publication of a most useful and compact little work, which has been carefully edited and brought well up to date. The main portion of the book is devoted to the directory, which gives the names and addresses of the chief officials of all corporations, London borough councils, county councils, boards of guardians, urban and rural district councils, county and borough asylums, etc., throughout the Kingdom, as well as the public libraries, public parks, and City companies of London. A feature is the insertion of the names of the chairmen of committees in the metropolitan boroughs, also the chairmen of the London County Council committees. The names and addresses of the members of the Metropolitan Water Board have been inserted, and a complete scale of charges in every district. Another section consists of a list of the various education committees in England and Wales. The title and locality of each are given, together with the name of the secretary. In addition to the directory, there is useful information relating to the public libraries, baths and washhouses, and electric light undertakings in the boroughs of London, and an abstract of the Local Government legislation of 1904. There is also a list of all the parks and open spaces of the metropolis, with the local authorities controlling them. The price of the "Annual" is 1*s.* 6*d.*

THE USE OF THE PATENT OFFICE LIBRARY.—It must have often happened to builders, architects, and others to have experienced difficulty in ascertaining the name and address of the makers of some article of which they required a duplicate or parts for repair. Most traders are doubtless familiar with the fact that a very large number of articles are stamped or marked with a registered number, but few probably are aware that, at the Free Library of the Patent Office, a register is kept wherein, after a short search, the name and address of the firm or person whose design bears one of the above-mentioned numbers may be found. To those who know this, and live sufficiently near London to make use of it, it has, no doubt, been very serviceable; but the recent decision of the Comptroller to forward information through the post on receipt of a small fee will now place this source of information at the service of traders all over the country. Any trader who desires to be furnished with a copy of the register relating to any particular article will on application to the Comptroller of the Patent Office (Designs Branch), 25, Southampton-buildings, London, W.C., quoting the registered number of the article and enclosing a postal order for 1*s.*, in due course, receive a copy of the entry. We cannot help thinking that this will prove a boon to many of our readers, and add to the usefulness of the Patent Office Library.

THE NEWCASTLE CITY WALLS.—A discussion took place at the annual meeting of the Newcastle Society of Antiquaries, on Wednesday, on the proposed demolition of the Plummer Tower and the preservation of the town walls. The Duke of Northumberland said that ancient monuments were often safest in private hands, but in cases like city walls, where none had an individual interest, public charge was desirable. He suggested it would be well if Newcastle's ancient walls could be

placed in the care of a body appointed under the Ancient Monuments Act. It was pointed out that York, Canterbury, Southampton, and other towns with ancient walls were very proud of their walls, and it was resolved that the council of the society be instructed to take immediate steps with respect to the preservation and custody of the old towers and walls.

CAPITAL AND LABOUR.

EMPLOYMENT IN THE BUILDING TRADES.—Returns received from seventy-nine Employers' Associations show that employment in December was dull, and rather worse than a month ago. It was much worse than a year ago. Employment with carpenters and joiners was bad, and worse than a year ago. Employment of unemployed trade union carpenters and joiners was 115 at the end of December, compared with 101 in November, and 79 in December, 1903. With plumbers employment in December was bad and much the same as in November, but it was worse than a year ago. The percentage of unemployed trade union plumbers was 100 in December, compared with 102 in November, and 77 in December, 1903. With bricklayers employment generally was dull, and about the same as a month ago, but rather worse than a year ago. With masons it was dull generally, and worse than a month ago and a year ago. With painters employment was bad, although slightly better than in November; but it was worse than a year ago. Employment with plasterers was dull, and about the same as last month; it was worse than a year ago. With slaters and tilers employment was dull generally, but slightly better than a month ago; it was rather worse than a year ago.—*Labour Gazette.*

Legal.

LEEDS ANCIENT LIGHT DISPUTE.

MR. JUSTICE BRAY, in the King's Bench Division, on the 20th inst., delivered a considered judgment in the case of Ambler and another and the Bishop of Leeds upon a point of law raised in the form of a special case relating to the finding of the late Mr. Thos. Blashill, the umpire, appointed by the arbitrators in respect to the interference with the light to the plaintiffs' premises by the erection of the Roman Catholic Cathedral opposite. (The case was reported in last week's issue of the *Builder*.)

In this case the plaintiffs, the owners of premises in Cookridge-street, Leeds, contended that the cathedral opposite interfered with the ancient lights of the premises, part of which had been used by the plaintiff, Mr. H. Ambler, an architect, for the purposes of his offices, including a drawing office, for which a special amount of light was required. A slight but not material interference with light was caused to the parts of the plaintiffs' premises for which a special amount of light was required. Arbitration proceedings took place, and, in the result, the umpire awarded and found as follows:—"Notwithstanding the defendant's buildings, there remains sufficient light to the plaintiffs' premises for all purposes of ordinary user, and the plaintiffs are not entitled to damages for interference with such ordinary user; but if I am entitled to take into account damages which the plaintiffs have sustained in respect of loss of light to those parts of the premises used for occupation in respect of which a special amount of light is required, then I award 600*l.*" The umpire further added:—"At the request of both parties, I submit for the opinion of the Court above, whether, on the foregoing facts, I am bound by the decision in the case of the Home and Colonial Stores v. Colls, and therefore cannot award damages to the plaintiffs, or whether I can award damages in respect of interference with such special user of light as aforesaid." The arguments having concluded on the 14th inst., his lordship reserved his judgment.

His lordship, in giving judgment, said that, in examining the contentions put forward by the plaintiffs, it was necessary for him to what was meant by the expression which was used in the judgments of the House of Lords in the *Colls* case, "ordinary user" or "ordinary business" or "ordinary purposes." He thought the word "ordinary" was used solely with reference to light, and an ordinary user or an ordinary business meant a user or business which, in fact, required only an ordinary amount of light. That was a question of fact, and must depend on the evidence in each individual case. He did not think that it was even mixed fact and law; but

The defendant, in his defence, denied that

At the close of the defendant's case, Mr. Spokes addressed the jury on behalf of his client. He said that if the scale of the Royal Institute of British Architects was to be

While working on the new building, and in the course of his employment, the applicant was injured. When the accident occurred, the trenches for the footings of the walls of the new portion of the building had been made

and most of the footings had been put in the trenches, and in places the walls of the new building had been carried up about 20 ft. high. No part of the walls of the new building at the time of the accident had been actually connected with the existing building, but the footings upon which the walls of the new building were to be built were in touch with the wall of the existing building. No entrances or means of communication had at the time been made between the existing building and the new one. The end wall of the existing building was intended to form part of the new building when it was completed. The new building was being constructed by means of scaffolding, and the applicant was injured by falling off the scaffolding whilst carrying up building materials. The defendant's case was that the applicant's employment was not one to which the Act applied, as he was not, at the time of the accident, employed in, or about a building exceeding 30 ft. in height. The Court Judge, however, held that the applicant's employment came within the Act, as, in his opinion, if the two buildings were intended ultimately to form one building, or to form two buildings, to both of which an existing party or parties in absolute touch with, the common absolute physical attachment of the new to the old building, was not necessary so long as the building operations were being carried on in connexion with, and having regard to, both buildings. He found, as a fact, that those footings so prepared extended up to, and were in absolute touch with, the wall of the existing building, and that such footings were a substantial part of the work of the new building. He accordingly made an award in favour of the applicant in the sum of £25. 6d. a week.

At the conclusion of the arguments of counsel, the judge held that the new building, being merely an extension of the old one, it could be said that the two were separate, and therefore that the applicant was employed upon the extension of a building exceeding 30 ft. in height, and was thus entitled to compensation under the Act. The appeal was accordingly dismissed, with costs.

Mr. Dankwerts, K.C., and Mr. Minton-Senhouse appeared for the appellant, and Mr. Ruegg, K.C., and Mr. John O'Connor for the respondent on the appeal.

DAMAGE THROUGH BUILDING OPERATIONS.

The case of *Bishop v. W. B. Mew, Langton, Bishop, & Co.*, came before Mr. Justice Warrington, sitting as an additional judge of the King's Bench Division, on the 19th and 20th insts., an action by the plaintiff, Mr. J. Bishop, of Union-street, Ryde, Isle of Wight, against the defendants to recover 200l. damages for injury caused to his premises by certain alterations carried out by the defendants, the adjoining owners.

Mr. Ernest Pollock, for the plaintiff, said that the premises were separated by a very old party wall only 4½ in. thick, which was half the usual thickness. In August, 1901, the defendants began to make alterations to their premises for the purpose of adding one story to the height, and the plans were passed by the local authority. For the purpose of the new story the defendants had to build a substantial wall, 11 in. thick. They did not rebuild the whole of the party wall from the bottom up, but put an 11 in. iron girder on a 4½-in. wall, so that half of it projected over the plaintiff's premises, and on that they built the 11 in. wall.

His lordship said that that was a technical case.

Mr. Pollock said that, in addition to mere repairs, the defendants had another difficulty dealt with. Their premises were very old, having been built in the early part of last century, and three joints had been carried up to the party wall. There had been actual interference with these joints, with the result that considerable damage had been done to the plaintiff's premises, which it would be necessary to alter.

Evidence having been given in support of the plaintiff's case, the defendants called evidence to prove that the damage complained of was due to the vibration inevitable from building operations, and could be remedied by the expenditure of a very small sum. It was also declared that the encroachment of the iron girder in no way affected the appearance of the plaintiff's shop or depreciated the value of his property.

The result of the evidence, in giving judgment, said that the evidence he must come to the conclusion that the damage done to the plaintiff's shop was due to a wrong done by the defendants. He also thought that the plaintiff claimed too much, he was entitled to substantial damages in respect of

the encroachment. On the whole he thought that justice would be done if he awarded the plaintiff 75l. damages and costs.

ERECTOR OR DEMOLITION.

At the Guildhall (City Summons Court), before Alderman Sir George Faudel-Phillips, Bart., Thomas Frost, foreman in the employ of Messrs. Staines & Sons, builders, 61, Great Eastern-street, E.C., appeared to answer two summonses, the first under the London Public Health Act, for removing old building material from a house in course of demolition during prohibited hours; the second for causing a van to be drawn up alongside the footway for the removal of the same. Police Constable Clements deposed that at 11.30 on the 11th inst. he saw two men in defendant's employ carrying old bricks, dried mortar, and concrete from the basement of No. 2, Camomile-street, in baskets to a van that was drawn up by the footway. He asked defendant whether he knew his men were committing an offence, when he replied, "That point has not been contested yet." He admitted that he was responsible for the men, and said they should stop bringing old material out and should only remove earth. Witness saw that the men continued bringing out the same stuff, with a top covering of earth. City Sergeant 78 corroborated this evidence, when defendant said his contention was that, inasmuch as he was rebuilding and not demolishing, he was not liable under this Act. The house had been pulled down by another firm, and he was employed to rebuild. In answer to Sir George, Constable Clements said the side walls of the house in question were standing. Sir George: I take it that in excavation prior to rebuilding you were removing some of the old foundation. I have it on sworn evidence that you were removing old bricks, etc., and that there was a dust from it on the footway. Defendant: But I was not demolishing, sir. Sir George: But you were removing refuse that was there through the act of demolition. Under the circumstances, however, I shall only order the payment of costs in both summonses.

PATENTS OF THE WEEK.

APPLICATIONS FOR PATENTS.

26,290 of 1903.—C. J. BARHAM: *Kilns for Drying and Burning Bricks.*

A combined brick burning and drying kiln, consisting in the combination with the burning and drying chamber or chambers of a radiator or radiators formed of metal flues leading from the burning chambers and lining the drying chamber, and finally opening thereinto, said radiator constituting the means for arresting the particles in suspension in the products of combustion which are passed through said radiator, and also for imparting heat to the drying chamber and for cooling the products of combustion before coming into contact with the bricks in the drying chamber.

28,773 of 1903.—R. HARRINGTON and WALTER MARTINWAT: *Lock-nuts for Screw-bolts.*

A lock-nut, consisting of a strip of suitable elastic material coiled or twisted and tapped with a thread of slightly smaller diameter than that of the thread on the screw-bolt for which the nut is intended.

605 of 1904.—W. L. HALEY: *Ships' Sidelights; also Applicable for Buildings and the like.*

This invention relates to ships' sidelights; also applicable for buildings and the like. Hitherto, when the hinged or swinging glass is open for ventilating purposes it is liable to be swung out of position when the vessel rolls or pitches. The invention consists in a means for securing or locking the open glass at any desired position or extent of opening. The hinged bolt of the frame holder carrying the glass is extended upwards so as to project beyond the top of the hinge. This projecting part is screwed to receive a screw of partial rotation to the nut the top of the hinge is bound or locked by the pressure of the nut. For this purpose the bolt of the hinge is locked or prevented from turning by passing a set screw through the socket of the hinge and through the bolt.

1,834 of 1904.—C. R. PENDOCK and S. EDWARDS: *Hoists, Lifts, or Elevators.*

Lifts or hoists, and the like, where the control rope passes through the interior of the cage, preventing, by the same combination of mechanism operated by one action from within the cage, the doors of any landing from being opened except when the cage is

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

immediately opposite that landing, and, conversely, preventing the cage being set in motion until the approach doors are bolted, the arrangement being such that the mechanical freedom of the cage and of the control rope is not affected.

4,628 of 1904.—J. SHANKS: *Water-closets.*

A water-closet, consisting in the combination and arrangement of a casing in which works a weighted plunger actuated by a lever or handle and carrying a locking cam slot plate controlling a lever operating a discharge valve, the plate also actuating a supply valve in the casing, and having on it an incline capable of engaging a set pin in the casing, the casing being made in parts and so arranged that the position of the supply connexion and the discharge valve spindle may be altered to suit its being applied to the closet in various positions.

5,590 of 1904.—A. A. HOPKINSON: *Hoisting Apparatus.*

Hoisting apparatus, in which the hoisting ropes pass over a grooved driving pulley in opposite directions, the intermediate part of the rope hanging in a loose bight maintained by the weight of the rope itself.

11,321 of 1904.—H. LAMBERT: *Self-locking Nut.*

This invention relates to lock-nuts, and consists in so forming the two parts of a divided nut or of two separate nuts that the locking is effected by screwing back one of the nuts or parts, and conversely the unlocking is brought about when one of the nuts or parts is rotated towards the other, or when the two nuts or parts are rotated together to approach each other.

15,549 of 1904.—F. W. BROADBENT: *Burning of Pipes, Conduits, Chimney-pots, Channels, and other Like Earthenware Goods in Kilns or Ovens.*

A bond, consisting of a plate having holes therein agreeing in position with the channels of the goods to be stowed thereon, the side or edge of the plate being shaped to provide ventholes or passages when several are placed with their sides meeting, and either having projections thereon or not.

18,566 of 1904.—C. B. CREED: *Window Sashes.*

This relates to window sashes, whereby the danger attached to cleaning windows from the outside is overcome by the addition of a strip of wood at the edge of the sash to act as a runner for working the sash up and down, the screw by which the runner is screwed to the sash acting as a pivot for working the sash inwards.

21,877 of 1904.—W. PERRINS and JOSEPH NORTH: *Blind and like Rollers.*

A spring clip to partly embrace a blind roller for the purpose of clipping the upper edge of the blind between one end of the clip and the roller, the other end of the clip being or not serrated to prevent slipping.

24,795 of 1904.—A. A. GERY: *Tunnel Kilns for Burning Bricks or other Articles.*

A car for tunnel kilns, consisting in the combination with the angle-bar, side-frames, and connecting arch, of pyramidal skew-backs for the arch, and wedge-shaped spandrel blocks between said skew-backs and the vertical portion of the side-frames, the upper portion of said spandrel blocks being formed with inclined flange abutments.

25,528 of 1904.—A. MOHR: *Walls, Ceilings, and the like.*

Hollow ceilings and walls of beton, with or without iron insertions, formed of solid beton beams of suitable sectional form, if necessary with solid beton planks, interposed and so placed together as to form hollow spaces or chambers in the ceilings or walls, cement mortar, or the like being run in between the beams or sections so as to firmly connect them together.

25,551 of 1904.—G. P. WADSWORTH: *Means for and Method of Displaying Curtains, and the like.*

A rack for displaying curtains, and the like, comprising a fixed upright rod, and a number of rectangular or U-shaped arms or brackets extending horizontally therefrom, such arms being arranged to be turned or swung upon the said rod so that they slightly overlap each other vertically when closed, and can be opened out radially from the said rod.

25,692 of 1904.—W. FLETCHER EAVES: *Boiler Settings and Chimney Settings therefor.*

A setting for containing a boiler, consisting in foundations sufficient to carry the boiler, a combustion chamber provided with baffles or deflectors, walls for forming return flues on either side of the boiler, and for supporting a saddle, such saddle being the uptake common to both such return flues, and also forming the base of a flue supporting an ordinary chimney.

25,869 of 1904.—J. W. WYNN: *Sash Holders and Locks*.

This consists in the combination with a window, including a frame and a sash, slidably mounted in the frame of oppositely directed ratchet bars secured to the frame, at opposite sides of the sash, brackets secured to the sash at opposite sides thereof, dogs pivoted in the brackets and arranged for movement into and out of engagement with the ratchet bars, and means for holding the dogs yieldably in such position.

25,870 of 1904.—W. W. WISE, J. J. COOPER, and W. L. MILLER: *Nut Locks*.

A nut lock, comprising a bolt, having one of its ends screw-threaded and bifurcated, a screw-threaded nut having a working fit upon the screw-threaded end of the bolt, said nut having one of its faces roughened, and a T-shaped wedge fitting in such bifurcation that the head portion thereof registering with the roughened surface of the nut, the wedge having one side of its shank portion provided with teeth for engagement with one wall of the said bifurcation to prevent accidental withdrawal of the key therefrom, the head and shank portion of the key being formed of a single piece of material.

25,876 of 1904.—W. ECKSTEIN and G. F. PITVAR: *Joints of Glazing Bars*.

According to this invention a hole is made in the web of one of the bars through which is passed a key for locking the two bars together. When the key is in position it is upset on both sides of the web to prevent it from working out of the hole, but preferably a key split at one or both ends is used, the ends being turned over against the web after the key has been inserted into the hole.

25,888 of 1904.—H. HERNANDEZ and H. LAVILLIETTE: *Construction of Roofs*.

This relates to a roof framing with equilateral sides, characterized by a supporting vertical girder, from which the two sides are suspended, and the weight thereof equilibrated, and by the arrangement of a horizontal framework designed to resist lateral strains or stresses on either of the roof sides, the rafters and other necessary parts of the covering being arranged according to the desired form of roofing.

25,969 of 1904.—J. WETTER (C. W. Bals & Co.): *Door Locks*.

This consists in the combination of a door lock having a latch, with two pairs of spring-actuated shackles, one being adapted to hold the door in the open position, and the other to retain it in the closed position.

16,934 of 1904.—H. H. LAKE (W. M. Jewell): *Purification of Water*.

A method of purifying water, which consists in employing a reagent substantially insoluble in the water to be treated, adapted to react with the impurity to be affected so as to produce an insoluble compound, and effecting chemical reaction between such reagent and the impurity to be affected.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

January 16.—By JONES, LANG, & CO.

City.—118, Queen Victoria-st. (business premises), u.t. 48 yrs, g.r. 180, y.r. 9700, £5,150
22 and 23, Fenchurch-st., and 2, Good-lane, 3,400 ft., building lease for 80 yrs, let at per annum 1,920

January 17.—By DIXON & CO.

Sutton, Surrey.—Carshalton-rd., "Kristan-pore," u.t. 80½ yrs, g.r. 7½, a.r. 450, £400

By MERVIN & ADAMS.

Leyton.—Canterbury-rd., "Beulah," 4, p. £200

January 18.—By H. DONALDSON & SONS.

Hackney.—226, Amhurst-rd., u.t. 42½ yrs, g.r. 6½, p. £490

By W. A. ELLIS.

South Kensington.—17, Egerton-gdns., u.t. 7½ yrs, g.r., etc., 33½, p. £1,125

By FORTESCUE & BRANSON.

Fulham.—34, Humbolt-rd., with forge, stabling, etc., f. ar. 4500, £5,000

Bayonne-rd., f. ar. 100, 100, reversion in 85 yrs, £294

Adeney-rd., f. ar. 6½, reversion in 8½ yrs, £168

g.r. 20½, y.r. 1200, £1,280

Hammersmith.—125, King-st. (s.), and 1, Down-pl., with warehouses and stables in rear, u.t. 50½ and 37 yrs, g.r. 10½, £2,080

g.r. and y.r. 1600 (with goodwill) 2,315

127 and 129, King-st. (s.), u.t. 30½ yrs, g.r. 12½, y.r. 1450, £3,250

Chiswick.—31 to 49 (odd), Mawson-lane, and 2 to 12 (even), Eastbury-gr., u.t. 90 yrs, g.r. 1000, y.r. 6700, £570

30, Balfour-gr., f. y.r. 850, £650

By DOUGLAS YOUNG & CO.

Camden Town.—13, Rochester-st., u.t. 10 yrs, g.r. 6½, y.r. 500; also f. ar. 100, u.t. 40 yrs, g.r. 11½, £650

January 19.—By H. J. BUSS & SONS.

Bethnal Green.—207, 209, and 211, Cambridge-rd., and 73 and 75, Three Colts-lane, £1,420

Hackney.—52 to 56, Nelson-st., u.t. 51 yrs, g.r. 17½, 108, w.r. 1750, 108, £1,410

By NEWBORN, EDWARDS, & SHEPHERD.

Orpington, Kent.—1A and 1 to 6, St. Andrew's Cottages, f. w.r. 93½, 125, £510

Dulwich.—24, 26, 28, 30, 32, and 34, Dulwich-rd., u.t. 73½ yrs, g.r. 28½, 108, w.r. 202, 108, £1,200

By STIMSON & SONS.

Vauxhall.—147, Vauxhall-walk (warehouses, yard, etc.), f. ar. 750 (including goodwill), £4,100

Battersea.—Carpenter-st., f. ar. 40½, reversion in 15 and 16 yrs, £920

Lambeth.—Site of 32 and 33, Albert-embankment, f. 600

Kennington.—53 and 55, Neville-st., f. w.r. £510

Lambeth.—9 and 10, Pratt-st., f. w.r. 78½, £780

Vauxhall.—8, Leopold-st., u.t. 57 yrs, g.r. £240

South Lambeth.—2, Devonshire-rd., f. y.r. 450, £370

Fentiman-rd., f. ar. 30½, u.t. 33 yrs, g.r. 4½, 35, 42, and 46, Thorne-st., f. ar. 390, £680

154, w.r. 124½, 160, u.t. 50 yrs, g.r. 30, £280

3, Meadow-pl., u.t. 63 yrs, g.r. 5½, w.r. 33½, 108, £450

1 and 2, Little Ruidland-st., u.t. 50 yrs, g.r. 12½, w.r. 57½, 48, £435

Clapham.—32, Union-rd., u.t. 57 yrs, g.r. 6½, y.r. 450, £160

Wandsworth.—43, Dawson-st., u.t. 50 yrs, g.r. 32½, 118, 9d., w.r. 26½, £750

Battersea.—27 to 35 (odd), Euxaria-st., u.t. 57 yrs, g.r. 18½, w.r. 120, £820

21, Carpenters-st., u.t. 66 yrs, g.r. 40, w.r. 28½, 128, £360

Lambeth.—69, York-rd. (s.), u.t. 18½ yrs, g.r. 10½, y.r. 570, £820

78, York-rd., u.t. 21½ yrs, g.r. 12½, y.r. 60½, £730

126, 128, and 180, York-rd., and 17, Chicheley-st., w.r. 1904, 26; also f. ar. 430, 60, u.t. 18 yrs, g.r. 70½, £350

Bermondsey.—4, 6, 8, 12, 14, and 18, Guy-st., u.t. 8 yrs, g.r. 24½, w.r. 218½, 88, £245

Old Kent-road.—25, Ossary-rd., u.t. 34½ yrs, g.r. 5½, w.r. 365, 88, £1,800

49 to 61 (odd), Ossary-rd., u.t. 34½ yrs, g.r. 35½, w.r. 219½, 108, £245

2, Olmar-st., u.t. 34½ yrs, g.r. 5½, w.r. 124½, 108, £325

Lovegrove-st., 18, Kent-st., f. w.r. 31½, 48, £285

Pinchcock.—75, Edlington-st., u.t. 24½ yrs, g.r. 5½, y.r. 57½, 128, £285

Cricklewood.—41, Ashford-rd., u.t. 88 yrs, g.r. 5½, 88, y.r. 50½, £630

Stockwell.—54, 56, and 58, Aylton-rd., u.t. 33½ yrs, g.r. 21½, 18, 64, y.r. 124½, £850

Battersea.—36 to 44 (even), Sleaford-st., f. w.r. 70½, 68, £600

Camden-rd.—7 to 19 (odd), Euseb-st., u.t. 5½ yrs, g.r. 21½, w.r. 172½, 188, £1,010

Peckham.—1, Willowbrook-rd. (s.), u.t. 17½ yrs, g.r. 32½, y.r. 31½, 48, £115

22 to 27, Ophir-rd., u.t. 45½ yrs, g.r. 13½, y.r. 1500, £940

Old Kent-road.—2, Hyndman-st., u.t. 80½ yrs, g.r. 4½, w.r. 40½, 168, £190

January 20.—By CARTWRIGHT & ETCHE.

Edgware-road.—1 and 2, Queen's-bar., u.t. 27 yrs, g.r. 100, w.r. 220, 188, £350

By HUNTER & HUNTER.

Hyde Park.—33, Craven-ter., f. y.r. 1100, £1,970

Kennington.—19, Colet-gdns., u.t. 36 yrs, g.r. 8½, p. £510

Clapham.—31, 33, and 35, Henge-rd., u.t. 57 yrs, g.r. 15½, 128, y.r. 1000, £900

By PEMBERTON & BANKS.

Hyde Park.—7, Leinster-st. (s.), u.t. 33½ yrs, g.r. 10½, w.r. 70½, 68, £370

By G. A. WILKINSON & SON.

Knightbridge.—Montpelier-rd., f. ar. 44½, 28, reversion in 24½ yrs, £1,700

Belgrave.—Elizabeth-st., the "Royal Oak" pub., f. ar. 60½, u.t. 19 yrs, with reversion 980

Maida Vale.—Warrington-cres., f. ar. 130½, u.t. 54½ yrs, g.r. 25½, £2,100

Putney.—High-st. (s.), area 1,160 sq. ft., y.r. 1500, £3,200

Contractions used in these lists.—F. r. for freehold ground-rent; L. r. for leasehold ground-rent; i. r. for improved ground-rent; g. r. for ground-rent; p. r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e. r. for estimated rental; w. r. for weekly rental; q. r. for quarterly rental; y. r. for yearly rental; u. t. for unexpired term; p. a. for per annum; y. r. for years; l. a. for lease; s. t. for street; f. ar. for frontage; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gds. for gardens; yd. for yard; g. for grove; b. b. for beach; pub. for public-house; o. for offices; s. for shops; c. for court.

MEETINGS.

FRIDAY, JANUARY 27.

Architectural Association.—Mr. J. B. Fulton and Mr. B. F. Reynolds on "Byzantine Architecture." 7.30 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. T. L. Matthews on "Concrete-making on the Admiralty Harbour Works, Dover." 8 p.m.

MONDAY, JANUARY 30.

Surveyors' Institution.—Discussion on (1) the paper by Mr. Stenning on "Urban and Rural By-Laws and suggested Amendments," and (2) the paper by Mr. Menzies on "Building By-Laws in Rural Districts." 8 p.m.

TUESDAY, JANUARY 31.

Northern Architectural Association.—Mr. J. Eadie Reid on "Designing for Mosaics and Stained Glass." 7.30 p.m.

Institute of Sanitary Engineers, Ltd. (Lecture in Practical Sanitary Science).—Professor H. Adams on "Supervision of Works in Progress." 7 p.m.
Society of Arts (Applied Art Section).—Messrs. E. Johnston and P. Hewitt on "Calligraphy and Illumination." 8 p.m.
Institution of Civil Engineers.—Mr. L. R. Clark on "Floating Docks." 8 p.m.

WEDNESDAY, FEBRUARY 1.

Architectural Association (Discussion Section).—Mr. A. C. Dickie on "Steps and their Treatment." 7.30 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

Institute of Sanitary Engineers, Ltd.—President's address by Mr. J. A. Crowther: "The By-Laws." 7 p.m.

Society of Arts.—Sir William H. Preese, K.C.B. F.R.S., on "The Navigation of the Nile." 8 p.m.

Institution of Civil Engineers.—Students' visit to the National Physical Laboratory, Bushy House, Teddington. 2.30 p.m.

THURSDAY, FEBRUARY 2.

Royal Institution.—Professor W. Schlich on "Forestry in the British Empire." L. 5 p.m.

Society of Antiquaries.—3.30 p.m.

FRIDAY, FEBRUARY 3.

Junior Institution of Engineers (Westminster Palace Hotel).—A paper on "Recent Developments in Electric Lighting" will be read by Professor H. T. Davidge. Wh.Sc. 8 p.m.

SATURDAY, FEBRUARY 4.

Sanitary Inspectors' Association.—Twenty-second annual dinner, Venetian Chamber, Holborn Restaurant. 6.30 p.m.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items which have been duplicated for other journals) are NOT DESIRED.

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We are compelled to decline pointing out books and giving addresses.

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All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other commercial matters should be addressed to THE PUBLISHER, and not to the Editor.

PRICES CURRENT OF MATERIALS.

Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices, and which should be remembered by those who make use of this information.

BRICKS, &c.

Hard Stocks £ s. d.
1 12 0 per 1000 alongside, in river

Best White and Glazed 1 8 0 " " " "

Facing Stocks 2 5 0 " " " "

Shippers 2 5 0 " " " "

Fletions 1 8 0 " " " "

Best Firebricks 3 12 0 " " " "

Best Red Pressed 5 0 0 " " " "

Best Blue Pressed 4 4 0 " " " "

Do. Bulbous 4 10 0 " " " "

Best Scourbridge 4 8 0 " " " "

Fire Bricks, &c.

Best White and Glazed 12 0 0 " " " "

Stretchers 11 0 0 " " " "

Quoins, Bulbous, and Flats 15 0 0 " " " "

Double Stretchers 19 0 0 " " " "

Double Headers 16 0 0 " " " "

One Side and two Ends 19 0 0 " " " "

Two Sides and one End 20 0 0 " " " "

Spalls, Chamfered, Squints 20 0 0 " " " "

Best Dipped Slates 12 0 0 " " " "

Quoins, Bulbous, and Flats 14 0 0 " " " "

Double Stretchers 15 0 0 " " " "

Double Headers 14 0 0 " " " "

One Side and two Ends 15 0 0 " " " "

Two Sides and one End 15 0 0 " " " "

Solers, Chamfered, Squints 14 0 0 " " " "

Second Quality 2 0 0 " " " "

Dipped Slates 2 0 0 " " " "

Glazed 2 0 0 " " " "

BRICKS, &c.—(continued).

Thames and Pitt Sand.....	5 d	0 per yard, delivered.
Thames Ballast.....	5 9	" "
Best Portland Cement.....	37 0	per ton, "
Best Ground Blue Lias Lime.....	20 0	" "
Note.—The cement or lime is exclusive of the ordinary charge for sacks.		
Grey Stone Lime.....	12s. 6d.	per yard, delivered.
Stourbridge Fireclay in sacks.....	27s. 6d.	per ton at rly. dep't.

STONE.

Barn Screws—delivered on road wag- gon, Paddington Dep't.....	s. d.	1 6d per ft. cube.
Do. do. delivered on road waggon, Nine Elms Dep't.....	1 8d	" "
Portland Stone (20 ft. average)— Brown Whitbed, delivered on road waggon, Paddington dep't, Nine Elms dep't, or Fulham Wharf.....	2 1	" "
White Bashed, delivered on road waggon, Paddington dep't, Nine Elms dep't, or Fulham Wharf.....	2 2d	" "
Ancaster in blocks.....	s. d.	1 1 per ft. cube, del'd. rly. dep't.
Beaumont.....	1 0	" "
Greenhill.....	1 10	" "
Darley Dale in blocks.....	2 4	" "
Red Cornhill.....	2 0	" "
Chesham Bed Freestone.....	2 4	" "
Red Mansfield.....	2 0	" "

York Stone—Robin Hood Quality, Scrapped random blocks.....	2 10	" "
6 in. sawn two sides landings to sizes.....	2 8	per ft. super.
6 in. rubbed two sides ditto.....	2 6	" "
6 in. sawn two sides slabs (random sizes) 0 11d	" "	" "
2 in. to 2 1/2 in. sawn one side slabs (random sizes) 0 7d	" "	" "
1 1/2 in. to 2 in. ditto, 0 6	" "	" "
Hard York— Scrapped random blocks.....	0 per ft. cube.	" "
6 in. sawn two sides, landings to sizes (under 40 ft. super.).....	2 8	per ft. super.
6 in. rubbed two sides ditto.....	3 0	" "
3 in. sawn two sides (slabs random sizes).....	1 2	" "
2 in. self-faced random flats.....	0 5	" "

Hopton Wood (Hard Bed) in blocks.....	2 3	per ft. cube, del'd. rly. dep't.
" " " 6 in. sawn both sides landings.....	2 7	per ft. super.
" " " 3 in. do. 1 2d	" "	del'd. rly. dep't.

SLATES.

in. in. 2 s. d.		
20 x 10 best blue Bangor.....	13 2	6 per 1000 of 1200 at r. d.
20 x 12 " " " " " " " "	13 17	6 " "
20 x 10 first quality " " " "	12 0	0 " "
20 x 12 " " " " " " " "	13 15	0 " "
18 x 8 " " " " " " " "	7 5	0 " "
20 x 10 best blue Port- madore.....	12 12	6 " "
16 x 8 " " " " " " " "	6 12	6 " "
20 x 10 best Eureka un- baling green.....	13 17	6 " "
18 x 10 " " " " " " " "	13 7	6 " "
18 x 10 " " " " " " " "	13 5	0 " "
18 x 8 " " " " " " " "	10 5	0 " "
20 x 10 Imperial green.....	11 12	6 " "
18 x 10 " " " " " " " "	9 12	6 " "
16 x 8 " " " " " " " "	6 12	6 " "

TILES.

Best plain red roofing tiles.....	42	0 per 1000 at rly. dep't.
Hip and Valley tiles.....	3 7	per doz. " "
Best Bovey tiles.....	50	0 per 1000 " "
Do. Ornamental tiles.....	32	6 " "
Hip and Valley tiles.....	4	0 per doz. " "
Best Bovey red, brown, or branded do. (Edwards).....	57	6 per 1000 " "
Do. Ornamental do.....	50	0 " "
Hip tiles.....	4	0 per doz. " "
Valley tiles.....	3	0 " "
Best Red or Marbled Stafford- shire do. (Peakes).....	51	9 per 1000 " "
Do. Ornamental do.....	54	6 " "
Hip tiles.....	4	1 per doz. " "
Valley tiles.....	3	8 " "
Best "Rosemary" brand plain tiles.....	48	0 per 1000 " "
Best Ornamental tiles.....	50	0 " "
Hip tiles.....	4	0 per doz. " "
Valley tiles.....	3	8 " "
Best "Hartshill" brand plain tiles and faience.....	50	0 per 1000 " "
Do. pressed.....	57	6 " "
Do. Ornamental do.....	50	0 " "
Hip tiles.....	4	0 per doz. " "
Valley tiles.....	3	6 " "

WOOD.

Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in. and 15 10 0	At per standard.	2 s. d.
Deals: best 3 in. by 9 in. and 11 in. and 15 10 0		16 10 0
Deals: best 3 in. by 9 in. and 11 in. and 15 10 0		15 10 0
Deals: best 3 in. by 9 in. and 11 in. and 15 10 0		15 10 0
Deals: best 3 in. by 9 in. and 11 in. and 15 10 0		15 10 0
Deals: best 3 in. by 9 in. and 11 in. and 15 10 0		15 10 0
Deals: best 3 in. by 9 in. and 11 in. and 15 10 0		15 10 0
Deals: best 3 in. by 9 in. and 11 in. and 15 10 0		15 10 0
Deals: best 3 in. by 9 in. and 11 in. and 15 10 0		15 10 0
Deals: best 3 in. by 9 in. and 11 in. and 15 10 0		15 10 0

WOOD (continued).

Fir timber: best middling Danzig or Memel (average specification).....	4 10 0	5 0 0
Seconds.....	4 5 0	4 10 0
Small timber (6 in. to 10 in.).....	3 15 6	3 15 0
Small timber (6 in. to 8 in.).....	3 0 0	3 10 0
Swedish balks.....	2 15 0	3 0 0
Pitch-pine timber (30 ft. average).....	3 5 0	3 15 0

JOINERS' WOOD.

White Sea: first yellow deals, 3 in. by 11 in.....	23 0 0	24 0 0
3 in. by 9 in.....	21 0 0	22 10 0
Battens, 2 1/2 in. and 3 in. by 7 in.....	17 0 0	18 10 0
Second yellow deals, 3 in. by 11 in.....	18 10 0	20 0 0
3 in. by 9 in.....	17 10 0	19 0 0
Battens, 2 1/2 in. and 3 in. by 7 in.....	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.....	15 10 0	16 10 0
Battens, 2 1/2 in. and 3 in. by 7 in.....	11 10 0	12 10 0

Petersburg: first yellow deals, 3 in. by 11 in.....	21 0 0	22 10 0
Do. 3 in. by 9 in.....	18 0 0	19 10 0
Battens.....	13 10 0	15 0 0
Second yellow deals, 3 in. by 11 in. and 9 in.....	16 0 0	17 0 0
Do. 3 in. by 9 in.....	14 10 0	16 0 0
Battens.....	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.....	13 10 0	14 0 0
Do. 3 in. by 9 in.....	13 0 0	14 0 0
Battens.....	10 0 0	11 0 0

White Sea and Petersburg:— First white deals, 3 in. by 11 in. and 9 in.....	14 10 0	15 10 0
Second white deals, 3 in. by 11 in. and 9 in.....	13 10 0	14 10 0
Do. 3 in. by 9 in.....	12 10 0	13 10 0
Battens.....	9 10 0	10 10 0
Pitch-pine: deals.....	18 10 0	20 0 0
Under 2 in. thick extra.....	0 10 0	1 0 0
Yellow Pine—First, regular sizes.....	40 0 0	upwards.
Oddments.....	28 0 0	" "
Seconds, regular sizes.....	30 0 0	" "
Yellow Pine oddments.....	28 0 0	" "
Kauri Pine—Planks, per ft. cube.....	0 3 6	5 0

Danzig and Stettin Oak Logs— Large, per ft. cube.....	0 2 6	0 8 6
Small.....	0 2 0	0 8 0
Wainscot Oak Logs, per ft. cube.....	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as each.....	0 0 8	0 0 9
3 in. do. do.....	0 0 7	—

Dry Mahogany—Honduras, Ta- basco, per ft. super. as sup. as Selected, Figury, per ft. sup. as each.....	0 0 9	0 1 0
Do. do. do.....	0 1 6	0 2 6
Dry Walnut, American, per ft. sup. as each.....	0 0 10	0 1 0
Teak, per load.....	47 0 0	21 0 0
American Whitewood—Planks, per ft. cube.....	0 4 0	—

Prepared Flooring— 1 in. by 7 in. yellow, planed and shot.....	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched.....	0 14 0	0 18 0
1 1/2 in. by 7 in. yellow, planed and matched.....	0 16 0	0 1 0
1 in. by 7 in. white, planed and shot.....	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched.....	0 13 6	0 15 0
1 1/2 in. by 7 in. white, planed and matched.....	0 15 0	0 16 6
3 in. by 7 in. yellow, matched and beaded or V-jointed brds.....	0 11 0	0 13 6
1 in. by 7 in. do. do.....	0 14 0	0 18 0
3 in. by 7 in. white do. do.....	0 10 0	0 11 6
1 in. by 7 in. do. do.....	0 11 6	0 13 6
6 in. at 6d. to 9d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

Rolled Steel Joists, ordinary.....	2 s. d.	2 s. d.
Heavy Vans, per ton.....	5 15 0	6 15 0
Compound Girders, ordinary.....	7 12 6	8 15 0
Angles, Tees and Channels, ordi- nary sections.....	7 7 6	8 7 6
Flitch Plates.....	7 15 0	8 5 0
Cast Iron Columns and Stan- chions including ordinary pat- terns.....	6 12 6	7 15 0

METALS.

IRON— Common Bars.....	Per ton, in London.	2 s. d.
Staffordshire Crown Bars, good merchant quality.....	6 15 0	7 5 0
Staffordshire "Marked Bars".....	7 5 0	7 15 0
Mild Steel Bars.....	8 5 0	8 15 0
Hoop Iron, best quality.....	8 15 0	9 0 0
Galvanized.....	16 10 0	—
(And upwards, according to size and gauge.)		
Sheet Iron, Black— Ordinary sizes to 20 g.....	9 0 0	—
24 g.....	10 0 0	—
26 g.....	11 15 0	—
Sheet Iron, Galvanized, flat, ordinary quality— Ordinary sizes 6 ft. by 2 1/2 ft. to 3 ft. to 20 g.....	12 0 0	—
Ordinary sizes to 22 g. and 24 g.....	12 10 0	—
Sheet Iron, Galvanized, flat, best quality— Ordinary sizes to 20 g.....	15 0 0	—
22 g. and 24 g.....	15 10 0	—
Galvanized Corrugated Sheet— Ordinary sizes 6 ft. to 8 ft. 20 g.....	12 0 0	—
22 g. and 24 g.....	12 10 0	—
Best Soft Steel Sheets, 6 ft. by 2 ft. 11 0 0		—
to 3 ft. by 20 g. and thicker.....	11 0 0	—
Best Soft Steel Sheets, 22 g. & 24 g.....	13 0 0	—
26 g.....	13 5 0	—
Cut nails, 3 in. to 6 in.....	8 10 0	9 0 0
(Under 3 in., usual trade extras.)		

LEAD, &c.

LEAD—Sheet, English, 3 lb. and up to 15 lb. 10 0	Per ton, in London.	2 s. d.
Pipe in coils.....	18 0 0	—
Soil pipe.....	18 10 0	—
Compo pipe.....	18 10 0	—
Zinc—Sheet— Villed Montagne.....	30 15 0	—
Silesian.....	30 10 0	—
COPPER— Strong Sheet.....	per lb. 0 0 10	—
Thin.....	0 0 11	—
Copper nails.....	0 0 10	—
BRASS— Strong Sheet.....	0 0 94	—
Thin.....	0 0 10	—
Trs—English Ingots.....	0 1 4	—
Solders—Plumbers'.....	0 0 6d	—
Timmer.....	0 0 8	—
Blowpipe.....	0 0 9	—

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds.....	2d. per ft. delivered.	2 s. d.
" fourths.....	2d. " "	—
21 oz. thirds.....	3d. " "	—
" fourths.....	3d. " "	—
26 oz. thirds.....	4d. " "	—
" fourths.....	4d. " "	—
32 oz. thirds.....	5d. " "	—
" fourths.....	5d. " "	—
Printed Sheet, 15 oz.....	3d. " "	—
" 21 oz.....	4d. " "	—
Harley's Balled Plate.....	2d. " "	—
" " " " " " " "	2d. " "	—
" " " " " " " "	2d. " "	—

OILS, &c.

Raw Linseed Oil in pipes.....	per gallon	2 s. d.
" " " in barrels.....	0 1 5	—
" " " in drums.....	0 1 8	—
Bolled " " in barrels.....	0 1 7	—
" " " in drums.....	0 1 8	—
Turpentine, in barrels.....	0 1 10	—
" " " in drums.....	0 1 4	—
Genuine Ground English White Lead.....	per ton 19 15 0	—
Red Lead, Dry.....	19 5 0	—
Best Linseed Oil Putty.....	per cwt. 0 6 6	—
Stockholm Tar.....	per barrel 1 12 0	—

VARNISHES, &c.

Fine Pale Oak Varnish.....	Per gallon.	2 s. d.
Fine Copal Oak.....	0 8 0	—
Superfine Pale Elastic Oak.....	0 10 6	—
Fine Extra Hard Church Oak.....	0 12 6	—
Superfine Hard-drying Oak, for seats or Churches.....	0 14 0	—
Fine Elastic Carriage.....	0 12 6	—
Superfine Pale Elastic Carriage.....	0 16 0	—
Fine Pale Maple.....	0 16 0	—
Finest Pale Durable Copal.....	0 18 0	—
Extra Pale French Oil.....	1 1 0	—
Eggshell Flattening Varnish.....	0 18 0	—
White Copal Enamel.....	1 4 0	—
Extra Pale Paper.....	0 12 0	—
Best Japan Gold Size.....	0 10 6	—
Best Black Japan.....	0 16 0	—
Oak and Mahogany Stain.....	0 9 0	—
Brunswick Black.....	0 8 6	—
Berlin Black.....	0 16 0	—
Knottling.....	0 10 0	—
French and Brush Polish.....	0 10 0	—

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECTOR from the Office to residents in any part of the United Kingdom at the rate of 12s. per annum (22 numbers) PREPAID. To all parts of America, Australia, New Zealand, India, China, Ceylon, etc., 26s. per annum. Remittances (payable to J. MOYAN) should be addressed to the Publisher of "THE BUILDER," Catherine-street, W.C.

SUBSCRIBERS IN LONDON AND THE SUBURBS, by prepaying at the Publishing Office 12s. per annum (22 numbers) or 4s. 8d. per quarter (13 numbers), can ensure receiving "The Builder" by Friday Morning's Post.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursdays. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100L, unless in some exceptional cases and for special reasons.]

* Denotes accepted. † Denotes provisionally accepted.

ACTON (Middlesex).—For factory and engine shed, for Messrs. Walter Turnbull & Co. Mr. John T. Hart, architect, Bedford-row, W.C. Quantities by Mr. W. G. C. Jones..... 27,298 Moore & Page..... 28,950 Winter..... 7,249 Penney & Co..... 6,830 G. Bentley & Co..... 7,150 Knight..... 6,780 Shepherd..... 6,999 Saunders..... 6,729 Pratt..... 6,975

BEMBRIDGE.—For excavating, etc., for and laying 913 yds. of 4-in. and 3,030 yds. of 3-in. pipes, etc., for the Isle of Wight Rural District Council. Mr. H. B. Cullin, Surveyor, Brooklands, Wootton, Isle of Wight.—E. Smith & Co., Bristol..... 2,489 0 11 Streeter & Co., Freshwater, Isle of Wight..... 473 3 10 † Subject to approval of bondsmen and references.

BEMBRIDGE.—For 980 yds. of 4-in. cast-iron socket pipes and 3,173 yds. of 3-in. cast-iron socket pipes, for the Isle of Wight Rural District Council. Mr. H. B. Cullin, Surveyor, Brooklands, Wootton, Isle of Wight.—Ormesby Ironworks, Co., Ltd., Middlesbrough-on-Tees..... 2,418

TENDERS—Continued on page 107.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered
*Free Public Library	Borough of Nelson	50l., 25l., 15l.	Mar. 4
*Designs for School.	Taunton Education Committee	See advertisement in this issue	Mar. 31

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Hartshill Stones and Chippings	Bicester R.D.C.	J. W. Trubb, Highway Surveyor, Fewcott, Bicester	Jan. 28
Painting, etc., at Children's Homes	Sheffield Guardians	Superintendent of the Homes, Smelter-lane, Pitsmoor, Sheffield	do.
Drainage Works at Dagenham	Romford R.D.C.	J. Simmons, Engineer, Bank-chambers, Doncaster	do.
Street Works	Walsend Corporation	F. Hollings, Borough Surveyor's Office, Hugh-street, Walsend	Jan. 30
Private Improvement Works	Halifax Highways Committee	J. Lord, Borough Engineer, Town Hall, Halifax	do.
Cleaning, Painting, Varnishing, etc. Sunday Schools	Idle Primitive Methodists	At the School.	do.
Outside Painting of Museum Buildings, High-street	Ipswich Museum and Library Com.	F. Wainough, Secretary, Museum-buildings, High-street, Ipswich	do.
Renewal of Western Return End of E. India Wharf	Greenock Harbour Trust	R. Crawford, C.E., Engineer to Trustees, Greenock	do.
Materials for Longford Depot	Warrington Sanitary Works Com.	Manager, Longford Depot	do.
1,140 tons of Portland Cement	Stockport Corporation	J. Atkinson, Borough Surveyor, Stockport	do.
580 tons of Limestone Chippings	do.	do.	do.
4,500 tons of Broken Limestone	do.	do.	do.
230 tons of Cressote Oil	do.	do.	do.
One Wadsworth's Tumbler Cart	Warrington Paving, etc., Committee	T. Longdin, Borough Engineer, Town Hall, Warrington	do.
Two Hand-road Scraping Machines	C. H. Taylor & Son	Howdill & Howdill, Architects, Oxford-row, Leeds	do.
Iron Boundary	New Shoreham U.D.C.	A. W. Nye, Town Surveyor, New Shoreham	do.
Redecoration of Town Hall (part)	Salford Corporation	Borough Engineer, Town Hall, Salford	Jan. 31
Sewering, Paving, etc. Swinton Park-rd., Pendleton	Rev. J. Standford	F. E. Cleverdon, 4, Buckland-terrace, Plymouth	do.
Materials for Cleansing Department	Tavistock Lighting, Coal & Coke Co.	A. Francis, Secretary, Gasworks, Tavistock	do.
Erecting Buildings on New Site	Tunbridge Wells Borough Council	W. H. Maxwell, Borough Surveyor, Tunbridge Wells	do.
Roadworks, Culverden Down-road	Lanchester R.D.C.	J. R. Lupton, Surveyor, Lanchester	do.
Sewage Disposal Works near Crayhead	Fallsworth U.D.C.	G. Hunt & Son, Architects, Blandford	do.
Completion of a Street at Skircoat, Halifax	Markets and Tolls Committee	G. F. Gray, Surveyor, Council Offices, Fallsworth	do.
Engineering Bricks, Portland Cement, Sand, etc.	Belfast Guardians	Rev. G. Dalrymple, Ham Vicarage	do.
Lafrites at Ilam Schools	Slough U.D.C.	J. W. Robb, Clerk, Union Workhouse, Belfast	do.
Small Alterations at Markets, Stafford	Sheerness U.D.C.	Surveyor, 1, Mackenzie-street, Slough	do.
Cooking Apparatus at Union Workhouse	Eastleigh & Bishopstoke U.D.C.	T. E. Berry, Surveyor, Council Offices, Trinity-road, Sheerness	do.
Making-up Stoke Gardens	Hull Corporation	W. Wallace Gandy, Surveyor to Council, Eastleigh, Hants	do.
Paving Setts	King's Lynn Corporation	J. H. Hirst, City Architect, Town Hall, Hull	Feb. 1
Class Room, etc., Blandford	Plymouth St. Mary B.D.C.	H. J. Weaver, Borough Surveyor, Town Hall, King's Lynn	do.
200 tons of Macadam	Stockport Corporation	J. W. Thompson, Manager, Town Hall, Burnolswick	do.
Painting Branch Police Stations	Southampton Harbour Board	A. J. H. Carter, Borough Electrical Engineer, Milgate, Stockport	do.
Private St. Impres, North End & Diamond-st. Estate	Waltham Holy Cross U.D.C.	E. Cooper Poole, Engr., Harbour Office, Town Quay, Southampton	do.
Ten Complete Fender Pillarboxes with Bases	do.	W. F. Streather, Surveyor, Town Hall, Waltham Abbey	do.
Builder's Materials	do.	E. D. Jamison, Bank of Scotland Buildings, Elgin	do.
200 yds. Drainage, Up. Ringum Farm, Wester Elchies	do.	E. Parkes, Town Clerk, Town Hall, Eccles	do.
An Annex to Sewage Works Machinery Buildings	do.	T. H. Crampton, Clerk, Craubrook	do.
Corrugated Iron Laundry, etc., at Hospi, Swattenden	do.	W. H. Thompson, Manager, Town Hall, Burnolswick	do.
Coal Store	do.	D. Ross, Surveyor, Brechin-road, Kirdemuir	do.
Road Works	do.	H. C. Johnson, Clerk, Sessions House, Boston	do.
Road Materials, Boston, Lincs.	do.	W. W. Woodward, Engineer, Gas Offices, Bloom-street, Salford	Feb. 2
Firebricks, Retorts, etc.	do.	City Engineer's Office, Municipal Buildings, Leeds	do.
Paving and Flagging Works	do.	B. Biggins, Sanitary Inspector, Blaydon-on-Tyne	do.
Saveoing	do.	J. Cawley, Architect, Bull Ring, Northwich	do.
Lighting Hospital Buildings, etc. Leftwich	do.	Borough Engineer, 346, Kennington-road, S.E.	do.
Roads, Fencing, and Laying Drains and Water Pipes	do.	Borough Engineer, Town Hall, Hampstead	do.
Laundry Filtrage, Deterfector, and Steam Boiler	do.	E. H. Clark, Stores Superintendent, Gateshead	Feb. 3
Painting Works, Public Baths, Kennington-road	do.	E. W. Dixon, Engineer, 14, Albert-street, Harrogate	do.
*Erection of Buildings, etc.	do.	H. Bruce, C.E., Cipar	do.
Cartage	do.	O. M. Frouse, Engineer, Town Hall, Ilfracombe	do.
Cast-Iron Spigot and Socket Pipes	do.	Gustard & Waddington, Tredgar-chbrs., Bridge-st., Newport, Mon.	Feb. 6
Road Reconstruction, Ballyfoolan	do.	J. Atkinson, Borough Surveyor, Stockport	do.
Main Sewers	do.	Borough Surveyor's Office, Town Hall, Dewsbury	do.
75 tons Best Soft Blue Pig Lead	do.	H. Prescott, Man. of Hse. Drainage Dept., Town Hall, M'chester	do.
Seven 24-in. Vertical Sluice Valves	do.	Town Hall, Spa-road, S.E.	do.
3,714 tons of Cast-Iron Pipes	do.	W. H. Hargreaves, 8, Hytham-street, Darford	do.
50 tons of Special Castings	do.	Boro' Surveyor's Department, Town Hall, Aldershot	do.
*Building of Show-yard	do.	Council's Surveyor, Beckenham	do.
200,000 gallons of Cressote Oil	do.	Borough Engineer, Town Hall, Paneras-road, N.W.	do.
Borehole, 240 ft. deep (Roundhills Tunnel)	do.	W. Hargreaves, Engineer, Hytham-street, Darford	do.
Auchtermuchty Waterworks	do.	Borough Surveyor, Town Hall, Faddington	do.
Cast-Iron Water Main	do.	Isaac Carr, Engineer, Widnes	Feb. 7
Re-building the Ancient Druid Inn, Hollybush, Mon.	do.	E. G. Mawbey, Borough Engineer, Town Hall, Leicester	do.
Paving & Flagging Dickinson st. & Tunnel-lane	do.	J. Pearson, District Surveyor, Lutterworth	do.
Horse Drainage Works	do.	E. G. Henton, Architect, 22, Cardiff-street, Aberdeen	do.
Ventilating Grigs and Other Castings	do.	H. Walter, Barcombe, Lewes	Feb. 8
Annual Contracts	do.	Board's Offices, Tyburn, near Birmingham	do.
Making-up Private Streets	do.	C. Brownridge, Borough Engineer, Town Hall, Birkenhead	do.
Supplies	do.	do.	do.
*Drainage Works	do.	A. B. McDonald, City Engineer, 64, Cochrane-street, Glasgow	do.
Annual Contracts	do.	W. M. Wilkins, Town Clerk, Town Hall, Battersea	do.
Making-up Roads	do.	W. H. Hargreaves, Engineer, Town Hall, Aldersbury	do.
*Supply of Aberdeen Granite Setts	do.	Office of Board, Embankment, E.C.	do.
Two Boreholes	do.	Borough Engineer, Maxey-road, Plumstead	Feb. 9
Painting Exterior of Asylum Extension	do.	A. E. White, City Engineer, Town Hall, Hull	do.
Granite Supply	do.	E. R. Stephenson, Engineer, Town Hall, Llandudno	do.
Drawing Granite	do.	do.	do.
Thirty-five Houses at Bargoed	do.	do.	do.
Flints, Aylesbury	do.	do.	do.
Branch Sewer in Western-road, Newick	do.	do.	do.
Stores and Materials	do.	do.	do.
Road Materials	do.	do.	do.
Stores	do.	do.	do.
Team Labour, etc.	do.	do.	do.
Baths and Washhouses at Parkhead	do.	do.	do.
Annual Contracts	do.	do.	do.
*New Sashes to Windows, Leazesden Asylum	do.	do.	do.
Annual Contracts	do.	do.	do.
Full Corporation	do.	do.	do.
2,500 tons of Granite Setts	do.	do.	do.
Roadmaking, etc. Gloddath-street	do.	do.	do.

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered
Cemetery at Ballyclare	Antrim R.D.C.	J. A. Hanna, C.E., 102, Donegal-street, Belfast	Feb. 9
Building a Gate Lodge at Cemetery	do.	do.	do.
Stores	Chiswick U.D.C.	J. Barclay, Surveyor, Town Hall, Chiswick	do.
*Annual Contracts	C.B. of West Ham	Borough Engineer's Office, Town Hall, Stratford, E.	do.
*Sewerage Disposal and Refuse Destructor Works	Twickenham U.D.C.	Council's Surveyor, Town Hall, Twickenham	do.
Stores	Stockton-on-Tees Corporation	Borough Engineer, Town Hall, Stockton-on-Tees	Feb. 10
School-rooms, Class-rooms, etc., Wes. Chapel, Hesseford	Belfast and County Down Railway	T. J. Brittain, Secretary, Queen's Quay Terminus, Belfast	do.
Materials	Warrington Water Committee	W. Matthews, Hesseford, near St. Germans	Feb. 11
150,000 Jarrah or Kari Wood Paving Blocks	Bradford Corporation	J. H. Cox, City Surveyor, Town Hall, Bradford	do.
Materials, Foundations, etc., for Hospital, Calleywood	Blackburn Corporation	W. Stubbs, Borough Engineer, Municipal Offices, Blackburn	do.
Boys' School	Chelmsford Joint Hospital Board	A. S. Duffield, 98, High-street, Chelmsford	do.
Stores	Mountain Ash Education Committee	W. G. Thomas, Architect, Public Offices, Mountain Ash	do.
School and Alterations to Buildings, Beamister	River Weaver Trustees	J. A. Sauer, Engineer, Weaver Navigation, Northwich	Feb. 13
Materials	Grammar School Governors	R. Leigh, Clerk to Governors, Beamister	do.
*Generating Station at South Kensington	Urmston U.D.C.	A. W. Bradley, Borough Engineer, Municipal Offices, Bury	Feb. 14
13,350 yds. of 4-in. Mains, North Sunderland	Bury Sewerage, etc., Committee	S.S. Mossop, Clerk, Long Sutton, Lincolnshire	do.
1,249 yds. of 2-in. Mains, North Sunderland	H.M. Office Commissioners	H.M. Office of Works, Storey's-gate, S.W.	do.
454 yds. of 2-in. Mains, North Sunderland	Trustees of Lord Greve's Charity	Offices of Trustees, Clayton-chmrs., 61, Westgate-rd., Newc-on-T.	Feb. 15
Reservoir to hold 30,000 gallons, Ellingham	do.	Anson & Shenton, Engrs., 28, Victoria-st., Westminster, London	do.
Reservoir to hold 60,000 gallons, Seahouses	do.	do.	do.
Annual Contracts	Folkestone Corporation	A. E. Nichols, Borough Engineer, Corporation Offices, Folkestone	do.
*Works, Materials, and Services (One or Three Years)	Hampstead Borough Council	Borough Engineer, Town Hall, Haverstock Hill, N.W.	do.
*Additions, etc., Ladywell Workhouse, S.E.	Bernardsey Guardians	Guardians' Offices, Tooley-street, S.E.	Feb. 16
Roadworks, Pinewood-av., Oak-gr., Stephen-st., etc.	Urmston U.D.C.	J. Heath, Surveyor, Council Offices, Urmston	Feb. 17
Materials and Handling	St. Thomas R.D.C.	J. Bray, Surveyor, Alington	Feb. 18
Cast-iron Pipes (Water Scheme, Contract No. 1)	Chapel-en-le-Frith R.D.C.	Swann & Brady, Engineers, Town Hall, Chapel-en-le-Frith	do.
Waterworks and Materials (Contract No. 2)	do.	do.	do.
*Makings-up Streets	Wanstead U.D.C.	Council's Surveyor, Council's Offices, Wanstead, N.E.	Feb. 22
*Additional Buildings at Hospital, near Dartford	Metropolitan Asylums Board	Office of Board, Embankment, E.C.	do.
Enlargement Oulton Council School Bldgs., Lowestoft	East Suffolk Education Committee	F. W. Richards, Architect, 14, Stanley-street, Lowestoft	Mar. 17
Pulling down Cottages, Queen-street, Lynn	Ley's Malleson & Co., Ltd.	H. T. Tibson, Architect, Railway-road, King's Lynn	No date.
Alms, etc., at Thyrbergh Temporary Provided School House at Greenhill, Ystrad Rhondda	West Riding Education Committee	J. E. Ridgway, Architect, Long Sutton, Lincolnshire	do.
Demolishing Property on site of new Cotton Exchange	E. Liowelwyn	J. Vickers-Edwards, County Architect, County Hall, Wakefield	do.
£10,000 Bunker, etc., for Steam Hooper Barge	Hartlepool Port and Harbour Com.	Sunny Cottage, Ystrad Rhondda	do.
Concrete Foundations & Brick Superstructure, W. Tanks	Shrewsbury Corporation	Matear & Simon, Archts., Century-buildings, N. John-st., Liverpool	do.
500,000 Bricks, Teams Siding, Dunston	H. Stobart & Co., Ltd.	J. D. Hawkins, Engineer, Town Hall, Hartlepool	do.
Fifty Houses at Chilton Colliery	do.	C. M. Johnston, Borough Electricity Works, Roushill, Shrewsbury	do.
Infants' School, Buxton	Fairfield Endowed School Trustees	Sallow Bros., Builders, Dunston	do.
*Nurses' Home at Workhouse, Bromley-by-Bow	Stepney Guardians	Colliery Offices, Etherley	do.
*New Buildings and Extensions to Workhouse, Redhill	Reigate Guardians	J. E. Adlington, Architect, High-avenue, Sutton-in-Ashfield	do.
		W. B. Bryden, F.R.I.B.A., George-street, Buxton	do.
		Clerk, Offices, Barnes-street, Commercial-road East, E.	do.
		E. Penfold, Architect, High-street, Reigate	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Quantity Surveyor	Hackney Borough Council	Not stated	Feb. 2
*Clerk of Works	Durham C.C.	37. per week	Feb. 4
*Building Inspector	Hendon U.D.C.	2007. per annum	Feb. 6
*Inspector of Nuisances	do.	2007. per annum	do.
*Road Foreman	do.	22. 10s. per week	do.
*Assistant Borough Surveyor	Taunton Town Council	1504.	Feb. 13

Those marked with an (*) are advertised in this number.

Competitions, iv.

Contracts, iv. vi. viii. x.

Public Appointments, xvii.

TENDERS.—Continued from page 105.

REMBRIDGE.—For 727 yds. of 9-in. earthenware glazed socketed pipes, for the Isle of Wight Rural District Council. Mr. H. B. Cullin, Surveyor, Brooklands, Wootton, Isle of Wight.

G. Arthur, Newport, Isle of Wight £252 6 2

BEXLEY HEATH (Kent).—For sewer works (Christ-church part, Contract 6), for the Bexley Urban District Council. Mr. W. J. Lomas, engineer, 11, Fold-street, Bolton.

S. Kavanagh & Co., Surbiton Hill* £489

BIRNIE (N.B.).—For 570 yds. of approaches to the new bridge across the River Lousie, near Hillhead, Birnie, for the County Council of Elgin. Mr. Alexander Hogg, County Road Surveyor, Elgin. Quantities by Surveyor.

Approaches.

A. Nicholson .. £398 9 2 J. Gordon .. £219 17 1
J. Newlands .. 271 7 8 A. Falconer,
J. Milne & Son .. 217 19 7 Elgin* .. 216 3 5
T. McLean .. 221 14 9

Iron and Steel Work.

Redpath, Brown, & Co., Ltd. .. £195 0 0
P. & W. Macellan & Co., Ltd. .. 190 6 10
W. McIlmarn & Co. .. 178 15 0
J. Abernethy & Co., Aberdeen* .. 159 15 0

BOGNOR.—For the erection of a pair of villas, Marine-para, Bognor, for Mr. C. R. Cross. Mr. E. E. Hoger, architect, 35, Backwater, E.C. —

L. Harris, London* £4,805

CARLISLE.—For new drainage at Fussell Work-house, for the Guardians. Mr. G. Armstrong, architect and surveyor, 24, Bank-street, Carlisle.

D. Thomson .. £208 14 8 T. Laing & Son £418 0 0
T. & R. B. .. 208 14 8 G. Hill & Son 409 0 0
J. Bealy .. 428 7 0 Logan, Car* .. 387 7 5
W. B. W. .. 420 0 8

CRICKLADE.—For 4,000 yds. of 4-in. and 2,900 yds. of 3-in. cast-iron water mains, etc., for the Cricklade and Wootton Bassett Rural District Council. Mr. F. Redman, engineer, 34, Wood-street, Swindon.

W. B. Winchcombe, Wroughton, Swindon £2,748 3

DOVER.—For 11 miles of double-line light railway to the river, for the Town Council.

With Chalk and With Beach
Clinker Ballast.

R. & G. Brislcy .. £13,460 0 0 .. £13,690 0 0
S. Pearson & Co. .. 14,570 16 5 .. 14,570 16 5
G. Holloway .. 12,989 6 8 .. 13,185 0 0
R. Woods & Co. .. 12,502 10 0 ..
G. Wimpey & Co. .. 13,530 14 5 .. 13,388 0 0

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G. C. Starkey .. 13,193 12 10 .. 13,157 19 10
T. Law .. 12,994 0 0 .. 13,229 0 0
G. Trenham .. 14,880 0 0 .. 15,000 0 0

R. W. Blackwell & Co. .. 13,064 6 6 .. 13,184 6 6
T. L. Scott & Co. .. 12,120 6 7 ..
Dick, Kerr, & Co., Ltd. .. 12,823 4 0 .. 13,093 4 0
Fry Bros. .. 14,467 7 7 ..

EPPING (Essex).—For additions to the Administrative block of the Isolation Hospital at Road-street, near Epping, for the Rural District Council. Mr. Horace White, architect, Loughton, Essex.

T. Keen .. £260 11 6 J. Whiffin & Son £189 0 0
R. Warriner .. 251 0 0 P. Wood & Sons, Epping* .. 159 18 0
Palmer Bros. .. 245 0 0
C. T. Frost & Son .. 238 0 0

EXETER.—For erecting shops and dwellings at 29 and 30, Bridge-street, for Mr. Troke. Mr. R. M. Challice, architect and surveyor, 14, Bedford-circus, Exeter.

Ham & Rasmore .. £2,062 Westcott, Austin, & Spaul .. 2,062 White, Exeter* .. £1,740
W. G. Coles .. 1,996 G. Setter .. 1,700
C. Heath .. 1,698

HELSTON.—For erecting a secondary school, Penrose-road, for Cornwall Education Committee. Mr. W. J. Winn, architect, Helston.

Richards & Frezise .. £1,410
W. J. Winn, Helston* .. 1,275

KIDDERMINSTER.—For erection of engine-house, boiler-house, and chimney-stack, etc. (Water Supply, Contract No. 3), for the Corporation. Messrs. Wilcox & Raikes, engineers, 63, Temple-road, Birmingham.

Neal Ltd. £12,813 0 0 G. Law .. 10,165 0 0
W. Willetts .. 11,979 0 0 Sons .. 9,950 0 0
J. Jackson .. 11,560 0 0 G. Griffiths .. 8,860 0 0
A. B. & M. J. .. 11,514 16 2 G. E. Jack-son .. 9,548 0 0
The .. 11,514 16 2
J. Gneat & Son .. 11,500 0 0 & Sons .. 9,400 0 0
J. Meredith .. 10,930 0 0 T. Vale .. 9,295 0 0
M. Warrington .. 10,723 8 8 Sons, Stourport* .. 9,172 0 0
C. A. Horton .. 10,688 0 0 E. Dorset .. 9,172 0 0

LEIGH-ON-SEA.—For extension of engine-house at the waterworks, Canvey-road, for the Urban District Council. Mr. W. J. Petch, surveyor.

A. & H. Holding £371 10 9 F. J. Green .. £311 15 0
R. Elvey .. 348 13 6 H. E. Johnson .. 306 4 8
A. J. Davidson .. 336 5 9 J. J. Yaler .. 298 4 0
A. J. Golding .. 333 15 5 Leigh-on-Sea* .. 298 4 0
J. H. Matthews & Son .. 325 10 2 F. & E. Davey, Ltd. .. 295 0 0

LONDON.—For erecting an engineer's cottage at the North-Eastern Fever Hospital, St. Anne's-road, Tottenham, N., for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief.

F. W. Harris & Co., Ltd. .. £290 0 0 G. Wilby, Blackstock Works, Aldridge & Son .. 671 0 0
J. J. Richards .. 680 0 0 Blackstock-Smith & Barber .. 637 18 7
W. Dudley .. 628 0 0 Parks, N.* .. 510 0 0
S. Kind .. 625 0 0

LONDON.—For erecting an engineer's cottage at the North-Western Fever Hospital, Lawn-road, Hampstead, N.W., for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief.

J. J. Richards £250 0 0 T. Cole .. £253 0 0
F. W. Harris & Co., Ltd. .. 667 0 0 stock Works, Aldridge & Son .. 667 0 0
J. J. Richards .. 661 10 3 road, N.* .. 570 0 0
F. G. Taylor .. 598 0 0

The Engineer-in-Chief's revised estimate was £550.

LONDON.—For making-up roadway and paving footways of Hugon-road (Section 2), for the Fulham Borough Council. Mr. Francis Wood, Borough Engineer, Town Hall, Fulham, S.W.:

Roadway.
B. Nowell & Co. £271 0 0 G. Wimpey & Co. £225 0 0
L. Sommerfeld 240 16 6 H. J. Greenham 219 0 0

Footways.
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S. J. Wray & Sons 65 0 0 Atlas Stone Co. 45 13 6
Tenders: 65 0 0
Imperial stone. * Clinker flags. * 2½-in. Atlas stone (no deposit). * 2-in. Atlas stone (no deposit).

LONDON.—For forming and laying a new road to the Medical Superintendent's house and removing wall at North-West Fever Hospital, Hamstead, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief:—

T. C. Starkey. £282 4 10 Grounds & Newton 145 0 0
F. Fowles 220 0 0 G. Bell 141 0 0
H. Woodham & Sons 200 0 0 C. W. Killingback & Co. 139 0 0
S. Kavanagh & Co. 168 0 0 J. C. Trueman, Oaklands, 178 0 0
R. Ballard, Ltd. 176 0 0 S. W. Bailey, 169 0 0
T. Adams 168 0 0 Junction* 130 0 0
R. E. Mayo 165 0 0

LONDON.—For sanitary work and decoration to 44, Gloucester-road, Finsbury Park, for Mr. A. Heathorn.—
G. Robinson, Andover Works, Andover-road* £150

LONDON.—For the erection of the temporary and seven required for the portion of the Greenwich electricity generating station, for the London County Council:—
Humphreys, Ltd. £2,441 2 5 J. McManus £1,875 18 0
H. Loyatt, Ltd. 1,870 14 9 London* 1,437 0 0

MERTON.—For erection of office and cart, tool, and steam-roller sheds, Kingston-road, for the Croydon Rural District Council. Mr. R. M. Chart, F.S.I., Union Bank-chambers, Croydon:—
W. Roberts, Bennett-road, Croydon* £210 5 6

NEWLYN (Cornwall).—For erecting four dwelling-houses at Church-street, for Mr. Brighton. Mr. H. Madden, architect, 13, Clarence-street, Penzance:—

J. Nicholas. £754 9 Hosking & Lavers 2705 0
W. Grenfell 716 18
Masonry Only.
J. Nicholas. £530 9 R. Hosking, Hes- 2421 0
C. Tregenza 510 0 Moor, Penzance*
Carpentry Only.
R. Walters. £275 14 J. Bodinnar 2224 0
J. Berryman 248 3 W. Greenall 206 18
J. Rowe 226 0 Moushole*
ROXBURGH and DISTRICT (Board of Lunacy).—For erecting a wing for female patients at the Asylum, Meiros, for Roxburgh District Board of Lunacy. Messrs. Sydney Mitchell & Wilson, architects, 13, Young-street, Edinburgh:—

A. McKie. W. Scott. £7,502 0 0
R. Hall & Co. £8,595 0 7½ H. T. & R. Montgomery 7,428 10 0
J. Adam & Co. 8,111 0 0 Neil, McLeod, & Sons 7,303 0 0
A. Herbertson & Son 8,000 0 0 J. & E. Forrest 7,176 0 0
J. Sniers 7,985 4 0 Scott & Brown 7,058 14 0
A. Inglis & Sons 7,710 0 0 A. Calder, 13, Barclay place, Edinburgh* 7,050 0 0
W. Linton. 7,674 8 3
A. Scott & Sons 7,595 0 0

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S. Danton 385 0 J. Cronk 300 0
W. Wignmore 388 10

SHINCLIFFE (Durham).—For sewerage works, for the Durham Rural District Council. Mr. G. Gregson, Surveyor, 38, Saddler-street, Durham:—
J. Thompson. £382 16 9 R. Oliver 2295 0 0
W. Proudlock & Co. 301 15 4 J. Carrick, The Peth, Durham* 288 9 9
J. G. Bradley. 298 10 0

SOUTHAMPTON.—For erecting ten cottages on the area north of Simnel-street, for the Corporation. Mr. C. J. Hair, architect, 23, Portland-street, Southampton:—

H. Stevens & Co. £2,631 0 F. Osman 2,457 10
L. J. Richards. 2,620 0 Exors. of W. 2,393 0
H. J. Hood 2,508 15 Franklin 2,290 0
T. H. Stiles 2,470 0 Golding & Ainsell 2,232 0
Jenkins & Sons, Ltd. 2,466 0 J. Nichol, Southampton* 2,232 0

STRABANE (Ireland).—For extension of sewers at the Workhouse, for the Guardians. Mr. W. Stuart, R.E., Stuart:—
G. Anderson, Meeting House-street, Strabane £175

STRATFORD-ON-AVON.—For alterations and repairs to property in Henley-street, for the Trustees of Shakespeare's Birthplace. Mr. E. G. Holton, architect, 58, Henley-street, Stratford-on-Avon:—
G. Huston. £489 8 6 E. T. Kennard, J. Harris & Son 488 0 0 Stratford-on-Avon* 2430 10 0
J. Ward & Co. 474 9 0

STROUD.—For water pipes (600 and 700 yds. of cast-iron socket-jointed pipes), for the Urban District Council. Mr. G. P. Milnes, Engineer, Town Hall, Stroud:—

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W. H. Dyer. £223 0 M. Clemens 1670 0
J. Colwin 179 0 H. Tippet* 185 10

WALLINGTON (Surrey).—For erecting a cottage and sheds at Stores Depot, Bute-road, for the Croydon Rural District Council. Mr. R. M. Chart, F.S.I., Union Bank-chambers, Croydon:—
E. J. Burnand, Wallington* £1,390

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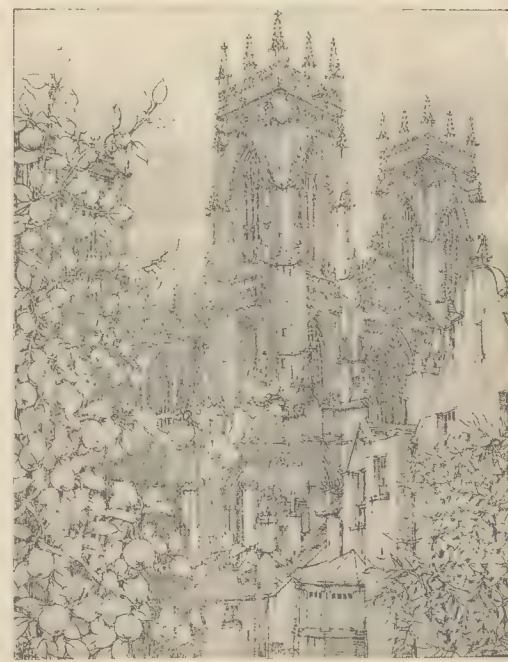
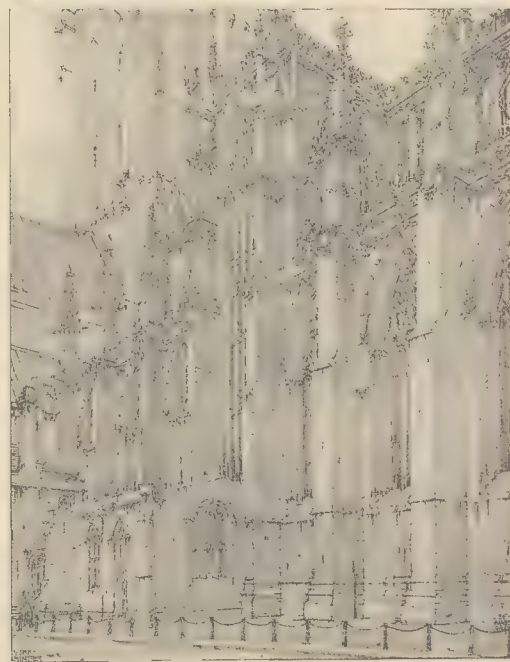
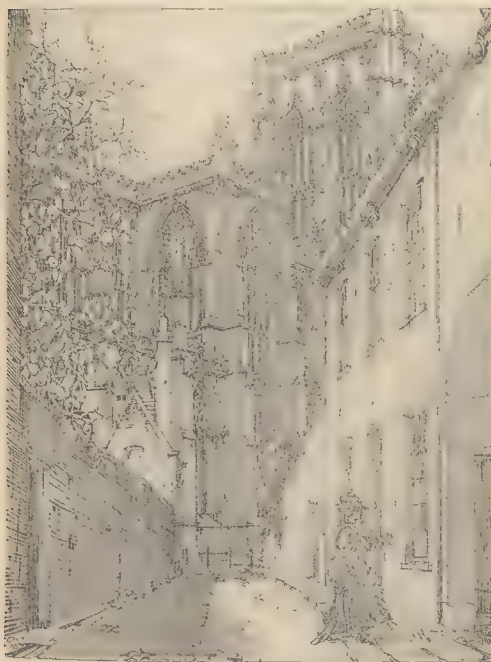
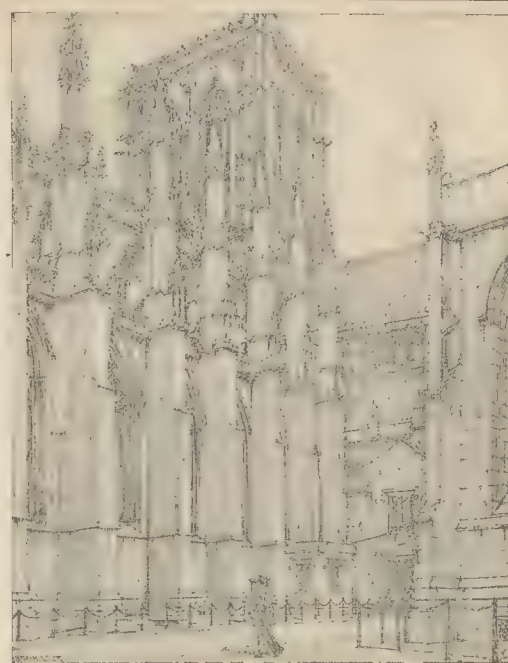
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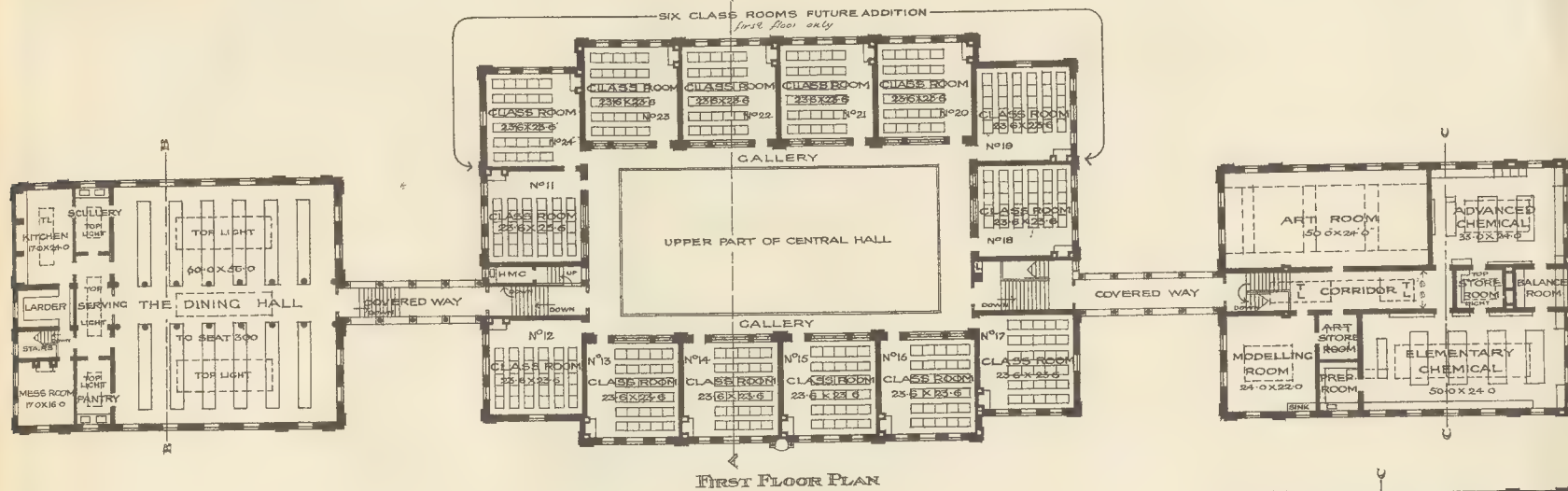
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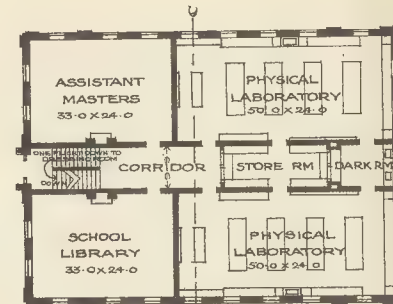
SKETCHES FROM ENGLISH CATHEDRALS.—By Mr. J. B. FULTON.



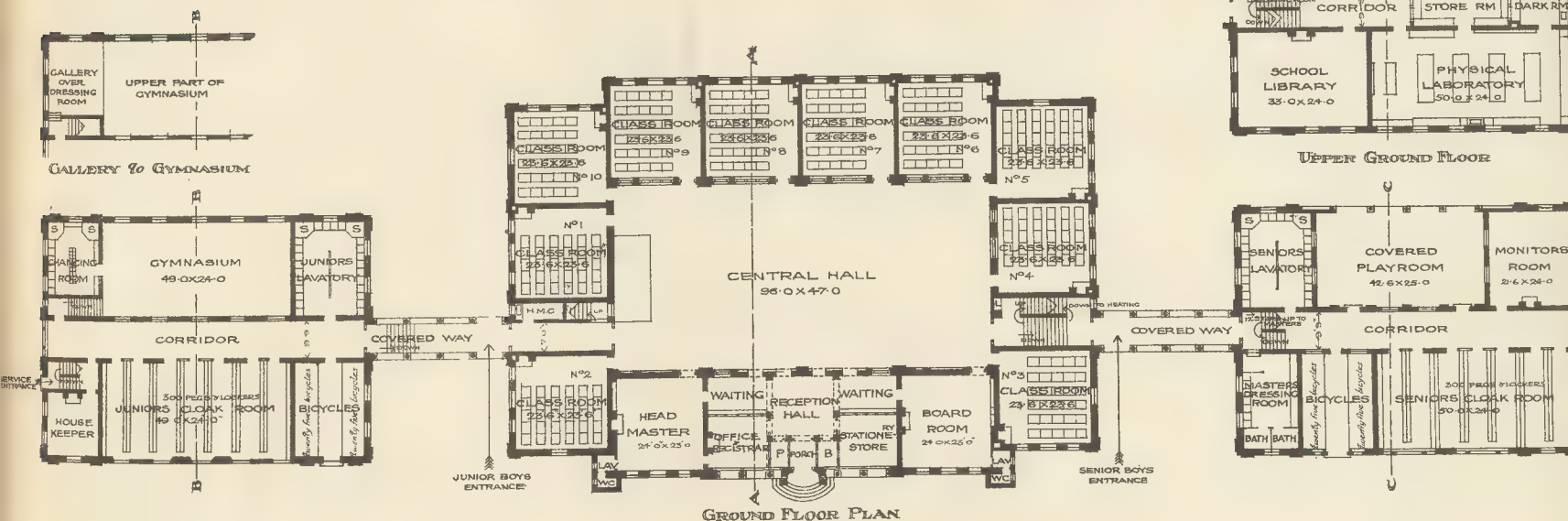
INTERIOR, YORK MINSTER.—DRAWN BY MR. J. J. LUTON



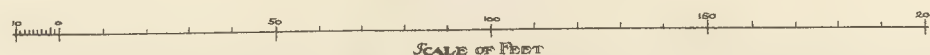
FIRST FLOOR PLAN



UPPER GROUND FLOOR



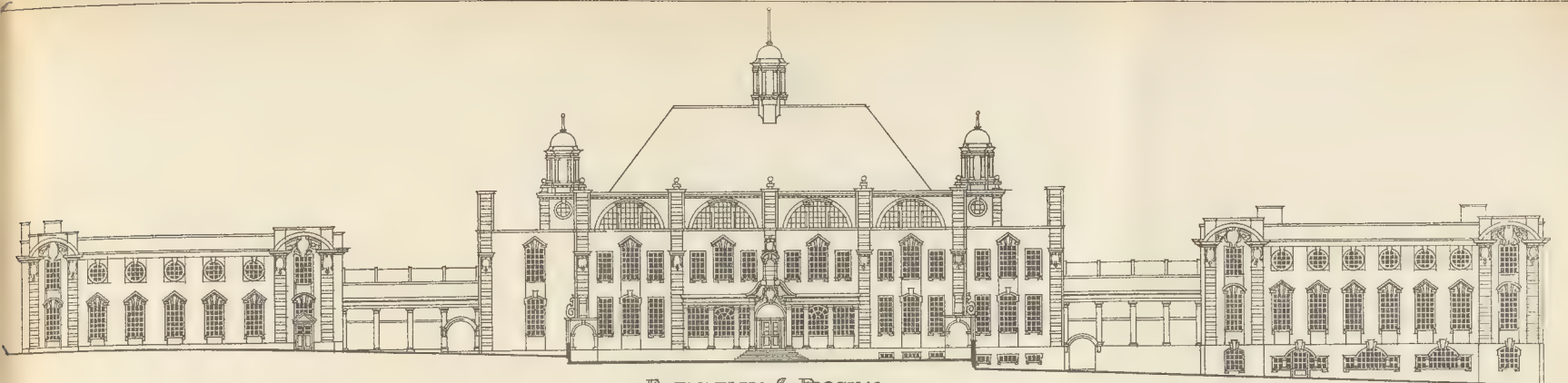
GROUND FLOOR PLAN



UNIVERSITY COLLEGE SCHOOLS, HAMPSTEAD: FIRST PREMIATED DESIGN.—By MR. ARNOLD MITCHELL, F.R.I.B.A.

PLANS.

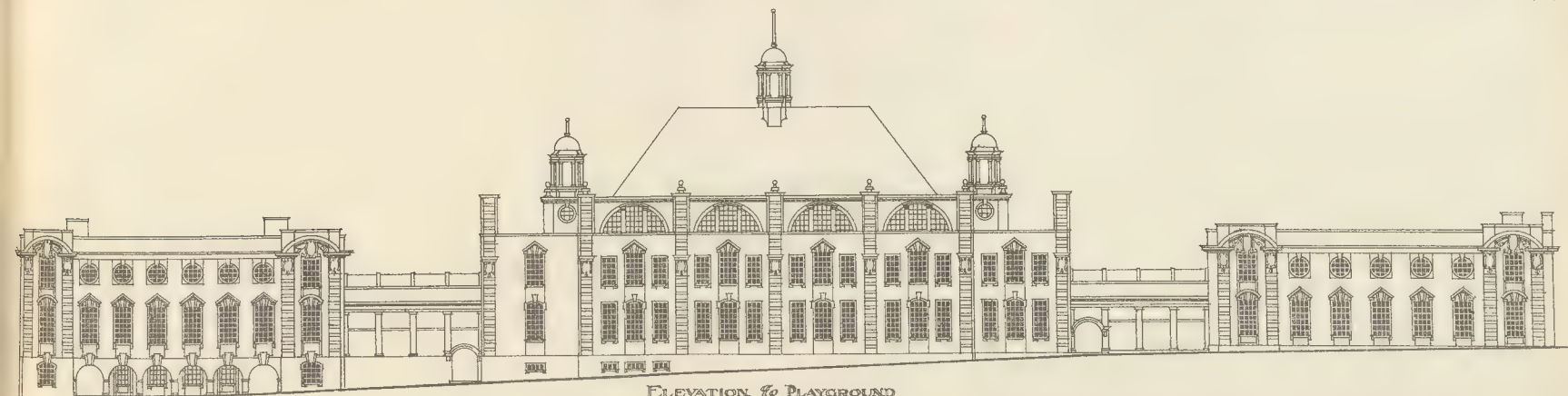
PHOTO - THE SPRINGWATER CANYON 445 EAST HARDING AVE. FETTER LANE, E



ELEVATION TO FRONT



LONGITUDINAL SECTION



ELEVATION TO PLAYGROUND

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200

UNIVERSITY COLLEGE SCHOOLS, HAMPSTEAD FIRST PREMIAED DESIGN - BY MR. ARNOLD MITCHELL F.R.I.B.A.

ELEVATIONS AND SECTION.

PHO D. 1" x 5" SCALE A.C. 1" x 4.5" EAST HARD A.C. STREET LETTER, LANE E.C.

The Builder.

VOL. LXXXVIII.—No. 3235.

FEBRUARY 4, 1905.

ILLUSTRATIONS.

West Front, Beverley Minster.....	Drawn by Mr. J. B. Fulton.
University College Schools, Hampstead.....	Mr. Arnold Mitchell, F.R.I.B.A., Architect.
Section of S. Irene, Constantinople.....	From a Drawing.
Metropolitan Asylums Board; Principal Entrance ..	Mr. E. T. Hall, F.R.I.B.A., Architect.
Wrought Iron Gates, Worsley Hall.....	Designed by Mr. F. F. Glennie.
Old Lead Spout heads, Bolton Hall.....	From Photographs.

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*Byzantine, Romanesque, and Gothic
Architecture.*



N Professor Lethaby's recently published volume on "Mediæval Art" is an attempt to make an attempt to deal in the space of a single volume with the whole subject of the art of the Middle Ages, p. 1350, i.e., from the arch to the eve of the Renaissance. The book is characterless of knowledge and which one expects His statements are recent publications of rs. It is a refreshing normal insularity of cl literature.

Nearly half the volume is devoted to the elucidation of the development of architecture and art in the six centuries from A.D. 300 to A.D. 900. Of these six centuries the first 250 years were in the east of Europe a period of great architectural and artistic achievement. Then it was that there arose, culminating in the days of the world's greatest builder, the Emperor Justinian, the famous Byzantine art, whose worthiest representative is still to be seen in S. Sophia. To the great Byzantine works of this period Professor Lethaby's introductory chapters are an admirable guide. In his previous work

on S. Sophia he had thoroughly familiarised himself with the architecture of the VIth century; his present volume brings his knowledge up to date, corrected and reinforced in the light of modern discussions.

In dealing with this or any other subject the first thing is to define one's terms. Allow a man to frame his own definitions of capital, wealth, rent, and the like, and he weaves a logical web of Political Economy from which there is no escape. So it is with the terms of archæology. Before we can deal with Byzantine work it is necessary to have it defined. What is it? We are told that "it is developed out of the Hellenistic art as Romanesque is generally supposed to have developed from Roman." That may be so, if in the term "art" we do not include architecture; or if we include only architectural detail, carved caps and friezes, and mouldings and the like, which only too many architects imagine to be architecture. But architecture proper is the planning of buildings and the putting up of buildings in such fashion that they will stand in spite of the thrusts of vaults and roofs. In this, the proper sense of the term, surely Byzantine architecture has singularly little to do with Hellenistic architecture. The details of S. Sophia, St. Mark, and the rest are, we grant, mainly Greek in origin. But architecture, as we have said, is not details. In all the essential parts of planning and construction what possible connexion can there be between S. Sophia and the Parthenon? In plan they are as

dissimilar as two buildings well can be ; one is of solid marble, the other of brick, tile, and concrete veneered with marble and mosaic ; one is trabeated, the other arcuated in construction ; one has wooden roofs, the other has domes, semi-domes, barrel vaults, groined vaults, with all the apparatus of abutment necessary to stop their thrusts. Can two buildings be less alike in essentials ? What matter though the acanthus is a *motif* in the capitals of both, and that both rejoice in bands of egg-and-tongue ornament ?

Professor Lethaby would rechristen Byzantine "Hellenesque." A more misleading epithet could hardly be invented. It is not to Athens, but to Rome that Byzantine architecture owes paternity. Take the plan, a very remarkable one, of S. Sophia itself. There is no need to go to the Greeks for it. Professor Lethaby reproduces a diagram of the Nymphæum, which goes by the name of the Temple of Minerva Medica, at Rome; it was built about A.D. 260 (see next page). This building had a central dome, abutment for which was provided by flanking it with two lower semi-domes. This is precisely the method of abutment at S. Sophia, and of the characteristic Byzantine churches. The chief factor of Byzantine building, as the author rightly observes, is domical vaulting, the domes or vaults being shells of brick-concrete, which are homogeneous with the walls; widespreading rather than high, and covered on the outside with lead. This concentric type of plan naturally resulted from the use of the dome; the parts around the middle

* "Mediæval Art." By W. R. Lethaby. London: Duckworth. 1904.

spaces being so disposed as to spread the weight of the central dome over a wide area, and gradually diminishing in height. Even earlier than the Temple of Minerva Medica is the Syrian church of Kus-en-Nueijis, described in the author's earlier book on S. Sophia as Roman work of the IInd century. Inside it has a dome on pendentives over a square area, counterpoised by four tunnel vaults. It is S. Sophia in miniature. It is illustrated in the "Eastern Palestine Memoirs" for 1889, page 132. With such Roman origins for S. Sophia, it seems perverse to style it either Neo-Hellenic or Mediaeval Greek with M. Bayet, or Hellenesque with Professor Lethaby. Professor Bury was nearer the mark in designating it "Romaic." It is nothing but Roman work, modified for the purposes of the Greek Church; only by Roman architecture is to be understood not the spurious semi-Greek architecture of the temple, introduced into Rome by *dilettanti* and *virtuosi*, patronised and fostered by such people as Cicero, but the genuine, indigenous Roman architecture of the IInd century in brick and concrete, not in stone, with its building processes conditioned by the almost exclusive employment of unskilled labour. These were the materials and processes that upreared the Pantheon in the IInd century, and these, developed, of course, and improved in the course of four intervening centuries, built S. Sophia. Byzantine architecture is nothing but Roman architecture developed and, moreover, greatly beautified in Hellenistic hands. Just so Lombardic is but Roman work imitated and adapted by Teutonic immigrants long settled in Northern Italy. Norman is Roman work imitated and developed by people of Teutonic race settled first in Scandinavia, then in Normandy, then in England; and so with all other branches of the great Romanesque style. In fact, if we must have a new terminology, let us dub Byzantine in future Eastern Romanesque—certainly not Hellenesque. It is but the elder brother of the Romanesques of Lombardy, Germany, Provence, Auvergne, Poitou, Spain, Normandy, and England. It had the good hap to fall on favourable soil; its noblest works had for paymaster an Emperor who had at his disposal the wealth of both the Roman worlds. Western Romanesque had to wait for centuries before those poor savages, the Goths and Vandals and Visigoths and Normans and English, were in a position to work out an architecture. So Eastern Romanesque got ahead of the rest. Western Romanesque did not culminate till the Amiens or Exeter of the XIIIth century. The grand climacteric of Eastern Romanesque was the completion of S. Sophia in A.D. 537, nearly 800 years before Amiens Cathedral was begun.

The great Byzantine period was that of the VIth century, that of Justinian. But there was a revival of prosperity and a renaissance of Byzantine art in the XIth century, the culmination of which is seen in the remodelling of St. Mark's, Venice. So marked in this period is the influence of the Armenian churches, *e.g.*, those of Ani, that the work may well be called Armenian Byzantine. By that time "the government, commerce, and

industry had been invaded by Oriental and barbarous elements; the throne and the army had become the prey of Armenians and Slavs. The sculptured slabs of Georgia and the gates of the Armenian churches decorated with arabesques offer direct correspondence with Byzantine works. The Christian Orient and Constantinople reformed the architecture in the same sense. Hence the picturesque narrow corridors, tall tambours, and barbarous ornament." The later Byzantine churches are usually small, *e.g.*, the Athens Cathedral; their domes are raised high on drums, and partake of the character of central round towers, and the external surfaces are much ornamented with patterns formed in the brickwork. A prototype of this class of church is S. Irene, Constantinople, of which we give a section (see lithograph). It was built by Constantine and rebuilt by Justinian, whose monogram may be seen on some of the capitals. Rivoira is of opinion that as we see it now it is a work of the VIIIth century; the lantern-drum certainly is of late character.

The next chapters of the book deal with the difficult subject of Western Romanesque. Probably the time has not yet come when a final classification of its varieties can be established and their filiation determined. It might be well meanwhile not to speak of "French Romanesque." There is no such thing. There is one Romanesque in Burgundy, another in Auvergne, another in Périgieux, and several more. The Romanesque of Burgundy is far more unlike that of Périgieux than German is unlike Lombardic work. As regards the last two, the author commits himself to the thesis that German Romanesque is derived from Lombardy. A German archaeologist would be able to adduce some strong evidence that the reverse is the case. Nor can Ruprich-Robert's view be regarded as proved, that Norman is derived from Lombardic. Norman is as much like German Romanesque as it is like Lombardic, and the geographical difficulties are far less in affiliating Norman and German Romanesque, whose boundaries were largely coterminous. The author admits, indeed, that in the north of France to the very end of the XIIth century there



Plan of Temple of Minerva Medica.

is marked German influence in the planning and in the tower-groups of Tournay, Soissons, Noyon, Valenciennes, and Chaalis. As for the Lombardic origin of Norman Romanesque, it hardly seems possible to attribute it to Lanfranc. He did not become Prior of Bec till 1045, and a considerable time must be supposed to have elapsed before he obtained such power in the ducal court of Normandy as to be able to introduce an alien style of architecture into the country. No theory can be held adequate which does not account for the great abbey church of Jumièges, recently illustrated in these pages. Jumièges, with its alternation of compound piers and cylinders and vaulted tripartite chamber, smacks of Lombardy more than any later church. But it was begun five years before Lanfranc came to Bec. Lanfranc, then, can have had nothing to do with the Lombardic design of Jumièges. On page 132 another statement should be corrected. Counterbutting arches are stated to exist in the triforium chambers of Gloucester choir and Norwich, intended to resist the thrusts of the vaults that were contemplated. As a matter of fact, there are not, and never were, any such arches at Norwich, but supports were provided for internal flying buttresses. Whether such were ever constructed cannot now be determined. At Gloucester the abutment consists of a demi-berceau strengthened by ribs.

On Gothic Professor Lethaby writes with enthusiasm and eloquence. We wish we had space for quotations. A long account is given of Gothic in France. This, however, has been done before again and again. We think it is a mistake to identify French Gothic with the Gothic of the Ile de France. The space that has been expended on a detailed description of the Northern Gothic cathedrals might well have been devoted to what nobody yet has worked out, *viz.*, French Gothic other than that of the Ile de France; the Gothics of Burgundy, Normandy, Brittany, the Plantagenet Gothic of Anjou, the hall-churches of the South. These are still unsung, and are full of beauty and interest. We are a little weary of Amiens and Rheims, and should like to have Coutances, Semur-en-Auxois, Poitiers Cathedral, Albi, analysed and described.

Of English Gothic the treatment is very inadequate; it is despatched in eight pages. We venture to think also that it is thoroughly erroneous, if the result of the author's Continental experiences is to convince him that "if the Gothic of England comes next to that of the Ile de France, it is because England was so far French"; or that "English Gothic is but a provincial variety of the great original style, a *patois*—it is a decorative form of French art"; or that "Gothic art in England was a true development continuously influenced from France—any rate, till the building of Westminster." So speaks the Professor *ex cathedra*; he gives no reasons. Without such reasons we would not accept such assertions, not even from a whole university of professors. We assert ourselves, also without reasons, not having space to state them here, that all this pedigree-hunting is the merest futility; that the builders of Lincoln and Coney, and Semur and Albi, and Ulm and Segovia worked out their artistic salvation almost wholly in independence of the other, just as did the builders of the Ile de France; that the different schools are sister schools with parallel development, not daughters of a Parisian am; and that if we in England took a few hints from Canterbury choir, the French took several from the octagon and choir and Lady Chapel of Ely. Nor do we believe for one moment that "the causes which underlay Gothic art" are to be found in a long infiltration of the oriental spirit to the point of saturation." But if the book at times stirs up controversy, it also stimulates thought; it is marked by real ability, earnestness, and insight.

EXAMPLES OF WROUGHT-IRON WORK.

THE folio volume of illustrations of English and Scotch iron work by Mr. Murphy* is one of the finest books of illustration of ancient art-work that we have seen. Its merit consists not only in the fine character of the examples selected and the care with which they are drawn, but also in the complete manner in which their illustration is carried out. Geometrical measured drawings of such work are the only kind that are of value, giving the construction of the work; but they do not give its effect. To supply this side of the illustration, a number of reproductions from photographs from the actual work *in situ* are added; so that the reader sees on one page the effect of the work, and can then turn to the measured drawings to study the manner in which this effect has been arrived at. In addition to this, in several instances floor plans of the houses and their surroundings are given, so as to show in what relative positions the grilles or gates illustrated are placed in relation to the house. In this manner the work illustration is carried out as completely as it is possible to have it. The work includes eighty plates, but not so many different sites are drawn

upon as might be expected, since Drayton House (Northamptonshire) occupies nineteen plates, and Belton House (Lincolnshire) the next eight. But the examples from these two places are among the finest and most varied that could be found; and indeed there is nothing illustrated that is not first-rate of its kind. In looking through the examples from these two houses one is struck by the admirable manner in which the more decorative portion of the designs is distributed. The gates and railings retain for the most part their proper character as fences. The great mass of them consists not of scrolls and twists, which have a weak effect when too much indulged, but of upright parallel bars linked together and supported by horizontal pieces, the appearance being enriched by intermediate bars at the base, and by small pendants introduced at the top; but the practical character of a fence is not lost sight of. The gateway of the south avenue at Drayton House, with the railings at each side, shown to a small scale on Plate II., is an excellent instance of this. The gates are plain grilles over most of their surface, with intermediate spear-head bars about 2 ft. high at the foot; the decorative treat-

ment being confined to a narrow band down the outer edge of each gate (forming a double band when they are closed), and between the heel of the gate and the stone pier is what may be called a broad pier or pilaster of scrolled open work between strong uprights, forming the real piers on which the gate hinges. These again abut against and are fixed into the massive stone piers, which are not such good specimens of masonry design as the gates themselves are of metal design. Outside of the stone piers the railings extend in bays 7 ft. long of nearly plain railing, these bays being divided by a kind of pilaster about 14 in. wide of decorative scroll work with a special finial. Thus the character of a defensive railing is preserved, and the plainness of this gives additional effect to the decorative portions introduced at intervals. This design is quite a lesson in the treatment of a fence of this kind. Above the top bar, both in gates and railing, the artist has allowed himself a free hand in decorative heads, but this is just where free play of line can rightly be allowed; the constructive and utilitarian portion of the work finishes with the top rail; the rest is play, and is treated accordingly. The Belton work is treated in the same



*English and Scottish wrought-iron work: a series of examples of the best periods, together with many of the examples now existing in Scotland, with descriptive notes. By Bailey Scott Murphy, Architect. London: Batsford. 1904.

In Austria there are Government Diplomas but they are little sought after. In Hungary an architect aspiring to an official position requires a diploma from the Polytechnic school of Buda-Pesth. In Holland the State Polytechnic School grants a diploma, but it is not obligatory; in Portugal a similar condition prevails. In Greece the School of Art of Athens grants a diploma to those seeking an official position. In France the Government gives diplomas to the nominees of the Ecole des Beaux-Arts, and the title "Architecte diplômé par le Gouvernement," but these diplomas confer no privileges or rights, and no official architect need possess them. The only countries where architects are in the position to which the English Registrationists wish to bring them are Italy, Spain, and Russia. In reference to the social effect of Registration in the last-named enlightened country, we may call attention to the short letter by Mr. Reavell in our correspondence column.

After a good deal of absurd misrepresentation in the press, Dr. Waldstein has at last, in a letter in Monday's Times, fully satisfied every unprejudiced reader that his proposal to form an International Committee for carrying out the excavation of Herculaneum, he has been acting with the full knowledge and approval of the Italian Government. Everything has been done in proper form, and the Italian Government has given its formal and official consent. It is to be hoped that his great and most interesting archaeological enterprise may soon come into practical operation. It is not as if it were a buried Greek city, certainly; still, the imagination cannot but be excited at the thought of the possible discoveries to be made in unearthing the long-buried streets and houses.

In a letter to the Times, Professor Henry Robinson urges the desirability of utilising the excess rainfall of wet seasons to meet the deficiency of dry years. For some years Professor Robinson has consistently advocated the construction of impounding reservoirs for the benefit of the community in times of drought, and incidentally for reducing the amount of injury caused by floods; a course which has also been advocated over and over again in our own columns. In a sense, no doubt, every waterworks reservoir is engaged in performing this duty in a small way, but the principle requires extension on a very large scale, and particularly in connexion with rivers and streams all over the country, if any real good is to be accomplished. Taking the case of the Thames alone, we have an immense opportunity for useful work. In rainy seasons the channel above Teddington cannot possibly carry off the flood waters, and in dry seasons the bed would be almost dry if it were not for locks and weirs. An intelligently designed system of reservoirs would be an incalculable boon to the population of the Thames Valley. However, in the absence of a single authority endowed with ample powers and very adequate funds, it is hopeless to expect anything of the kind. Local government may be

all very well in its way, but county and district councils are generally averse to co-operative measures for the common good.

The Traffic Problem.

ONE of the greatest difficulties encountered by all who attempt to deal with the traffic problem in great cities results from the continually increasing desire of the inhabitants to make use of facilities for locomotion. The congestion due to growth of population is of far less moment, although sufficiently perplexing to traffic reformers. In the course of his paper, read at the Society of Arts, the Hon. Robert P. Porter remarked that within twenty-five years the number of journeys had increased in New York from forty-seven to more than 400 per head of population. Indeed, as Sir William White said on a recent occasion, nobody in New York seems to walk a few hundred yards if he can ride. We appear to be arriving at the same condition in London, for the number of journeys per head has increased almost as much as in New York during the last generation. Even assuming no further increase of what Mr. Porter termed the "travelling habit," the growth of population every ten years will provide 200 million fresh passengers to be dealt with, representing one-third of the total number carried by all the metropolitan railways now in operation. Thus it becomes tolerably clear that new means of transport must be filled up as quickly as they can be provided, and that ceaseless activity on the part of promoters and constructors is an absolute essential, unless things are to go from bad to worse.

The Cudworth Railway Accident.

WE quite agree with the verdict of the jury in the inquest on the victims of the railway accident near Cudworth, that there was not "sufficient evidence to convict any one criminally"; but one thing the evidence does go to show most decisively, viz., that the machinery for protecting trains in a fog is ridiculously primitive and inadequate. The principal element in causing the accident was the coming on of a sudden and unexpected fog, yet the signalman at the Cudworth cabin stated that "usually it took an hour to get the fog signalmen on." When asked if he could not have run down and put a detonating signal on the line, he made the reasonable reply that he was too much occupied at the moment with receiving and answering signals to be able to leave his cabin. But to think that the lives of passengers, in a sudden fog, depend upon collecting together men who cannot be on the spot under an hour! Railway companies ought to be ashamed of having no better resource at this time of day. It surely should be possible to devise a fog signal which can be actuated from the signal cabin.

Automatic Railway Couplings.

ALTHOUGH the employment of automatic couplings was recommended more than thirty years ago by sundry Board of Trade inspectors, none of the railways in the United Kingdom use them, except a few companies by whom they have been applied to passenger carriages. One

circumstance which may account for the general indifference exhibited by British railway companies to automatic couplings is the comparatively small number of accidents in this country during shunting operations. In the United States, where the old "pin and link" coupling was generally retained until the Act was passed rendering the use of automatic couplings compulsory, the number of casualties amounted to 11,710 in 1893, as against 297 in the United Kingdom. Since that year the number dropped to 2,273 in 1900, but rose to 3,719 in 1904, chiefly owing to defective equipment. Thus the necessity for reform in our own country is not so pressing as it was in America. Still even a few lives are worth saving every year, and the reward of the companies will come in the greater capacity for work of the goods yards and the dispatch of trains with less expenditure of time. The one essential is to find a type of coupling likely to meet the approbation of all the companies, and this can only be done by the institution of trials such as those recommended by the Royal Commission of 1900.

Landlord and Tenant.

A CURIOUS legal point in relation to flats seems to be raised by the case of Hargroves, Arowson, & Company v. Hartopp and another. The premises were let in separate floors, and the plaintiffs' were lessees of the third floor. The roof was not vested in any person, but as the judge of the City of London Court had found, it belonged to, and was under the control of, the lessors, the defendants. The plaintiffs' premises became flooded with water owing to the gutters in the roof having been allowed to get choked. There was no neglect in repairing the roof, the sole cause of the damage being this temporary obstruction in the gutters. The Divisional Court affirmed the judgment of the Court below, holding defendants liable for the damage for neglect in clearing the gutters in the first instance, and in also failing to do so promptly after notice, since they had retained possession of the roof; but the decision does not seem to have been clear of doubt, and the Divisional Court, consisting of three judges, gave further leave to appeal.

Writing and Illumination.

Two short papers, on "Calligraphy," by Mr. E. Johnston, and on "Illumination," by Mr. Graily Hewitt, were read at the Society of Arts on Tuesday evening; part of the scheme of lectures organised by the Applied Art Committee. The former is a somewhat new subject to be treated from the point of view of an art, though it is well worth regarding in that light; and it seems that attention was drawn to the subject at South Kensington by a consideration of the bad writing in which drawings delivered in the art school were entitled and described by students. Mr. Johnston's series of examples shown on the screen, from Roman writing down to the Renaissance period, were very interesting, and attention was drawn to the relation which the form and character of the letters had to the instrument which made them; many of the characteristic forms of

letters, and the position of broad and narrow strokes, arising naturally, as was shown, from the action of the pen when used upright or slanting. The scripts shown were those used in deliberate book-writing, not in ordinary correspondence or memoranda; as the lecturer observed, most of us in the present day have two hands, that which we use in an important letter carefully written, and that which we use when time is an object. An interesting lecture might be given, however, on the picturesque element in ordinary everyday handwriting, with some examples of the splendid handwriting, in their ordinary correspondence, of some of the great Renaissance artists; a writing worthy of a great age of art. The finest that we remember to have seen is that of the architect, Alberti. The hurry of modern life, no doubt, is against beauty in handwriting—not to speak of the intrusion of type-writing, which, except in purely business communications, we dislike, as destroying the personal character in a letter; still, we came across a fine modern hand now and then, picturesque without effort or consciousness. Two of the finest hands we have seen were those of two late eminent musicians (S. S. Wesley and W. T. Best); and we could name a London architect, still fortunately among us, whose handwriting is worthy of a Renaissance artist. Position and occupation in life do not seem to have much to do with it, however; of the two very worst and most exasperating handwritings we have ever known, one was that of Dean Stanley, the other is that of an occasional contributor of some short but useful trade paragraphs to this journal, which the printers somehow seem able to read, but the editor certainly cannot! The other paper of the evening, on Illumination, suffered under the disadvantage that the lantern illustrations could not give colour, but was disappointing in other respects; the examples given, though described by the lecturer as "very jolly" (a colloquialism of the atelier which seems out of place in a public lecture), were not of the best in point of design; even the elaborate modern example given at the close, as a sample of what illumination could do, impressed us, in spite of beauty of detail, as being undecorative both in its general lines and in its relation (or non-relation) to the text. But the subject itself is far too large a one, in any case, to be treated in a short paper.

Pictures
by Mr.
Oliver Hall.

WE confess that we would rather meet Mr. Oliver Hall as an aquafortist than an oil-painter. His collection of small pictures at the Dowdeswell Gallery is certainly anything but commonplace; he has a style, and a thoughtful way of regarding nature; but his pictures are depressing from a certain want of light and air about them, and an apparent aversion to showing any detail sharply and clearly, even in the foreground. They are not of course intended to be like nature; they are nature translated into moods; but the moods are sombre. "Portsmouth Old Town" (5) is perhaps the best of the collection, and is a good example of the manner in which a picture may be made out of a scene of

this kind, in which nothing realistic is attempted, but in which everything falls into its place as part of a conception in composition and colour. A picture of an analogous subject, "An Old Seaport Town" (27), though not equal to the one just named, has the same kind of interest, and also shows an apparently intentional adoption of something of the manner and colour of an older period, as if in harmony with the subject. Mr. Hall has a very broad style of handling, as shown for instance in the painting of the masses of reeds by the water in the largest picture, "Beaulieu Marsh" (10); there is no indication of detail, yet the effect is conveyed. This is, no doubt, an intellectual handling of paint, only one asks whether it is not possible to be too intellectual; we sigh for a little of what Constable called "God's daylight."

A WELL-KNOWN London architect sends us a letter which he has received, the nature of which is apparent in the following extract:—

Competition
Ghosts.

"I note that there is a competition open for the above and would like to know if I may prepare designs for same upon speculative terms, should you anticipate entering.

For several years past I have made a special study of this class of building, and have found great mutual advantages arising from a combination of local experience and that of experts who devote all their time to such work, my designs having been placed first and second under assessors' awards in a large number of recent open competitions.

Devoting all my time to such work, I am enabled to accept very moderate fees, depending almost entirely upon success."

We do not suppose there can be many people doing this kind of thing, or we should hear of it oftener; and as to the statement that his designs (under another person's name) have been often placed first by assessors, that is probably a mere piece of brag intended to bait the hook. A man who would address that kind of letter to an architect in good position would say anything. Whether he has really found any architects to accept his assistance one cannot tell, but if so, one knows pretty well what sort of architects they must have been. He has written to the wrong man this time, at all events; and perhaps this may be a warning to him not to insult architects of standing and reputation by sending them such proposals.

KING'S COLLEGE ARCHITECTURAL SOCIETY.—Arrangements have been made for a series of papers to be read before this Society, to which all fellow-students or architects outside the college will also be welcomed. The first lecture, on Thursday the 9th inst. (5.30 p.m.), will be by Mr. Houghton, on "Christchurch Priory."

EDINBURGH AND LEITH BUILDING TRADERS.—The thirty-third annual general meeting of the Edinburgh and Leith Districts Building Employers and Allied Trades Association was held on the 24th ult. in the Building Trades Exchange, 26, George-street. The Chairman, Councillor Macleod, presided, and in moving the adoption of the annual report commented on the dull state of trade during the past year and the very large number of men unemployed. The report was adopted. In the following office-bearers were elected for the ensuing year: Chairman, Mr. James Forrest; vice-chairmen, Mr. Patrick Knox, Parish Councillor Wilson, and Mr. W. Thomson; secretary and treasurer, Mr. James Cameron, solicitor. The following gentlemen were added to the Executive:—Mr. Robert Lamb, Mr. Andrew Davis, Councillor Macleod, Mr. A. Cruikshank, Mr. Taylor, Mr. J. R. Watson, Mr. James A. Craw, Mr. Macdonald, and Mr. John Lowrie. Delegates and representatives were also appointed to the Scottish Building Trades Confederation.

LETTER FROM PARIS.

THE fall of the ministry presided over by M. Combes has had, as an unexpected consequence, the creation of a Sous-Secrétariat des Beaux-Arts, of which the titular Secretary, M. Dujardin-Beaumetz, is, for a wonder, an artist of undoubted competence for such a post. He is a painter, member of the Société des Artistes Français, who has received a medal at the Salon for his pictures of patriotic subjects. His late wife was also a painter of talent, who from 1880 to 1888 exhibited, under her maiden name Mlle. Marie Petiet, various *genre* pictures which attracted a good deal of attention. This creation of a new post will probably lead to the retirement of the actual Directeur des Beaux-Arts, M. Marcel, who, in the course of a brief period of office, has given proof of competent artistic knowledge. He may perhaps be accused of having shown too great a partiality for the Impressionist school, and of having been largely concerned in setting on foot the unfortunate "Salon d'Automne"; but these errors were compensated for by a real administrative capacity. At all events, the choice of M. Dujardin-Beaumetz for the new office is a fortunate one.

The fine estate of Bagatelle has at last been definitely purchased by the municipality of Paris, for 500,000 francs. It remains to be seen what they will do with the château, built by order of the Comte d'Artois, brother of Louis XVI., on the façade of which he had engraved the motto, "Parva sed Aptata." There is talk of turning it into a sanatorium for the children of the primary schools, a proposal which will not be very welcome to the fashionable society which frequents that part of the Bois de Boulogne. It would be much better to make it a museum of XVIIIth century pictures and furniture, which would undoubtedly be very successful in so charming a home. As to the large park, of about 55 acres, that has already been opened to the public, as an annex to the Bois de Boulogne.

The bridge at Passy, on which the south circular line of the Metropolitan railway is to cross the Seine, is expected to be finished this spring. The bridge, which is the most considerable engineering work on this line, will cross both arms of the river. The larger portion of it will have a centre arch 54 mètres wide, and two other arches of 30 mètres each. The other section will have a centre arch of 42 mètres, and side arches at the banks of 24 mètres each. The two bridges carry, on cast-iron columns, an upper bridge 7 mètres wide which will take the two lines of the Metropolitan. The cost of the bridge is estimated at 3,800,000 francs, and the accessory works at about four millions, making a total of 7,800,000 francs.

For the line No. 7 of the Metropolitan the terminal station is to be formed on the Place du Carrousel, near the Gambetta monument, with a subterranean corridor leading to the Palais Royal station. Ultimately it is expected that the gates from the Tuileries on to the Rue de Rivoli will be enlarged.

The managing Committee of the Fondation Rothschild, which has for its object the improvement of the material condition of the artistic class, has opened a competition, to be carried out in two stages, for the erection on one of its sites which it has acquired from the municipality of a group of model dwellings, containing small habitations which are to be sanitary and economic. The public exhibition of the designs in the first competition will be held from the 3rd to the 8th of April, and that of the second competition designs from the 3rd to the 8th of July. M. Nénot has been appointed the principal adviser for this competition.

A monument is shortly to be erected at Neuilly-sur-Seine to the memory of soldiers born within that district who have died in fighting for their country. M. Raoul Verlet has been commissioned to carry out the work. His design shows a figure of a woman with helmet and cuirass, who symbolises "La Patrie et le Deuil," supporting a dying soldier who leans against the muzzle of a gun. As a whole, it is a fine and decorative work.

M. Loviot has been appointed architect to the Musée Guimet, as successor to M. Gagné. He latter has been appointed architect to the Musée Odeon, the late architect of which, M. Paul Frédéric Buval, died recently at the age of eighty-eight, after a life full of honourable achievement. His son, Paul Buval, also an architect, and member of the Société Centrale, died some years ago.

THE ARCHITECTURAL ASSOCIATION.

An ordinary fortnightly meeting of the Architectural Association was held on Friday at week at the new premises in Tufon-street, Westminster, Mr. E. Guy Dawber, President, in the chair.

The minutes having been read by Mr. H. Tanner, jun., Hon. Secretary, and confirmed, and some nominations having been read, the following gentlemen were elected as members, i.e., Messrs. J. K. Ground (Maidstone), A. Whitehead (Sidcup), R. M. Kelly (East Ham), H. D. Ward (Grays), and H. E. Bunce (Upper Clapton).

The President announced that the following members had re-joined, i.e., Messrs. Christopher Shiner, Ellis Marsland, Cyril E. Power, and S. Yates.

The Building Fund.
He also announced the following further contributions to the Building Fund:—

	£ s.		£ s.
Charles Morrison..	100 0	J. H. Pye	5 5
Altar Case ..	10 10	Gill Brothers ..	2 2
Potter ..	10 0	J. Parnell & Son ..	2 2
Bagley & Sons ..	5 5	Alfred East, A.R.A.	1 1
Crittall & Co. ..	5 5	Higlett & Hammond	1 1
Wyward & Wooster	5 5	F. J. Lloyd ..	1 1
Wm. Leno ..	5 5	J. R. Moore-Smith	1 1

The President said he had much pleasure in announcing these amounts and in stating that the total received since the last meeting was thus 9l. 8s.

The late Mr. Blashill.

The President said he regretted to state that at the last meeting the Association had lost the death of one of its oldest members. He need say much about the late Mr. Blashill, for of them must have known him either personally or by name. He joined the Association in 1857, and some years afterwards he became president. Many years ago Mr. Blashill organised a very successful trip to Italy. He is President would but be voicing the feelings of all of them in proposing that a vote of condolence be forwarded to the widow and survivors of the deceased.

The vote was agreed to in silence.

Mr. Louis Ambler, Hon. Secretary, announced the following donations to the library:—Parcel of French architectural journals, presented by Professor Aitchison, R.A.; "Old Cottages of the Tisbury District," by E. Guy Dawber and G. Davie, presented by B. T. Batsford; "Principles of Planning," by P. L. Marks, presented by B. T. Batsford; "History of Architecture," by B. F. Fletcher, presented by B. T. Batsford; "Academy Architecture," 1904 (2), presented by Mr. Alex. Koch. A vote of thanks was accorded to the donors, and also to Mr. Andrew for presenting a number of negatives of such cathedrals, and to Mr. J. D. Crace for sending a print of the old bridge at Exeter.

Byzantine Architecture.

The following papers on Byzantine architecture were then read:—
The first paper was by Mr. J. B. Fulton, one said:

One of the first-fruits of Christianity was architecture, spreading over Southern Europe, Palestine, and Asia Minor. It would, indeed, an interesting study to trace the influence of the Roman building down to the Byzantine mode. The influence is evident, as the architects must have visited Rome, and there they studied the great temples and baths; but the mans, with all their power of knowledge in construction, and imagination in design, could never have built S. Sophia.

Now, I wonder if we have realised that the domes down through the ages have built their latest works to their God; here, in this new religion, we have everything carried to a greater height of excellence. Byzantine architecture is a revelation to the world, because it was not until the building in the knowledge of beauty and truth, it was also the beginning of a higher and nobler power—soul-passion moulded in building. I could have written an elaborate treatise on the history of this style, but history is not particularly helpful in design, and anything which I say to-night must be for the furtherance of his great study.

In sketching a building one ought, I think, to see design first, material, etc., afterwards; so in our thoughts and studies let us seek after food for our creative faculty in architectural design. I desire to show you in examples of Byzantine architecture—examples well-known, but not one-half appreciated, as we do not fully realise the beauty and truth of construction in this style.

CONSTANTINOPLE: S.S. *Sergius and Bacchus*. Originally there were two churches; the

existing one is a gem, and is in a wonderful state of preservation. The exterior shows domes resting on a great square base which, although bold in conception, is not very beautiful, but here little or nothing of the original detail is left. The dome is supported by eight piers, the arches forming an octagon, but below the arches the angle sides of octagon are semi-circular recessed (and it is these recesses which give to the interior such a charm). The entablature of the first order shows a breaking away from classical tradition, although retaining architrave, frieze, and cornice.

This entablature gives strong horizontal lines, which are required because of the semi-circular recesses, etc. The whole proportion of the lower story is perfect, and impresses one very much. The delicate detail of capitals is worthy of special note, although they are now half-buried in whitewash; note also the bold and ingenious way in which a combination of capital and entablature takes the round to the square on the upper columns.

There are numerous churches of a later period in Constantinople, such as:—

S. Theodore, Tyrone.

The outer narthex is comparatively large, and, although the façade in itself is good, I think it unworthy of the best traditions of this style, as it is false to the plan. The church in plan is a Greek cross. The columns supporting the dome seem rather weak.

S. Theodosia. (Now Gul-Jami.)

The plan is an interesting one. The whole effect of the interior is achieved by form, as there is no detail.

Church of the Monastery of the Chora. (Now Kahryich-Jami.)

The façade of this church is thought to have served as a model for St. Mark's, Venice. The glory of this church is the decoration. There we see what the Byzantine architects were aiming after—true architecture, which means the unity of the three arts; revealing the character of the building. Constantinople is well worth a visit to see these mosaics alone, even although they have suffered by fire and earthquakes. I had the privilege of drawing the figure of St. George in the outer narthex, which is undoubtedly the finest study in mosaic that I have ever seen. With the exception of the head, hands, and feet it is very excellent, showing in its every line the true spirit of decorative design.

I wish you to return to SS. Sergius and Bacchus, and from there we will go direct to S. Sophia. We see in SS. Sergius and Bacchus the germ; in S. Sophia the idea fully developed. This is one of the most talked-of buildings in the world, and, if it is not, it ought to be one of the most admired. You must all be familiar with the general conception of S. Sophia's great dome, half domes, semi-circular recesses, narthexes, aisles, and great buttresses. The exterior is said to possess little architectural beauty. I think this impression is arrived at because of the stucco with which the original material is covered. I would suggest the taking away of the stucco, the minarets, buttresses, and innumerable small Turkish buildings, which are out of harmony with the main building. Now look at the design with all these removed; see the great buttresses, the arch between, the semi-domes and great dome rising from the square base. Is it not a magnificent pile? The glory of the building is the interior; here the three arts meet in perfect harmony (as they also met 500 years before in the capitals of the north portico of the Erechtheum, in Athens). The passion and mystery is marvellous. No other building can compare with it in beauty, fine proportion, and delicate detail. I have often wondered why a building such as this can only be built at a particular place and at a particular time or period in the world's history. I have sought to penetrate the secret thoughts of the architects (Anthemios and Isidore) who built this church. Besides having a knowledge of construction and design, their lives must have been virtuous and wholly concentrated to their profession or art—to the glory of their God.

As Ruskin and others have said somewhere, no matter what we do, even draw one line and that line reveals our character. What a beautiful moral tone must have been reached before this church could have been built, as down to the minutest detail great excellence and refinement is shown. Let us think of this subject seriously, as we must possess this power before our national style can become worthy of the nation.

PALESTINE.

St. Mary's Church in Bethlehem is one of the earliest Byzantine churches known; in plan it consists of a nave and double aisle. The Golden Gate, Jerusalem, is in this style, but I came across nothing to call for special attention.

ASIA MINOR.

In Brusa we came across some interesting details such as panels, capitals, etc., but nothing of special note.

GREECE.

Athens has quite a number of Byzantine churches; all are comparatively small, although interesting. Byzantine churches are scattered all over Greece. I will mention but two, the Convent of Daphni, situated about five miles from Athens on the Sacred Way; in plan a Greek cross, and, although the construction is not quite so excellent as in the earlier Constantinople churches, it is nevertheless straightforward and good. The mosaics on a gold ground are in fine preservation—at least, what are left. The figure of Christ is especially beautiful.

I also made a pilgrimage to St. Luke's, Stiris. This perhaps is one of the most interesting that an architect can make in the quest of Byzantine churches. To visit the monastery and taste the hospitality of the monks is an experience in itself well worth having. Combine the love of fellow-men with the beauties of a vast and absolute quietness in the midst of great ranges of mountains, and you will have an idea of at least two of the attractions to this monastery in north Greece. The glory of the monastery is the Church of St. Luke. The adjoining Church to the Mother of God is not quite so interesting. The Church of St. Luke's is almost perfect in its general design and decoration. Parts have fallen into disrepair, but, as a whole, it is still in a wonderful state of preservation. Messrs. Schultz & Barsley deserve praise for bringing this gem of Byzantine art to England in book form. From my notes taken on the spot I find that what impressed me more than all else was the beauty of construction and lighting, which gave so great a mystery to the interior.

ITALY.

In Italy Byzantine art reached a high state of perfection. The centres are Rome, Ravenna, and Venice. The Church of San Vitale at Ravenna shows direct influence from Constantinople. In plan a semi-circular recess is formed from each side of an octagon except the side forming the chancel. The glory of Byzantine art in Italy is the Church of St. Mark's, Venice. In plan a Greek cross. A glance at the plan will reveal piers, etc., carrying domes forming aisles, etc. The conception of the interior is a glorious one, although to me it cannot compare with S. Sophia; it lacks the vastness and dignity, although in wealth of colour it has no equal. The lighting is well-nigh perfect, giving true value to form and colour. Ruskin thus describes it by using such expressions:

"The effects of St. Mark's depend not only upon the most delicate sculpture in every part, but as we have just stated, eminently on its colour also; and that the most subtle, variable, inexpressible colour in the world, the colour of glass, of transparent alabaster, of polished marble, of lustrous gold." These expressions give but an idea of beautiful material and fine workmanship; besides all these, there is a beauty which forms a mystery which lighting and atmosphere can only give. The façade is the finest example of an exterior in this art. The Gothic addition in the XVth century might have been better; and as regards fine architecture, is not to be compared with the Byzantine building, with its pillared recesses, delicate sculptured detail, and rich material; but, above all, the magnificent conception.

DOMESTIC.

I have seen and know but little of Byzantine domestic architecture. The Palace of Belisarius, Constantinople, is a magnificent example, and we had the pleasure of measuring it. This is what I would term a study, a decorative study, in stone and brick. There is a remarkable richness and wealth of material, and yet it is but the two commonest building materials we have. The decorative flat quality aimed after is very refined and suggestive. Some of the spandrels are specially good.

Byzantine art we must study if we truly desire our national thoughts to develop into a recognised style. See in this style true construction and excellent blending of the three arts.

Byzantine Plan-Forms.

Mr. E. F. Reynolds' paper was as follows:—The development of early Byzantine building is a subject of much interest and also of much difficulty. It is of interest because it formed an unbroken sequence in a period of disruption and change, linking the classical age of Greece and Rome with the medieval age of Christianised Europe; and also because it was so pregnant a source of future development. It is of difficulty because the influences which shaped its course were so complex, and because its builded record is now so broken and incomplete.

The founding of Constantinople is sometimes regarded as the starting-point of Byzantine art, but such arbitrary divisions are always misleading, if not altogether untrue. The removal of the capital from Rome to Constantinople doubtless exercised a very deep indirect influence, and the energy of building which it called forth must have quickened architectural development, but it was strictly a development and no sudden change of style. It is historically certain that the new capital was intended by its founder to be a direct continuation of the traditions of the old capital. In the Edict of Dedication its title was "The New Rome"; the general design of the city followed the Roman model, with its forum, its circus, its basilicas, baths, and porticoes; and its population was drawn from other cities of the Empire, and especially from Rome itself. And it is evident that this was inevitable, for Rome had so long and so completely impressed its type of civilisation throughout the Empire that no other form would have then seemed possible. Even after its removal of almost a thousand miles eastwards the capital was still surrounded by Roman traditions.

Thus, both by intention and circumstance, Constantinople was essentially Roman in its foundation. But there were also many influences which in their working could not fail to modify this tradition and prevent a mere reproduction of Roman art. The most formative of these may perhaps be summed up as (1) the renewed ascendancy of the native Greek genius, (2) the more direct communication with Oriental influence, and (3) the unrestrained play of the forces of the Christian religion.

1. The removal of the capital placed it at the source of that Greek intellectual energy which had originally brought the Romans under artistic subjection. They had largely borrowed their decorative art from the Greeks; but an inverse process was now to take place, for while the Byzantines developed that system of constructive design which had formed the real vitality of Roman work, they modified and eventually discarded the unrelated decorative design which had obscured the structural conception. Under the Romans a burden of over-developed and conventionally-applied detail had been accumulated, serving to bestow a pompous magnificence on their buildings, but only remotely expressing their realities; and it was reserved for the lively Greek sense of right-expression to translate the simple grandeur of Roman building into its decorative equivalent. Under Greek discrimination its vital principles were disengaged and purified, and decoration was once more brought into intimate relation with structural facts.

2. By the removal of the capital contact was also established with a more direct Oriental influence, for the position of Constantinople has always rendered it the centre of commercial exchange between East and West. The East has ever been the natural home of the vault and the dome, and it is there that the origin of these methods of covering must be sought. At a later time, in the great dispersal of Mohammedan conquest from its Oriental centre, the dome was always carried as a characteristic of building; and even now, in Persia and elsewhere, the dome is the common unit of roofing. To this eastern influence, which flowed to Constantinople along the great trade-routes, may be attributed that freedom in the use of vault and dome which formed so integral a part of Byzantine building. As a significant instance, the Byzantine method of vault construction was similar to the Oriental method, the courses being laid with inclined beds and independent of centring, while the Roman construction of ribs and shell was essentially different.

This influence also filtered through Asia Minor, where a local school had already established

itself, experimenting with new combinations of plan-form and arriving at the principle of the pendentive. Even the Imperial Roman buildings at Baalbek and Palmyra show something of the same tendency to break away from the academic style, in the substitution of the arch for the lintel, and in freshness of decoration. It seems as though this meeting-place of Greek and Oriental formed a kind of forcing-bed which fostered the early growth of many forms which afterwards became typically Byzantine.

3. Christianity was recognised as the State religion only a short time before the foundation of the new capital, and it was at Constantinople that it found full force of expression. It brought a new inspiration to building, needing fresh forms specially adapted to its ritual, and a new mode of decoration explanatory and symbolical of its creed. The perfunctory worship and comparatively insignificant temples of the Roman mythology gave place to an ardent and enthusiastic religion which penetrated and revitalised all the arts. Roman art had in reality been almost purely secular, and its most characteristic monuments had been the Fora, the theatres, the baths, and, above all, the great works of engineering. But from the rise of Christianity religious building again assumed the lead, and although this is now unduly emphasised by the better preservation of such works, yet there can be no doubt that the prime energy of the Byzantines was devoted to their churches.

These, then, were some of the main factors which determined the difference between Roman and Byzantine work. Following the new foundation, there was a period of 200 years' growth and formation, a time of experiment with the new forces, and a gradual assimilation of the various elements—yet a period fruitful of splendid works, and culminating with the erection of S. Sophia. The precise course of development during this period can be only imperfectly known, owing to the destruction of so many intermediate buildings. Constantinople has especially suffered from the violence of its earthquakes and the still greater violence of its riots, but phases which are missing there may sometimes be found in such affiliated centres as Ravenna and Salonica, while a comparison of the developed Byzantine forms with the embryo ideas of late Roman work often suggests the source from which that development sprang.

I propose, with your permission, to give some slight study to the plan-forms of S. Sophia, and to trace some of the earlier forms from which they seem to have been derived. If, in doing so, I traverse familiar ground, it will only be in order to give some sequence to the progression, and if I seem to have drawn to a large extent on recognised authorities, it is perhaps unavoidable in dealing with such a subject.

The uniqueness and originality of S. Sophia lies in the combination of two types of planning which hitherto had been developed more or less separately. These may be distinguished by the terms "basilican" and "radial," the basilican type being founded on a repetition of bays in length, the radial type being founded on a repetition of bays around a common centre, producing circular or polygonal figures. The essential parts of the scheme of S. Sophia are (1) a central square bay, defined by four arches set on piers, and covered with a dome on pendentives; and (2) two complex apses, applied to opposite sides of the central square and regulated by its arches. Of these two principal parts, the first may be traced to a basilican origin, and the second may be derived from the radial type of plan.

Basilican.

Turning attention first to the basilican type, The Romans had already solved the problem of the vaulted basilica, and the application of the intersecting barrel-vault to the great halls or Tepidaria of their Thermae furnishes a series of such instances on a grand scale. The weight of the vaulting was gathered onto piers which divided the length of the hall into bays, and buttresses were projected behind them to absorb the thrust of the vault. The depth of these buttresses was included within the building by an outer wall, and the chambers thus formed between them were opened to the main hall by archways, while they communicated with each other by openings through the bases of the buttresses. Lighting was obtained by a clerestory which was allowed by the difference in height between the main hall and the subordinate chambers. Such was the usual

construction of the Tepidarium, and the well-known basilica which was commenced by Maxentius and completed by Constantine closely followed its model. Here, in all essentials, were the principles of so-called "Gothic" construction—the grouping of the vaults onto recurrent points of support, the articulation of the walls into buttress-piers and enclosure, the consequent formation of aisles, and the method of clerestory lighting.

Church-building of the basilican type largely followed the earlier and simpler construction of continuous colonnaded walls and timber roofs, such as is shown in S. Sabina at Rome, in S. Apollinare Nuovo at Ravenna, in S. Demetrius at Salonica, and in the Euphrasian basilica at Parenzo. But, concurrently with these, the Byzantines also developed the application of the dome to the square compartment, and then extended it in continuous series to the basilican plan.

The Romans had always applied the dome to circular or octagonal ground-plans, and only in the latter case was any transition of plan-form necessary. In the baths of Caracalla there is an instance of an octagonal hall covered with a circular dome, and the transition is made by means of corbelling in the form of a slight pendentive; but the full development of the pendentive was essentially Byzantine, and the principle seems to have originated in the East rather than the West.

The spherical vault is intimately related to the dome set on pendentives, for the construction of its lower portion is, in fact, that of a pendentive, and the construction of its upper portion that of a dome, although there is no break in the continuity of surfaces. Such a form of vault is used in the Tomb of Galla Placidia at Ravenna, where it covers the interesting square of a Greek-cross plan, the arms of the cross being covered by barrel-vaults. The spherical vault, however, afforded no opportunity of admitting light, and in buildings of a larger scale this led to the raising of the upper part of the vault so as to form a separate dome, and eventually to the raising of the dome itself on a drum.

Plans in the form of a Greek cross naturally result from the use of a central square bay set on arches, the arms of the cross representing the depth of abutment necessary to those arches, and the generalised form of plan was of very early origin, and of almost universal use. The Romans were familiar with it, and it is supposed that its Persian tradition was imported in the cruciform mosques of Cairo. This type of the Greek cross formed a most important chapter in the history of Byzantine planning; for, with the application of the dome to the central square, the constructional meaning of the plan was extended to the vaulting, the barrel-vaults over the arms providing abutment to the thrust of the dome.

The plan of S. Sophia at Salonica shows a development of this type. The central cruciform is abutted by four compound piers, which fill its external angles and bring it to a square outline. The dome is raised on a low drum and set on pendentives, and the shallow arms of the cross are covered with barrel-vaults. This inner part of the structure is complete and self-sustaining, but three apses are added to the east, a narthex to the west, and aisles to the north and south. These aisles are opened to the central area by arcades, and they are of two heights, the upper story being the women's gallery.

The application of the dome to the square compartment being solved, the basilican plan could be covered by a series of such bays. The Church of the Holy Apostles at Constantinople (now destroyed) showed this development. The plan consisted of five compartments arranged in the form of a cross, and each of these was practically a repetition of the central construction of S. Sophia at Salonica. There were the same compound piers, the same shallow arms covered with barrel-vaults; and above them rose the domes set on pendentives, the central dome being pierced with windows. But here the repetition of the bays shows the development of their shallow arms into continuous aisles, and the division is emphasised by the colonnades carrying the women's galleries. Thus these aisles arose from the construction of the square domed compartment, their width representing the depth of abutment necessary for its arches, and their barrel-vaults giving abutment to its dome. The plan is particularly interesting, not only because the Greek cross form of each bay is repeated in the

general disposition, but also because it was the prototype of S. Mark's at Venice.

This Church of the Holy Apostles is known to us only by description, but, if it seems too hypothetical an instance, the existing Church of S. Irene at Constantinople may be quoted. It was a contemporary building, and its plan consists of two great bays covered with domes, the eastern dome being raised on a drum pierced with windows. On each side are narrow abutment-aisles, and colonnades carry the galleries over. The building has been complicated by various restorations and rebuildings, but in its main lines the design is attributed to the same period as S. Sophia at Constantinople.

The Byzantine builders had thus arrived at the domed basilica, and the central square of S. Sophia may be regarded as being founded on the bay-design of such a basilica applied on a grand scale. The plan-form is still remarkably similar to that of its Roman prototype, as shown in the vaulted basilica of Constantine. The main transverse arches are still abutted by deeply-projecting buttresses, the aisles are still formed by the enclosure of their projection, and communicate in the same way by openings through the bases of the buttresses, while the same method of clerestory lighting is preserved. But the substitution of the dome for the vault gave rise to the necessity of a continuous abutment between the main piers, and this is expressed on the plan by the increased depth of the arches which sustain the dome. This depth appears on the ground-plan as a narrow aisle on each side of the main square, and these correspond to the abutment aisles of the smaller basilican churches already discussed. Outside these are the aisles proper, formed by the penetration of the great buttresses, and beyond these again are narrow abutment aisles which absorb the thrust of the vaulting over the aisles proper. Thus the aisle system of S. Sophia shows the complete basilican design itself, the piers being represented by detached columns.

Turning now to the apses which form the second essential part of the scheme. The apse was a favourite feature with the Romans, and had been applied by them in a great variety of ways. It seems generally to have been regarded as a method of terminating a vista or series of repeated bays, its curving line satisfactorily returning their horizontal lines. In this sense, it was introduced in the basilican plan at the termination of the colonnades forming the nave, and this treatment was repeated at both ends in the Basilica Ulpia at Rome. This opposition of hemispherical forms may be seen on a large scale in the designs of the Roman Forum, and in the enclosures around the baths the same motif was often employed. In the baths themselves the apse was used with the greatest freedom, and in some instances it was applied to opposite sides of square vaulted chambers, thus almost approaching the plan of S. Sophia in a very simplified form.

The origin of the apse in the Christian church is probably derived from the "triclinia" of the private houses which were the earliest meeting-places of the new sect; but the formal position of the church-apse exactly corresponds with its use in the judicial basilicas, and the ceremonial significance of the latter may well have influenced its use in churches. The position of apses at each end of the nave was probably another instance of such parallel influence, for while Roman traditions were quite sufficient to give its origin, yet it often seems to have arisen from a change in orientation, not toward the west and subsequently to the east. However this may have been, it is clear that at the opposed apses of S. Sophia were no new invention, and their originality lay rather in the special form which they assumed. For they were of no such simple form as was employed by the Romans, but were of a highly-developed and complex character which was due to an entirely different source. This source was the Byzantine development of that Roman type of plan which I have mentioned the "radial" type, and it will be necessary to briefly indicate the phases through which passed.

Radial.

The Pantheon of Rome may be taken as a convenient starting-point. The structure consists of a great spherical dome set on a circular plan, and the arrangements for supporting the weight of the dome and abutting its thrust attained the germs of many principles which were afterwards developed by the Byzantines. The wall of the drum is of great thickness, in

order to oppose its depth against the spreading of the dome; but the weight and thrust are concentrated at regular intervals, so that the structure of the drum is not continuous but grouped into piers and connecting-walls, giving a series of recesses between the piers. The wall of the drum is carried up considerably above the springing-level, so that it gives abutment to the upper part of the dome and secures stability at the springing by its vertical weight. The church of S. George at Salonica offers a Byzantine instance which in many respects is remarkably similar in treatment.

The compound wall of the Pantheon represents an intermediate phase between the simple wall of the circular cella and the later development of aisles, and a further link is furnished in the so-called Temple of Minerva Medica. Here the articulation of the drum-wall into voids and solids is more perfectly attained, the sides of the decagonal plan being deeply recessed into apsidal chambers or exedrae. Above this lower stage a decagonal drum is raised, pierced with clerestory windows, and strengthened with buttresses which are built up from the piers between the exedrae. The dome springs above the arches of the clerestory, and the drum-wall is carried up externally.

In this instance the semi-circular chambers are separate from one another, and the next step was to connect them together by openings through the bases of the buttresses—thus forming abutment-aisles similar to those which had already been developed in the basilican plan. This is virtually effected in S. Vitale at Ravenna, where the plan-form of Minerva Medica is repeated octagonally and surrounded by an aisle, the exedrae being converted into arcades so as to open aisles and octagon into one area. The aisles are of two stories in height, the upper story forming the women's gallery, and they rise to the base of the central dome. Buttressing arches spring radially from the angles of the inner octagon across aisles and galleries at the two levels of their vaulting.

But it is necessary to differentiate between the thrust of the dome (which requires continuous abutment) and the thrust of the arcaded octagon (which requires abutment only at its angles). The function of the aisles in S. Vitale is to sustain the outward pressure of the eight arches which support the weight of the dome, and to give rigidity to its base. But the actual thrust of the dome is met by the same method as was used in the Pantheon, i.e., by the carrying up of the drum-wall above the springing, thus absorbing the thrust by vertical weight instead of by horizontal abutment. This is especially clearly shown in S. Vitale, for the springing of the dome is stilted up to the arch-heads of the windows in its base, and the lower vertical portion rises clear from the surrounding aisles and receives no assistance from them in the way of abutment.

The internal transition from the central octagon to the circular plan of the dome is managed by the introduction of slight squinch-arches over the angles, thus producing a sixteen-sided figure, which easily merges into the required circle. The eastern side of the octagon differs from the other sides, for the gallery is omitted and the main arch opens to a square bema, beyond which is placed the ritual apse.

A somewhat similar design is the Church of SS. Sergius and Bacchus at Constantinople, which was built at about the same time as S. Vitale, and only a few years before the erection of S. Sophia. It is of an interest far greater than would be justified by its scale, for it is now almost the only representative of all the churches which were built in Constantinople before S. Sophia. It is still well-preserved, and it is not difficult to trace the influence which it exercised on the apsidal-design of the greater church.

The central dome is still represented on the ground-plan by an octagon, but the eight sides are not treated alike. The diagonal sides are still curved into arcaded exedrae, but the others are straight and set back to the outer faces of the piers. This inner figure is surrounded by an abutment-aisle of two heights, and its arcades open to the central area, as in S. Vitale. The alternating treatment of the sides of the octagon is full of interest and beauty, and it allows of the introduction of the open arch to the bema in a way that is more satisfactory than at S. Vitale. The dome rises immediately above the main arches, and its external wall is carried up in the usual way to give abutment-weight to the thrust of the dome; but, as an additional precaution, buttresses are built up

from the piers of the octagon—recalling the arrangement of Minerva Medica.

The method of fitting the dome on its octagonal base is unusual, for the necessary modification occurs in the dome itself, and not in the octagon beneath it. The plan of the dome at the springing is not circular, but is formed by a sixteen-sided figure. Eight of the sides are continued up from the faces of the octagon below, and the eight intermediate sides are hollowed back to the angles of the octagon, so as to avoid overhanging. The plan thus produced at the springing gradually merges into a spherical form as the dome rises. The surfaces are so freely treated that it is difficult to describe them clearly, and they can be better studied in the measured drawings. It may be noticed that the arches which pass over the aisles and sustain the central octagon are not set radially, but are grouped in pairs on the four principal sides. The irregular shapes of the aisles are covered with continuous barrel-vaults, which are most ingeniously adapted to the variations of span.

Returning again to the plan of S. Sophia, it is at once evident that the elaboration of the apses is directly derived from such a design as the Church of S. Sergius. There is the same alternation of curved and rectangular forms, the same arrangement of arcading in two heights, a similar construction of abutment-aisles; and S. Sophia has more than once been described as the two halves of S. Sergius separated by a central square.

But, in adapting the forms of S. Sergius to the apses of S. Sophia, several alterations were made. Firstly, the three bays are disposed around a semi-circle, so that no modification of plan is necessary to pass upwards to the semi-dome. Secondly, the arches of the gallery-arcades do not intersect the semi-domes of the exedrae, but are placed below them. Thirdly, the semi-domes of the apses are not placed above the arch-heads of the three bays, but spring from the same level, and are interpenetrated by them. The reason of this last modification lies in the very different scale of the two churches. S. Sergius is a comparatively small building, and the abutment of its dome was sufficiently secured by the weight of wall carried above the springing, and by the buttresses applied to that wall; but the apses of S. Sophia are tremendous constructions of 103 ft. diameter, and the same methods would have been a clumsy expedient on so great a scale. The interpenetration with the lesser semi-domes and barrel-vault of the three bays gives efficient abutment to the great semi-domes at the critical point of their curvature, and, furthermore, reduces their weight. This ingenious distribution of thrust is typical of the whole design of the domes and vaults, and the thrust of the main dome itself is expended through the great semi-domes, the lesser semi-domes, and through the vaults of the aisles to the outer walls. The constructive genius of Byzantine design may well be said to have attained its highest expression in the engineering of this series.

The two essential parts which make up the main scheme of S. Sophia have thus been briefly traced—the central square domed compartment derived from the basilican plan, and the two compound apses derived from the radial type of plan—and it remains to speak of the adjustments necessary to their combination.

The central square is covered with a symmetrical design of dome and pendentives, and it has been shown that the natural plan-form resulting from such an arrangement is the Greek cross, the arms representing the abutment of the four arches which support the superstructure. In S. Sophia the arms of the cross are developed to the north and south by the great buttresses which pass over the aisles and sustain the east and west arches of the central square; but the completion of the figure by similar extensions to the east and west is rendered impossible, owing to the application of the apses with their deeply-curved exedrae. Neither was it possible to depend on these compound apses for the abutment of the north and south arches, for their derivation from radial structures rendered them unsuitable to withstand such great linear pressure. Hence arose the necessity of mainly absorbing the thrust of the north and south arches within the central square itself, and this was effected by the insertion of an inner arch on each of these two sides. These inserted arches carry the main weight of the dome above, while the original square is still recognised by breaks of 3 ft. which, to some

degree, are decorative rather than constructional. The side of the square measures 103 English feet, the span of the inserted arch is 74 ft.; and the simultaneous reduction of opening and increase of pier secured the north and south sub-structure of the dome without any extension of abutment beyond the area of the central square. It is probable that a certain amount of thrust from the north and south arches is taken by the apses, for the arch-heads of the exedrae are at the proper height for such service, and their inclination on plan is not excessive; but it would be difficult to estimate the actual proportion of such thrust, and especially after the centuries of earthquake which the building has endured.

Thus S. Sophia gathers into a single design those basilican and radial principles whose development I have attempted to follow—not, perhaps, with much archaeological accuracy, but rather by watching the evolution of progressive forms. But there is far more in the design of S. Sophia than can be possible to point to the source of all its various parts, and yet remain impossible to conceive how they were combined with such masterly perfection. It may be that closer links might have been furnished by churches which are now destroyed and unknown, but the wonder and delight of the Byzantines themselves seem to mark its conception as perhaps the greatest of those rare miracles which from time to time have crowned the finest periods of art. Such miracles can only arise from the gradual preparation of antecedent ages, the full devotion of a national enthusiasm, and the happy chance of a genius such as Isidorus who could crystallise the saturated aspirations around him in a single creative effort.

It may seem that I have dealt with the anatomical forms of the brick construction rather than its fair garment of marble and mosaic, but the one is inseparable from the other. There is an intrinsic beauty in the golden splendour of the mosaics, but they derive a higher quality from the curving domes and vaults which they adorn—the marble incrustation has a delicacy its own, yet only adds a grace to the power and grandeur of the walls. Byzantine building-forms themselves are full of inherent beauty, and whether they bear a wealth of gleaming colour, or whether left in white purity, they are but the fulfilment of the same Byzantine art.

Both Mr. Fulton and Mr. Reynolds showed a number of excellent lantern slides.

Mr. R. Phené Spiers, in proposing a vote of thanks to Messrs. Fulton and Reynolds, said that the papers they had had that evening were of a nature which one could discuss for a long time, and the difficulty was to restrict one's observations to the points at issue. There were two records found in Procopius in connexion with S. Sophia which were interesting, especially as they had had the opportunity of seeing the diagrams of the church. It was related that the masons at S. Sophia informed Justinian that the church was cracking and likely to fall. Justinian was reported to have visited the building and to have noticed that the wall which was erected as a centring—for centrings were sometimes used in Byzantine buildings—to support the eastern arch showed signs of cracking all the way down before the arch had been completed; Justinian was reported to have said, "Complete the arch at once, and then it will hold." Of course, the wall had been cracking in consequence of the weight on each side, and Justinian was supposed to have known so much of the theory of building that he saw that if the arch was completed the wall would not be crushed. The other anecdote was as to the arches over the aisle walls, where the masons reported that the columns of the aisles were being crushed. To a certain extent that was borne out by the fact that a great many of the columns of the aisles would seem to have sustained some damage and had been repaired by iron rings round. Justinian, it was reported, said, "Cut away some of the top of the arch wall, underneath the arch, so that the arch may have its proper bearing." That was done, and everything went right. There was no doubt that Justinian's architects were able men, and Justinian's courtiers too, in having given Justinian the credit of knowing these things. Mr. Fulton had showed the figure of the Chora mosque—the mosaic mosque it was called—and said it was thought to be the prototype of St. Mark's. It was its prototype as it existed at the end of

the Xth century. He remembered that when he was trying to reconstitute the original church of St. Mark's, he was fortunate in coming across a photograph of the church, and at once he saw features he wanted to reproduce. The five entrances to St. Mark's were originally covered with semi-circular roofs, which stood out in front of the main wall of the building. Now the spaces had been filled up, and a balcony has been constructed over the projecting porches. He read a paper before the Association in 1893, when he had some large original drawings showing the original design of St. Mark's as it had been carried out at the end of the Xth century, and the paper was published in the *Builder*. The drawings were prepared, firstly, from the most accurate plans; and secondly, from a number of drawings which had been made by a former member of the Association, he thought, and a travelling student of the Royal Academy—Mr. William Scott, who was at St. Mark's at the time they were restoring the church. He did not know to what extent it would be fair to go back to the early periods to which Mr. Reynolds had taken them. There was one point which he did not think had been sufficiently considered, and that was as to the real construction of the Pantheon walls. Mr. Reynolds said that the walls rise above the springing of the dome, but he had not dealt with the fact which was brought to our knowledge by M. Chedanne—that the construction of the dome of the Pantheon was different from that which was usually carried out by the Romans. M. Chedanne found that up to the level of about the third coffering all the bricks were laid in horizontal beds, slightly—very slightly—falling outwards. That, of course, was an entirely different method of construction from the ordinary vaults that we knew of in Rome, and, thinking of the subject, he (the speaker) remembered that he had seen similar specimens in the south of Italy. There were buildings at Baia, near Naples, which had not, he thought, had the attention paid to them by students that they deserved. They were called temples, but they were, of course, portions of public baths, of great size, almost equal to the Pantheon, and apparently built in the same way—that was to say, the courses were all horizontal and built in stone—small stones. One of them, of which half had fallen down, afforded an opportunity of seeing the construction from top to bottom, and enabled one to see another aspect, i.e., that, seen in section, it formed a pointed arch. It had nothing to do with the principle of the pointed arch, but it was evident that with masonry laid in horizontal courses there would be a difficulty experienced by the workmen when they got up to a certain height, in covering over the top, so they raised the upper portion of vault and that gave the effect of the pointed arch. It had made him think that in constructing the vault of the Pantheon with horizontal beds, there must have been some other buildings of the kind near which had suggested to the builders that this was the best means to adopt. The Baths of Agrippa were on the south side of the Pantheon, and in the plans shown that evening of that building they saw an immense hall like that of the tepidarium of the Baths of Caracalla; but he had reason to doubt the plan drawn by Palladio, who, because he found that all the other baths had a great hall, put one in his interpretation. His (the speaker's) ideas were modified when he came across a plan in a pamphlet in the Institute Library, where a different feature was shown. In the middle of the hall, which was supposed to be the tepidarium, were the remains of a large circular hall, which was more probable, as it always seemed to him to be a strange thing that in the age of Agrippa they could erect one of those immense vaulted halls like the tepidarium. As soon as he saw the plan in the Institute pamphlet he recognised that the circular building was more likely to be the type of the plan adopted in Agrippa's baths. The pamphlet was by Count Nispi-landi, and, if the plan was correct, this circular building was the famous Laconicum which was spoken of as having been erected by Agrippa. There were two or three others of the same type. There was the very well-known one at Pompeii which was perhaps not more than 25 ft. in diameter. It consisted of a circular hall, and was covered by a conical vault, built of stones in horizontal courses, and a circular opening at the top. It seemed to him that when the architect of the Pantheon was going to erect his great hall he may have thought it possible to curve the

sides so as to make a great semi-circular vault, and so he built the vault like that of the Laconicum. Mr. Reynolds's paper required more thinking over. There were other halls which he (the speaker) knew in which there was a type of vaulting recalling some of the features to be seen in the Church of SS. Sergius and Bacchus. There were two in Hadrian's villa at Tivoli in which the vaults are formed by a series of zones similar to those at St. Sergius, and the only difference was that the zones were intersected by vertical walls instead of descending on to a horizontal plane. There was the great hall of Serapis in Hadrian's villa, which was only a semi-circle, with a diameter of 80 ft., and with the same construction as in the church at Constantinople. Mr. Reynolds's paper was extremely interesting. If he had taken up S. Sophia alone there would have been quite sufficient material. They were glad to welcome Mr. Fulton and Mr. Reynolds back, and to find that they had made such good use of their time.

Professor Lethaby seconded the vote of thanks, and said he had been greatly interested in the papers, and he would be glad to see the drawings and photographs more at leisure.

Mr. R. Weir Schultz said that Mr. Reynolds's paper was very interesting, and it was pleasing to find that he had approached the study of Byzantine architecture from the constructional point of view—from the point of view of scientific building. That seemed to him to be the right way in which the study of all architecture should be approached and looked at, and it was very hopeful for the future to find that students were beginning, as Mr. Reynolds had done, to study past architecture from this point of view. He thought it was a point which should be put very strongly, that it was the real point of view from which to study past architecture from. One saw the ideas and the difficulties and the way things had developed and the way the next generations had thought to go one better and work out something finer, and one saw where they over-reached themselves and where they had succeeded so finely. If we tried to do our work in the present day in the same way, and studied it from the point of view of building and the proper use of material, we should get some really fine modern architecture. That seemed to him to be the only way to get real modern architecture.

Mr. Theodore Fyfe said that he thought they were all much indebted to Mr. Fulton and Mr. Reynolds. He could endorse everything Mr. Fulton had said about the masons in the Kachrieh Dżami at Constantinople. Mr. Reynolds had given them a really valuable contribution to the study of Byzantine planning. It was clear that he had studied his authorities, as well as the actual material on the spot. S. Sophia was unique, as the lecturers had said, but interesting approximations to its plan existed elsewhere; in particular the church at Koja Kalessi, in Isauria. The great diversity observable in the plan forms of this period was more apparent than real. In Constantinople four such seemingly different churches—SS. Sergius and Bacchus, S. Sophia, the Holy Apostles, and S. Irene—were all built on the same formative principles, as Mr. Reynolds had shown. It was curious that S. Sophia had remained unique, while the other forms had been handed down. S. Irene, for instance, appeared again in S. Antonio at Padua, some Renaissance churches, and in our own time in Mr. Bentley's great cathedral; while the type of the Church of the Nativity at Bethlehem had survived as the prevailing Latin cross plan of mediæval times. He wished cordially to support the vote of thanks.

The Chairman then put the vote of thanks to the meeting. One of the things which had struck him was the symmetrical and self-contained planning of the buildings illustrated, the marvellous arrangements of the squares and circles was wonderful, and the treatment of the domes showed that the builders of these churches were masters of their art. The way that Mr. Reynolds had treated the subject should be of great help to students. They had had excellent papers that evening.

The vote of thanks having been agreed to, and Mr. Fulton having briefly replied, Mr. Reynolds said, as to the dome of the Pantheon, that it might be argued theoretically that there would be no thrust, on account of the construction in horizontal courses; but the fact remained that its builders took very elaborate precautions to abut such a non-existent

thrust. The explanation probably lay to some extent in the timidity of the builders, but still more in the difference between theoretical and practical building. Such a dome could only be regarded as having no thrust under ideal conditions, and a disturbance by earthquake or settlement, or even by the weakening of age, might well produce considerable thrust on account of its general form, and the added abutment was a very practical precaution. In the same way, the dome of S. Vitale might be said to have been thrustless, considering its construction of hollow tubes inserted into one another in a continuous ascending spiral; but the slightest failure would inevitably set up an tendency to spread which was evidently foreseen and provided against.

The Chairman announced that the next meeting would be held on February 10, when Mr. C. S. Spooner would read a paper on "Church Fittings."

The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

L—LAW SOCIETY'S HALL AND GAIETY RESTAURANT.

For the first excursion of the current series, held on Saturday, the 28th ult., two important London buildings were selected, both of which contained much that was valuable to a student; and it may here be said that too much was attempted in an afternoon, for time prevented thorough study of both subjects for which facilities had been granted.

At the Law Society's Hall in Chancery Lane the members were received by the Secretary, Mr. E. W. Williamson, and conducted to the older parts and then to the more recent additions to the premises. The former contain many well-proportioned and dignified apartments, in some of which the principal effect is obtained from a large classic order having scagliola columns and pilasters imitating red granite and porphyry. Various well-known architects have been employed to make additions—notably in 1846 Philip Hardwick and Edward Blore, and their work in the library, council room, and hall is of considerable interest. As it was to the recently completed wing, opened by the King in June, 1904, that the attention of the visitors was especially directed. Here the architect, Mr. H. Percy Duns, explained the difficulties of his work and gave much general information. We must refer our readers to a full description and exterior and interior views of the extension which appeared in our pages of April 23, 1904, and confine our present remarks to some generalisations. The first impression is one of acute contrast in the early and the latest work. The classic tones and general orthodoxy of the 18th century work gives place to living colour and vigorous originality without any loss of dignity. The Common Room, the chief apartment of the new wing, is a stately chamber, cleverly and happily contrived to meet the limitations in lighting and the quiet comfort of the occupants. The decorative power of the combination of Cipollino marble masters, dark mahogany wall panelling, and alla Robbia friezes is very considerable; yet, riotously enough, the internal and external sales of this part of the building appear to be quite at variance. The refreshment-room and the smoking-room are tasteful in their oak-panelled treatment, but the new main staircase adds importance from the absence of a more ornate and extended view.

The courtesy of the Society in admitting so large a number of strangers was much appreciated, and the magnificence of the house prompted comparisons with the limited premises tenanted by the leading body of British architects.

At the new Gaiety Restaurant a good deal of heavy stone construction and some delicate monumental plaster decorations were the chief points of interest. Mr. Ford, of Messrs. Runtz & Ford, the architects of the work, received the visitors and kept them informed upon the necessities of the plan. In general the building comprises on the ground floor a large central entrance leading to the restaurant at the back of the site, and on the left is a public bar, while to the right the famous "Short's" is a bar, now standing isolated in a temporary position, is to be housed.

The first floor contains a ballroom, private dining-rooms, and a suite of Masonic rooms, of which the banqueting-hall is "Byzantine"

vaulted in plaster, the effect of which on ordinary taste is unpleasant, whatever may be the requirements of the craft. There is a grill-room and a large kitchen in the basement, and the remainder of this large structure is divided into small residential suites suited to the needs of bachelors.

Much has been said in public about the overpowering effect of the height of this building, and it is further to be deplored that the praiseworthy effort of the London County Council to acquire uniformity in the design of this vast Strand improvement, as evidenced by the competition held some years ago, should have proved abortive. These great Portland stone façades, the cornices of which project 4 ft. 9 in., are, in the main, designed by Mr. R. Norman Shaw, and it must be said that, in the absence of conforming to the lines of the adjoining building, the external expression has a more truthful reflection of the interior than its neighbour possesses.

Many members were interested to observe that our great governing authority is flexible, upon its own estate, in the matter of vexatious points of construction, and has banished all soil and other waste pipes from the fronts.

THE SURVEYORS' INSTITUTION.

The usual fortnightly meeting of the Surveyors' Institution was held at No. 12, Great George-street, Westminster, on Monday evening, the President (Mr. H. T. Stewart) in the chair.

The Secretary read the minutes of the last meeting, which were confirmed.

The Late Mr. Blashill.

The Chairman said that since they last met the Institution had lost an esteemed member of the Council and a valued colleague by the death of Mr. Thomas Blashill. It was not his intention or wish to dwell that evening upon the merits of their lost friend and upon his high qualities—they were known to them all. He could not, however, allow the opportunity to pass without paying some small tribute to the qualities which enabled him, without any influential connexions or any particular social advantages beyond those which were common to all of them, to attain to the important and responsible position of superintending architect of the L.C.C., and also to a seat on the governing body of that Institution, as well as a kindred institution. Some of them did not, perhaps, on all occasions see eye to eye with him on questions of public policy, but none of them failed to recognise and appreciate the honesty of his purpose and what he might term the spirit of superb independence which characterised all Mr. Blashill's words and actions.

Rural By-laws.

Mr. Herbert Smith resumed the discussion on the papers read by Mr. A. R. Stenning and Mr. R. Menzies at the last meeting of the Institution, and reported in the *Builder* of January 21. He said that probably all present had had some experience of the working of local by-laws, and had come to the conclusion that some reform was necessary with regard to this important question. The by-laws, which, taken as a whole, had been of considerable benefit, were founded upon the Public Health Act of 1875, but in his opinion in country districts a great injury to public interests had occurred by the mischievous attempt to adopt the by-laws of London. Many by-laws were so absurd and drastic that they were injurious in several directions. First, they prevented the building of the necessary number of cottages for the proper housing of the rural population; secondly, they were burdensome to the landowners who had suffered much through agricultural depression; thirdly, they stopped speculation, and, in consequence, stagnated trade; and fourthly, they were often productive of very ugly buildings, and prevented houses being built which would be in harmony with rural surroundings. For a number of years he had been a district councillor and chairman of a parish council, and he did not want to criticise so severely the constitution of those councils. As, however, Mr. Stenning had pointed out, the power of selection had been placed almost entirely in the hands of the small voters, who were not responsible directly for the payment of the rates, and this in many cases had resulted in the election of men who, although for the most part honest and conscientious, were hardly competent people to decide and judge on the magnitude of the

interests committed to their charge. It might seem a strong assertion, but he did not hesitate to say that the greatest enemies to the proper housing of the working population in rural districts were those who proposed to look most after their interests. If the new model by-laws of the Local Government Board were without exception adopted in rural districts a much more satisfactory state of things would exist. Rural England would then be rural England under one set of by-laws. Now, however, it was under by-laws compiled for the most part by unqualified persons from urban by-laws, which, as had been stated by Mr. Vernon, were bewildering in their inconsistency. Not long ago a landowner applied to him to purchase for a client a small piece of land, on which he was desirous of building cottages for workmen. He said that the by-laws in the district in which his estate was situated were so drastic and unreasonable that it was impossible for him to build in his own district. An instance of extraordinary inconsistency with regard to building by-laws was told him a short time ago. A labourer lived in a cottage which was condemned by the local authority, and that labourer was allowed to build a small corrugated iron building on an allotment, which was in every way inferior to the condemned building, and live in it. He could not vouch for the truth of that story, but if true it would take some beating. In densely-populated urban districts it was undoubtedly right to have a fireproof wall continuing through the roof, but there could be no necessity for such a thing between a pair of labourers' cottages, which might be far away from any other building. In his opinion far too much was made of the danger of fire. As a matter of fact, the sill of the bedroom window of a cottage was seldom more than 12 ft. from the ground, and persons could easily drop from that on to the ground. But in addition the word "fireproof" was quite a misnomer, because in numerous cases structural timbers were allowed to run through the walls. The walls were a source of expense; it was serious in the case of a plain square built cottage, and much worse if the cottages for convenience or picturesqueness were built in other forms and shapes. He felt also that the by-laws had a tendency to destroy the beauty of rural England, for very many ugly buildings had their origin under them. One of the most picturesque style of cottages, all people would agree, was the half-timbered cottage; but that, he was told, was absolutely prohibited by some building by-laws. Then, again, in many country districts they were required to deposit copies of drawings with the district surveyor, although the deposit of plans had never been the practice in London. These drawings were expensive to the builder and owner, and served no useful purpose, and it was hardly fair on the ordinary practising surveyor that these plans should be in the keeping and at the service of the district surveyors, many of whom took private practice. He was inclined to think that district surveyors and inspectors of nuisances should be whole-time men. He agreed with what had been said on the subject of roads. Could anything be more unreasonable than that a road should be 36 ft. or 40 ft. wide which was a continuation of a road half that width or where the road led into an old road of far smaller proportions? As regarded sanitary matters, no doubt great benefit had been derived, but there was now a tendency to exaggerate the requirements of many districts. He had lately had a case in point. He had just completed a new road down which ran a sewer from 11 to 14 ft. in depth. The plots in the road were not more than 18 to 20 ft., and were for small houses, and yet the district council insisted on having eyes put into the sewer for every plot. He would do the district surveyor the justice to say that he did not approve of the order, but the council insisted, and he had been obliged to make the sewer, as it was part of a scheme with another landowner in which the district council were themselves taking part. When the new model by-laws of the Local Government Board came out there was great rejoicing, but the period of rejoicing was small. It was soon found that the new model by-laws were simply for the guidance of those authorities who had not framed by-laws, and that they were not intended to supersede the by-laws which were already in existence. No doubt if there was an appeal tribunal against the

unreasonable demands of local authorities it might have a tendency to keep these authorities in check. A tribunal limited to important points might be constituted in the manner which had been suggested in the papers, and this, combined with a uniform set of reasonable by-laws to be adopted throughout rural England, would be conducive of much good, and would be of great benefit to the rural working classes. He did not know whether he would be in order in moving a resolution, but if so he would like to move: "That the Council take some action either alone or in co-operation with the Royal Institute of British Architects for pressing upon the Local Government Board the importance of such revision of the local by-laws as would remedy some of the evils and hardships so frequently complained of, especially in rural districts, as tending to discourage the efforts of landowners and others to improve cottage accommodation on their property."

The Chairman said it would not be in order to move that as a resolution.

Mr. Smith said he would put it as a suggestion to the Council coming from a private individual. It was a matter of real importance to the country that the by-laws should be made uniform.

Mr. MacMorran, K.C., said he dealt rather with the construction of the building by-laws, and he found himself largely in agreement with the statements made in the papers. The idea of by-laws as he understood by-laws was this—it was a form of legislation relegated to the local authorities, who were entrusted with certain powers in respect of matters which were peculiar to their locality. In so far as matters related to a community generally there should be one code and one legislation for the whole. He did not mean to say there should be one code equally for urban and rural districts, but there were certain matters on which they all agreed which should pass into legislation, leaving by-laws to deal with matters of local peculiarity and interest. It seemed to him that they had outgrown the need of by-laws for all purposes connected with new streets and buildings, and the time had come when they should have a building Act capable of being understood by everybody, with perhaps power to the local authority to have this varied by by-laws where the necessities of the locality required it. That would give a certain elasticity and at the same time it would afford a general certainty, which, of all things, was important in matters of this kind. The by-laws did not date from 1875, but they were made under the Public Health Act of 1848, when they knew little about these things, and the time had come when a general consideration of the whole subject was urgently required. As things stood now, by-laws were supposed to be made for urban districts, and he agreed that a mistake had been made hitherto in granting the rural districts the same by-laws that up to this time had been in force in urban districts. Still, the rural councils could not get these powers without the consent of the Local Government Board, and it had to be remembered that some of these rural districts were only rural so-called. Take Croydon, for instance, where in the rural district there was a population of more than 30,000 people, and where the by-laws required to be equal to those of urban districts. The fault he found with the model by-laws as they stood was that they had made no progress for years. Faults and flaws had been found in them, but no attempt had been made to put them right, and once a by-law was made there was no means of altering it except on the initiative of the local authority itself. Mr. Stenning had pointed out that there was no definition of a new building, and surely that was a matter which required to be put right. Then the by-laws said every person must make a new road 36 or 40 ft. wide, but if a landowner built fronting on an old country lane he could build right up to the road. Then, again, if a man made a new street he was required to provide at one end of it an entrance equal to the width prescribed for the new street. That was a very ambiguous by-law, and its meaning had been left in great doubt by the legal decisions. He believed it meant the width of the street where it opened on to another road, but others said the entrance was the means by which they got into the street, and if that was so it would be impossible to make a new street opening into a street of less width unless they widened the street into which it opened. He felt that the whole of the by-laws from beginning to end required revision by professional experts who knew where the shoe pinched, and that there should be something in the nature of a

building code which could easily be agreed upon by a committee of the Institution, the Royal Institute of British Architects, and the Engineers. The Local Government Board had always set its face against allowing a local authority to dispense with its own by-laws, and this had led to great hardship; but still they could recognise that to give the local authorities dispensing powers might lead to abuses which it was desirable to avoid. There was a simple remedy, however, for that, which was to have, as Mr. Stenning suggested, a tribunal following on the lines of the London Tribunal, whose decisions they all respected. They might easily have half a dozen such tribunals for different parts of the country, and the decisions of the local authorities might be reviewed by these impartial and responsible tribunals.

Mr. Eve said that the only flaw in Mr. MacMorran's suggestion was as to appeal. Of course, if the local authority did not exercise its power in favour of the applicant the applicant would appeal, but who was to appeal if the local authority favoured a particular applicant? Although he agreed that some revision of the by-laws was necessary he hoped they would not go to the other extreme and make them too lenient. For instance, there seemed a tendency to narrow the width of streets, and to that he was entirely opposed, for they knew now the enormous cost of widening narrow streets. He hoped, therefore, if there was to be a change from the 36 ft. street it would be in the direction of increasing the width rather than decreasing it. Mr. Stenning had referred to the difficulty of knowing what was meant now by the width of streets, but it seemed to him that the Act was quite clear. The reason why it was stated that footpaths should be on both sides of the street was to prevent some cantankerous man putting both footpaths on one side. He had had to deposit plans in rural districts, but it was somewhat different to London, where the district surveyor was always accessible. As to the suggestion of the local surveyor making use of the plans, he could do that by observation of the buildings if he liked. He certainly thought there should be some definition of a new building. He was a strong advocate for the omission of the party wall through the roof, and he felt that they were too much afraid of fire. To talk of fire being dangerous in houses of two floors appeared to him to be absurd, and party walls through the roof added materially to the expense, and also added to the chance of water coming through the roof. In addition their omission certainly added to the appearance of a row of cottages. Where old roads were brought in for building purposes there should be some requirement for them to be widened.

Mr. H. J. Elwes said that the discussion had been brought about by the action of Sir W. Grantham. His experience of rural councillors had not been so bad, and they did not make objection to any reasonable infringements of the by-laws. Some time ago he had the misfortune to own some cottages in a cathedral town in the south of England. People had lived in those cottages for generations and brought up large and healthy families in them. A new man came on to the council and began to attack the landlords. He told the council that if he was expected to put those cottages into what was called modern repair he should burn them down. The council took no action. He had had experience of living in wooden houses, but architects and builders seemed to ignore the fact that wooden houses, which were healthier than many of the brick-built houses, could be built, and that if built in the right way they were durable. He had lived in an oak-built house in Massachusetts which was built in 1704, and had never had a coat of paint on it, and it was sound and weather-tight to this day; while in Switzerland he lived in a house built of larch logs more than 400 years old. It appeared to him that building by-laws were not necessary at all in ninety-nine cases out of a hundred, although there might be some power given to local councils to condemn houses which were obviously insanitary. If they could give the utmost liberty to landlords consistent with decent sanitation it would encourage them to build modern houses, and it would encourage builders to use English timber, which they did not do at present. He had offered a prize for the best plan and specification of a cottage to be exhibited at the Garden City Show in August, and would be pleased to give his ideas, which were based on experience in Japan, America, and many parts of Europe, where he had lived in wooden houses, and would like to do again.

Mr. Done said that no doubt in rural districts which were in reality urban districts there were considerations which applied which did not enter into his own professional practice, and which scarcely touched the question of rural housing. The number of such places was comparatively small, but outside of them was an enormous part of the country which was regulated by by-laws of the most drastic character and where many things were provided which could not possibly happen. Speaking of purely rural districts, the question of road-making did not apply. They never made any roads, and probably never would, and by-laws as to road-making never entered into the practice of a purely rural land agent. They had got into a muddle on this question, and it was difficult to say who was responsible. It was quite true that those composing rural councils were not as a rule qualified to make by-laws, but he knew a case where the local authority, feeling themselves unqualified to frame by-laws, asked the land agent of a well-known nobleman in the neighbourhood to draw them up, and that gentleman framed the most extraordinary set of by-laws he ever saw. He had a case where he was building a pair of cottages, and he gave 18 ft. by 10 ft. for the bedroom, and he was told that it would not meet the requirements of the by-laws unless the rooms were reduced to 14 ft. by 10 ft. In the end the local authority withdrew at it, and he built the cottages. He had read in several responsible journals which were commenting on the case of Sir William Grantham that the whole trouble arose from landlords trying to get out of their responsibilities. It was not, however, a landlords' question. They did not build these cottages for fun but for profit, and if they could not build them on reasonable lines it was perfectly clear that they would not build them at all, and the unfortunate people who wanted houses would suffer. He did not think, however, that it was the poor people themselves who wanted these drastic requirements, and so far as he was concerned he would be perfectly willing to leave it to the workpeople themselves. Agriculture was a business in which the margin of profit was small, and it was, above all, a business of temporary expedients, and if they were to come down with regard to their buildings in the way many of them were they were being placed in an impossible position as compared with their competitors on the other side of the water. He knew a case where he supplied a farmer in Middlesex with fencing materials, and, on visiting that man afterwards, he found he had built an addition to two cottages, giving him two extra bedrooms, which were used when the harvesting season was on. That man had actually used the fencing rails for joists. He told him it would not do to dance in the rooms, and the farmer said, "We do not want to, and that was the whole question." He endorsed Mr. MacMorran's idea of an appeal tribunal, but he felt that if district surveyors were all to be a dispensing power their position would be intolerable. He believed that a code such as advocated by Mr. MacMorran would largely get rid of their difficulties, but what he would place great value upon was the setting up of some tribunal of appeal which would give a decision which would carry weight and save sensible men.

Mr. Reed (Building By-laws Reform Association) remarked that if they were to have a remedy for the present state of affairs it must be by legislation. There were 1,100 odd urban councils and 666 rural councils, and in ten years the Local Government Board took credit for having passed over 1,200 sets of by-laws. If they had a perfect code to-morrow how were they going to get it put into practice? If they were to wait until the whole of these districts adopted new by-laws they would have to wait for many years. He considered that a Bill containing a few provisions amending the Public Health Acts would do what was required. Mr. Williams said he was associated with the National Workmen's Housing Association, which was composed of men who wanted decent, commodious houses. This agitation had gone on for some months, and really resolved itself around the question of good houses for workmen. Without desiring to impinge anything, he was forced to ask whether the agitation was quite sincere. By-laws had been adopted in about half the rural districts in England, and if the agitation was sincere why was there not a revival of house-building in those districts where there were no by-laws? He went at

Shire and found villages where the cottages were allowed to fall into disrepair, and where to new cottages were built, and the inhabitants had to go away to the towns. As an architect I found no difficulty with by-laws because I hoped everyone in the profession was above by-laws. It was said that the by-laws prevented the building of good houses, but he owned issue there. It was impossible to prevent the building of good houses, because they knew that many bad houses were built. What was the reason for all the trouble? It was to be found in the remarks which fell from Sir W. Gunton before Mr. Long, Sir W. Gunton, the Mr. Wilfrid Blunt, desired to build cottages without interference from the district councils. He did not say that Sir W. Gunton would build an unhealthy house, but if he was allowed to build without interference the result would be that others would come along who would build unhealthy houses. The trouble Mr. Stenning had was not so much with the by-laws as with those who administered them. On this question of representation, however, if builders were not to be on local authorities then neither architects nor surveyors should be members. He was astonished that Mr. Stenning should suggest narrow roads, and so far as the deposit of plans was concerned, it was a small matter. He hoped that whatever was done in the way of amending the by-laws it would result in good houses only being built.

Mr. W. Woodward said he would like to assure Mr. Williams that they in that room were perfectly sincere in trying to amend the by-laws in a manner which would result in benefit to the working classes. There was no desire to have any jerry building or unhealthy dwellings, but they desired to erect the cheapest possible dwellings for the benefit of the men whom Mr. Williams represented.

Mr. Williams said he did not suggest that the Institution was not sincere, but the agitation was.

Mr. Hudson suggested that, as many others could like to speak, and the hour was late, they could be invited to send their views in writing to the secretary for publication.

The Chairman said if there was a desire on the part of many members present to speak on the subject, the discussion could be adjourned.

Mr. Woodward moved, and Mr. Hudson seconded, the adjournment of the discussion till the next meeting, and this was agreed to.

PORTLAND CEMENT.

On Wednesday evening, at No. 9, Conduit-street, W., before the members of the Builders' Ormen and Clerks of Works' Provident Institution, Mr. H. K. G. Bamber (managing director of the Associated Portland Cement Manufacturers, 1900, Ltd.), read a paper entitled "Some Notes on the Modern Manufacture of Portland Cement and Practical Testing hereof." Mr. John Beer presided.

Mr. Bamber, after referring to the well-known history of the invention of Portland cement, said that the old process of mixing together chalk and clay in definite proportions was a difficult matter when it was remembered that it was only in recent years the assistance of the trained chemist had been utilised to select the composition in the early stages of manufacture. For many years the consumer, knowing little or nothing of the material he was using, was entirely in the hands of the manufacturer as to the description of cement supplied, and no doubt, this monopoly with the manufacturers of what knowledge there was on the subject was the cause of this great industry remaining for so many years unenlightened and following the initiatory unscientific practices of its infancy. The development of research and the carrying out of properly-organised investigations into the manufacture of properties of Portland cement, more especially in Germany and America, compelled the English manufacturer, who had been somewhat tardy in this direction, to set about bringing his works in order and remodelling them on scientific lines. The extension of knowledge of the subject soon resulted in the more calcareous and silicious materials being experimented with for the manufacture of cement, and in many cases materials other than chalk and clay had been found suitable for proper methods of manufacture for the purpose, with the result that works had sprung up in various parts of the country, but in no case were the materials so eminently adapted

for the manufacture of the best quality of Portland cement as the chalk and clay found in the cradle of the industry on the Thames and Medway. Another result of the more general knowledge of the subject was the framing by the consumer, or rather by his architect or engineer, of many and various specifications, whereby his intention was to insure the provision for himself of a cement having certain qualities and peculiarities which conformed to his own ideas on the subject. It could readily be imagined how the difficulties of the manufacturer had in this way been increased; but, fortunately, the matter was now having the attention of the Cement Section of the Engineering Standards Committee, and it was hoped that, as the results of their deliberations, a standard specification of the quality of cement, together with details as to the methods to be employed for testing the same, would be shortly compiled and published, to the mutual advantage of the consumer and the manufacturer. Mr. Bamber proceeded to describe the various processes of the more modern manufacture adopted at the works of his company, and illustrated his remarks with a series of cinematograph pictures and lantern slides which represented the actual working at the Associated Portland Cement Company's works. To get the materials mixed in exactly the proper proportions there is a most careful and continuous system of sampling and analysis, the chemists taking samples every fifteen minutes. The next important step was to see that the materials were thoroughly amalgamated, and in modern cement plants so perfectly is this part of the operation carried out that at least 96 per cent. of the chalk and clay delivered to the mixing and grinding mills is capable of passing through a sieve having 32,400 holes per square inch before it is delivered by the mill for conveyance to the storage mixers. The second part of the process was the calcination, generally carried out by the rotary kiln, and the third process was the reduction to powder of the cement clinker, which was obtained by means of several classes of machinery all of a heavy and powerful kind, necessitated by the extreme hardness and refractory character of the material to be pulverised. Proceeding to the question of testing, Mr. Bamford gave the following analysis showing the chemical composition typical of the bulk of cements in use:—Silica, 22.00; insoluble residue, .75; alumina, 7.60; ferric oxide, 61.90; magnesia, 1.25; sulphuric anhydride, 1.50; carbonic anhydride, .25; water, .75; potash, soda, and loss, .45; total, 100.00. It was customary with a high class of Portland cement to grind to very great fineness, but in making a test care must be taken to see that the sieve used was made of correct standard wire. The test of specific gravity had superseded the "weight per bushel" and was a much more reliable test. It was not affected by the fineness of grinding, which destroyed entirely the weight per bushel test. This test was applied as a measure of the calcination to which the cement had been subjected, as should there be any considerable proportion of under-burnt or lightly combined clinker present in the cement, which would be likely to cause unsoundness, the specific gravity would fall below 3.125, which was taken approximately as the standard for well-burnt cement. The cement supplied by a manufacturer to a required setting time might vary considerably in its setting characteristics in accordance with the amount of aeration to which the sample was subjected, and this unavoidable variation, due to atmospheric causes, was a fruitful source of trade disputes. The cement should as far as possible be tested as received. The method of testing the setting time most in favour was that of the use of a weighted needle having a point 1.16th in. square and weighing in all 2½ lbs. In gauging the pat for this test sufficient water should be used to produce a plastic mass, but care must be taken not to use an excess of water. Much had been written about the tensile strength, and in the hands of the expert there was little difficulty in conducting this test, but in the hands of the novice the reputation of the manufactured article was everlastingly trembling in the balance. He emphasised the necessity of seeing that the apparatus and tools are clean and suitable, and that the moulds for making the briquettes should be clean and thoroughly free from excess of lubrication; neat cement should be taken in weighed quantities;

the water, thoroughly clean, always measured; and the briquettes always made singly. For sand tests none but the standard Leighton Buzzard testing sand should be used. The test for soundness was perhaps of more importance than any other test to which cement was subjected, and the tests consisted chiefly of exposing a set cement to various high temperatures in water in order to hasten the ultimate results likely to be obtained under various climatic conditions. Many tests of a more or less stringent character had been introduced, the most severe being the boiling test. There are various methods of carrying out this test, but the most rational and severe is that known as the Le Chatelier method. It was the most stringent test for soundness in use, and had an advantage over all other tests, which only recorded expansion without any means of measuring the amount of same. It erred, however, on the side of severity, as thousands of tons of cement manufactured in the past—which had resulted in splendid work—and much cement that might be manufactured in the future, which might also do good work, would fail to pass this most stringent test. Cement, however, that would pass this test would pass any other of the many hot tests known to the trade, and must of necessity be of a high-class character, thoroughly well manufactured, and such that would give satisfaction under any normal conditions. It was cement of such description that it was the aim of the British manufacturer to produce.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday, in the County Hall, Spring-gardens, Mr. J. Williams Benn, M.P., Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed that the following loans be granted:—Canterbury Borough Council 11,540*l.* for erection of lodging-houses; Deptford Borough Council 5,000*l.* for property for housing purposes; Hammer-smith Borough Council 18,482*l.* for electric lighting purposes; and Southwark Guardians 4,500*l.* for sanitary work at Champion Hill Infirmary. Sanction was also given to the following loans:—Hackney Borough Council 2,160*l.* for electric light purposes, etc.; Hampstead Borough Council 5,075*l.* for paving stoneyard; St. Pancras Borough Council 20,000*l.* for purchase of property under Part II. of the Housing of the Working Classes Act, 1890.

Drains of Non-Provided Schools.—The Education Committee reported that the Council, on December 13, 1904, sanctioned an expenditure of 850*l.* in connexion with the investigation of the condition of the drains in the non-provided schools, and the Committee now reported that, in pursuance of this resolution, active steps are being taken to proceed with the work. A letter (January 12, 1905) had also been received from the Rochester Diocesan Board of Education as follows:—

"I yesterday saw Mr. Bailey, the architect of your Education department, and desire to repeat in writing the representations which I then made to him orally with reference to the examination of the voluntary schools in the London area, now proceeding. Your Council is probably aware that the borough councils claim that they (acting through the medical officers of health) have primarily the sole right to test drains within their respective areas. While I would assure your Council that the managers of the Voluntary schools of South London desire that the sanitary arrangements of their schools should not be only perfect, but beyond suspicion, I desire to point out that those managers must be assured that they are obeying the right authority before they can be expected to spend money on altering or reconstructing their drains. As the matter stands, the medical officer of health claims that he has sole primary jurisdiction in this matter and that his certificate of soundness is a complete protection. May I be informed whether the proceedings being taken by your officers are intended to be under the Education Act, 1902, or the Public Health Acts? The question is important. We have counsel's opinion that the power to inspect the school given to the local education authority by the Education Act, 1902, does not justify any physical interference with the drains. On the other hand, the Public Health Acts in London require that twenty-four hours' notice of the proposed examination should be given. It is contended by the managers of some schools that the action of the officers of the Council in opening drains without notice and without the authority of the medical officer of health, is distinctly *ultra vires*, and that they will be entitled to recover for any damage caused thereby. It seems difficult to dispute this contention, especially where the managers are further protected by the certificate of the medical officer of health that the drains are sound. Apart from the legal aspects of the question, I am instructed to suggest to your Council that where so important a matter as the drainage of a school is concerned, notice given to the persons concerned before any examination is made would tend to the smooth working of the Act."

The Committee reported that they had arranged that due notice shall be given to managers of the date when the Council's officers propose to visit non-provided schools to inspect the drains, and they recommended:—

"That the Secretary of the National Society, the managers of the under-mentioned non-provided schools, and the Secretary of the Rochester Diocesan Board of Education be informed that the drains of all non-provided schools are being inspected by the Council's inspectors in pursuance of the resolution of December 13, 1904, and that this work forms part of the general survey; and that arrangements have been made whereby due notice shall be given to the managers of the date when the Council's officers propose to visit the schools to inspect the drains."

Mr. Whitaker Thompson moved that the following words be inserted in the recommendation, i.e., that in cases in which the managers can show that their schools have been inspected and drains tested by the local sanitary authority during the last twelve months, the Council will be satisfied if the requirements therein made have been complied with.

Mr. Hunt seconded, but on a division the amendment was lost, and the Committee's recommendation was agreed to.

Hoborn to Strand—Gaiety Theatre Company.—The Improvements Committee brought up the following report:—

"It is provided in an agreement between the Council and the Gaiety Theatre Company, dated May 6, 1901, supplemental to the agreement dated June 28, 1899, referred to in the Council's Improvements Acts of 1899, that the company shall build upon the site therein referred to a new theatre according to plans, elevations, etc., to be approved by the Council, and further, that if the Council shall require such elevations or any of them to be of a different and more elaborate or more costly character, design, or materials, the company shall comply with the Council's requirements on condition that the increased cost, if any, thereby entailed shall be paid by the Council. We have now to report that Mr. A. T. Franklin, of the firm of Messrs. Franklin & Andrews, quantity surveyors, the arbitrator to whom the matter was referred, has awarded that the requirements of the Council did properly entail on the company increased costs, and that the amount of such increased cost is £7,217. This amount, together with the costs (£164. 7s.) of the arbitrator in making his award, is, in accordance with the agreement, payable by the Council, and we have therefore forwarded the accounts to the Finance Committee with a view to payment being made. The company may add that the company's claim amounted to £23,000."

Mr. Hunt said the figure was an appalling one, as it was only for the embellishment of the building, so, as it was said, to make it worthy of the site. As regards the architectural features of the theatre, he did not wish to indulge in any comments, beyond saying that he did not regard it as a thing of beauty and a joy for ever, and if nearly £8,000 had been expended on architectural improvements, he failed to discover the point where it could be shown on the building.

Mr. Davies, the Chairman of the Committee, in reply, said the point was that this was not letting land to the Gaiety people whereon to build a theatre, but it was the purchasing of the company's interest in the old theatre and the land on which it stood, and re-instating them in a new site.

There was a feeling both inside and outside the Council that the class of property to be erected on this site should be worthy of London. The Council was not in a position to compel these people to put up a building that would be a credit to London, but they had succeeded in doing so by the means reported on by the Committee.

The subject then dropped.

Water Supply to Tenement Houses.—The Public Health Committee brought up a report dealing with the water supply to tenement houses, as follows:—

"On May 10, 1904, we brought to the notice of the Council the report by the medical officer of health as to the result of an inquiry by Dr. Young respecting the sanitary accommodation in houses originally built for one family, but now let in separate tenements to several families. One of the important facts disclosed in that report was the inadequacy of the arrangements for the supply of water to the tenants of the upper floors in such houses: there being in many, if not most, of such houses but a single tap, and that in the basement or on the ground floor. The supply of water to inhabited houses is regulated by the provision of sections 2 and 48 of the Public Health (London) Act, 1891. Section 2 provides that, where there is a continuous supply of water, the absence from premises of water fittings shall be a nuisance liable to be dealt with summarily under the Act, and section 48 (1) provides that 'an occupied house without a proper and sufficient supply of water shall be a nuisance liable to be dealt with summarily under this Act, and if it is a dwelling-house, shall be deemed unfit for human habitation.' We were doubtful whether these provisions were sufficient to enable sanitary authorities to require a supply of water to the tenants of each floor in tenement houses, and on June 14, 1904, the Council decided to promote legislation on the subject, but its resolution was subsequently rescinded on December 6, 1904, as the Parliamentary Committee reported that they were advised that it was by no means clear that the present law was sufficient to meet the case, and as we were endeavouring to get the matter tested at the

instance of one of the metropolitan borough councils. We are now glad to report that on December 16, 1904, as the result of proceedings by the Woolwich Metropolitan Borough Council respecting the water supply of a tenement house, No. 1, High-street, Woolwich, the magistrate decided that the supply of water from a tap in the yard was not a proper and sufficient supply within the meaning of section 48 of the Public Health (London) Act, 1891, and he made an order to abate the nuisance, and ordered the defendant to pay 5s. costs.

Dr. Hamer, the Council's assistant medical officer of health, gave evidence supporting that given by the medical officer of the borough council, and the following extracts from the proof of Dr. Hamer's evidence show the conditions which he found on visiting the premises in question on December 13, 1904:—

'The house is a three-story house; a single man occupies the ground floor rooms. A woman and her child occupy the first floor front room; the first floor back is separately let. In the top floor front there are a man and wife and two children (one of the children is, however, not always at home), and in the top floor back there is a single man. The only appliances for supplying water for domestic use to the occupants of these five sets of tenements is that situated in the back yard of the house. All water for cooking, drinking, personal ablution, washing clothes, and scrubbing floors has to be fetched from the yard; there is no wash-house, and the copper in the yard is in a dilapidated condition.

The tenants of the top floor store water in a pail, which is kept on the landing at the top of the staircase; this staircase is very dark and the pail is uncovered, and water stored in this manner is liable to become polluted.

The conditions as regards cleanliness of the rooms and staircase are unsatisfactory, and this is not surprising, having in view the need of carrying water from the yard all the way upstairs.

The case is an important one, and we think that the attention of all the metropolitan borough councils should be called to it. We therefore recommend that a letter be addressed to the metropolitan borough councils calling their attention to the decision of the magistrate at the Woolwich police-court on December 16, 1904, to the effect that the supply of water from a tap in the yard is not a proper and sufficient supply within the meaning of section 48 of the Public Health (London) Act, 1891, and expressing the Council's hope that they will take all possible steps to secure the provision of a proper and sufficient supply of water for the tenants of every floor of a tenement house."

The recommendation was agreed to without discussion.

By-laws Under Section 39 (1) of the Public Health (London) Act, 1891.—The same Committee reported that the Local Government Board has confirmed the amended by-laws made by the Council on November 8, 1904, under section 39 (1) of the Public Health (London) Act, 1891, with respect to water-closets, earth-closets, privies, and receptacles for dung. These by-laws include a requirement as to the number of water-closets which must be provided in proportion to the number of inmates of houses let in lodgings or occupied by members of more than one family, and, having regard to the decision of the High Court (King's Bench Division) on December 9, 1903, in the case of *Nokes & Nokes v. The Mayor, Aldermen, and Councillors of the Metropolitan Borough of Islington*, a proviso has been added to the effect that proceedings shall not be taken in respect of failure to provide and maintain the required number of water-closets unless and until the owner of the lodging-house has been served with a notice in writing by the sanitary authority and has not complied with the by-laws in question within the time specified in the notice.

The Council adjourned soon after seven o'clock.

Fifty Years Ago.

INCREASED FACILITIES AT LONDON BRIDGE.—A correspondent, Mr. M. T. O'Keefe, C.E., suggests the formation of a superway for foot passengers across London Bridge, based on two rows of columns, 15 ft. high and 30 ft. apart, and so distributed as to divide the slow from the quick traffic below, while also supporting the transverse and longitudinal girders on which the superway would be laid, and which could be ascended to by some thirty easy steps. The railway foot traffic, he further suggests, might be provided with a continued superway, leading into or out of the railway terminus. The same suggestion might apply to Waterloo Bridge. So far from being unsightly, our correspondent remarks that it might be made, in the opinion of many, ornamental (as a *Rialto*), rather than otherwise.—*The Builder*, February 3, 1885.

APPOINTMENT OF SANITARY OFFICERS.—The Local Government Board has sanctioned the appointment of Miss M. M. Pole as an additional sanitary inspector in the City of London, and has also sanctioned the re-appointment of the undermentioned sanitary inspectors in the City of Westminster:—Miss C. W. Byrne, and Mr. A. L. Ware.

Illustrations.

WEST FRONT, BEVERLEY MINSTER.

THE illustration of the west front of this well-known church is from another of the fine drawings made by Mr. J. B. Fulton in the course of his sketching tour as holder of the Royal Academy Studentship in Architecture.

UNIVERSITY COLLEGE SCHOOLS, HAMPSHIRE.

WE give this week a reproduction of the perspective view of Mr. Arnold Mitchell's design for the proposed new University College School at Hampshire, which received the first premium in the recent competition, and is, we presume, to be carried out.

We gave the plans, elevations, and sections, and the architect's description, in our last issue.

SECTION OF S. IRENE, CONSTANTINOPLE.

THIS section of S. Irene, Constantinople, is given as an illustration to our leading article of this week, in which reference is made to it. It is also referred to in the discussion on the papers read at the Architectural Association, and reported in another column.

METROPOLITAN ASYLUMS BOARD OFFICES: PRINCIPAL ENTRANCE.

OUR illustration shows the entrance to these offices. The main entrance-hall is at the corner of the Embankment and Carmelite-street, the entrance-door being flanked by two circular turrets, which in the hall form bay windows.

Immediately through the hall is a marble staircase with a centre flight of steps branching right and left to the first floor, one side leading to the large board-room, the other to the committee-rooms.

The approach from the pavement to the entrance is through a pair of wrought-iron gates forming part of the general enclosure of the site.

The iron work was made by Messrs. Avery, Downey & Co., from designs and full size prepared by the architect, Mr. Edwin T. Hare. The stone carving shown on the building was done by Mr. C. H. Fehr.

GATES, WORSLEY HALL.

THESE gates have recently been erected at the new entrance to Worsley Hall, near Manchester, for the Earl of Ellesmere. They have been entirely executed from my design by Messrs. George Wragge, of Salford, Manchester, who also made the gearing by which they are opened from the lodge.

F. FORBES GLENVILLE.

OLD LEAD SPOUT HEADS, BOLTON HALL.

THESE spout heads were made and fixed in 1678, for Charles, Marquis of Winchester, the first Duke of Bolton.

On October 15, 1902, Bolton Hall was destroyed by fire, but though somewhat damaged and in a bad state of repair, these heads were found to be re-usable, and were therefore placed by the architect (Mr. C. Hodgson Fowler) in the hands of Mr. J. Alfred Hunt, art leadworker, Hoddesdon, for restoration, and, together with their respective fall pipes, they have been refixed on the rebuilt building.

The coats-of-arms are those of the Marquis of Winchester and those of the Marchioness, who was a daughter of the last Lord Scrope of Bolton, and the combined arms of the two families.

The photographs were specially taken for the owner, Lord Bolton, by the clerk of works, Mr. John Holden, prior to their being refixed.

INTERNATIONAL SOCIETY OF SCULPTORS, PAINTERS, AND GRAVERS.—Owing to the amount of work entailed in arranging the Whistler Memorial Exhibition, the Council of the International Society of Sculptors, Painters, and Gravers has decided to close their exhibition, now open in the New Gallery, on Saturday evening, February 11. The exhibition of the works of Whistler opens to the public on February 22.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Hammersmith.—A block of residential flats adjoining (eastward) No. 30, Goldhawk-road, Hammersmith (Messrs. Leslie & Co., Ltd.).—Consent.

Hampstead.—Six buildings upon a site abutting upon the south-western side of Finchley-road and northern side of Lymington-road, Hampstead (Mr. W. F. Cave).—Consent.

Lewisham.—A library building on a site abutting upon the east side of Brookley-road, and south side of Darfield-road, Lewisham (Mr. A. L. Guy for the Libraries Committee of the Council of the Metropolitan Borough of Lewisham).—Consent.

Kensington, South.—Stone entrance steps and an iron and glass covered way at No. 81, Holland-park, Kensington, to abut upon Holland Park-avenue (Messrs. Rawlings Brothers, Ltd., for the executors of E. Radford).—Refused.

Wandsworth.—Buildings, with one-story shops in front, upon the site of Nos. 207, 209, and 213, Balham High-road, Wandsworth (Mr. E. Schneider for Messrs. W. Wallis, J. A. Mullins, and F. J. Pettit).—Refused.

Width of Way and Line of Frontage.

Kensington, South.—The retention of a concrete platform on the east side of Malvern House, No. 29, Holland Park-avenue, Kensington, at less than the prescribed distance from the centre of the roadway of Aubrey-road (Mr. C. W. Boswell for Mr. G. Pidduck).—Consent.

Width of Way, Line of Frontage, and Space at Rear.

Bow and Bromley.—A one-story building at the rear of No. 21, Devons-road, Bromley, to abut upon Bruce-road (Mr. G. Lewis for Dr. B. Hogan).—Consent.

Line of Frontage and Construction.

Finchley, Central.—Three iron gangways to connect at the first, second, and third floor levels Nos. 67, 68, and 69, Turnmill-street, and No. 3, Printers-buildings, Broad-way, Finchley (Mr. R. A. Jack for Messrs. R. S. Murray & Co.).—Consent.

Fulham.—A shed at the side of No. 59, Langborne-street, Fulham, to abut upon Wood-lawn-road (Mr. T. Cooper for Mr. Hedges).—Refused.

Space at Rear.

Kensington, South.—A modification of the provisions of section 41, so far as relates to the proposed erection of buildings upon a site abutting upon the east side of Hornton-street and south side of Holland-street, Kensington (Messrs. Clifton & Sons for Mr. W. A. Daw).—Consent.

Means of Escape from the Top of High Buildings.

Westminster.—Means of escape in case of fire, proposed to be provided in pursuance of section 53 of the Act, from portions of the stories, the upper surfaces of the floors of which are above 60 ft. from the street level, of a building abutting upon Millbank-street, Wood-street, Great College-street, and Little College-street, Westminster, for the persons dwelling or employed therein (Mr. W. D. Jacob).—Consent.

Finchley, East.—Means of escape in case of fire, provided in pursuance of section 53 of the Act, on the fifth (topmost) story of Nos. 2, 14, Clarence-street, St. Luke, the upper surface of the floor of which is above 60 ft. from the street level, for the persons dwelling or employed therein (Messrs. Salmon & Luckstein, Ltd.).—Consent.

Deviation from Certified Plans.

Strand.—Deviations from the plan certified by the District Surveyor, under section 43 of the Act, so far as relates to the proposed re-erecting of Nos. 30 and 31, Duke-street, rearly, with projecting balconies at the second floor level (Messrs. Gordon & Gunton or Mr. F. Runchman).—Consent.

Stepney.—Deviations from the plan certified by the District Surveyor, under section 43 of the Act, so far as relates to the proposed re-erecting of No. 152, Commercial-road, and Nos. 2 and 4, Hessel-street, Whitechapel (Mr. F. K. Abrahamson).—Consent.

Formation of Streets, etc.

Kensington, North.—That an order be used to Messrs. Trant, Brown, & Humphreys, sanctioning the formation or laying out of new streets for carriage traffic on the St. Quintin estate to lead to St. Quintin-avenue, High Lever-road,

and Latimer-road, Kensington (Mr. W. H. St. Quintin).—Consent.

Camberwell, North.—That an order be issued to Mr. T. Wilson refusing to sanction the formation or laying out of a new street, for foot traffic only, in continuation of the portion, leading northward, of Elmington-road, Camberwell, and in connexion therewith the erection of three houses (Mr. J. Vanden Bergh).—Refused.

Islington, North.—That an order be issued to Mr. C. W. Calcott refusing to sanction the formation or laying out of a new street for foot traffic only to be used as a covered market, out of the south-west side of Highgate-hill, Islington (for Mr. J. W. Galton).—Refused.

Hackney, Central.—That an order be issued to Mr. C. Winkley refusing to sanction the erection of buildings on sites abutting upon the east and west sides of Priory-pace, Well-street, Hackney, and the widening of a portion of Priory-pace.—Refused.

Cubical Extent and Construction.

Rotherhithe.—Three iron lift enclosures, and an iron gangway, and an alteration to an existing gangway at premises on the northern side of Jacob-street, Mill-street, Bermondsey (Mr. W. T. Walker for Messrs. Spillers & Baker).—Consent.

Buildings for the Supply of Electricity.

Hammersmith.—A steel structure supporting the thermal storage tanks and coal bunkers, and the roofs thereto at the generating station, Fulham Palace-road, Hammersmith (Mr. H. Mair for Hammersmith Borough Council).—Consent.

The recommendations marked † are contrary to the views of the local authority.

ARCHITECTURAL SOCIETIES.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—On Thursday, the 26th ult., Mr. Thos. H. Mawson read a paper on "The Principles and Practice of Garden Making," Mr. G. B. Bulmer, President, in the chair. The lecturer said "that, although I have no wish to pose as an architect, yet I am deeply interested in all subjects that appertain to the house and garden, and also in the furnishing of the home. Candidly speaking, we all know how impossible it is for an architect to master technically the vast range of ever-increasing subjects that crowd into an ordinary town practice, and I find the same in my own sub-division of the profession, if I may so call it. Most part of our small gardens seem to lack just the one touch of regularity which is in accord with the house—in most cases a compact low hedge or a breadth of grass—touches which an architect should be able, from the nature of his training, to impart; for, when once the gardener is started upon right lines, he can maintain it, but the ambitions of the modern gardener are too much centred upon, and too much measured by, his abilities to compete in the flower-show exhibitions. After having enunciated guiding principles, I desire to lay special stress upon one very important branch of the subject of laying-out grounds—viz., the trees and plantations, the most important essential in imparting character and local colour to the environment of a home. At no time, if the scheme is to be successful, can we divorce the house and, in the strict force of the word, the gardens from the surroundings; all must be viewed together in unity. When there is perfect freedom of choice, the three great considerations in deciding upon the site and position of the house are:—Climatic conditions—that is, whether the prevailing character of the air is humid or dry; the nature of the subsoil, whether sandy, gravelly, or clay; and the aspect, for, no matter what the prospects offer, it is unwise to build upon the north, north-west, or north-east side of a hill or knoll. The nature of the subsoil is a point which needs more than ordinary caution. Beds of clay, though perhaps not so unhealthy, are cold and disagreeable, and difficult to drain by the natural process of filtration. For healthy beauty, luxuriance, and ultimate cheapness, select a site with an understratum of gravel or marl and a good surface covering of loam. With regard to surface soil for a flower-bed, it is a good plan to lay at a depth of about 2 ft. a layer of broken bricks, then to cover lay this with a covering of ashes, and then about 21 in. of soil of desirable lightness. For trees and shrubs, a depth of 1 ft. 6 in. or 2 ft., with a plentiful admixture of fibrous turf loam. Grass also requires a depth of soil not less than 8 in., with a well-drained bottom properly prepared." With the intent of showing the successive stages of the development of a scheme and the way

it gradually assumes shape, the lecturer showed on the screen three schemes with plans and photographs. In each case the lecturer was the designer of the gardens, but there was a free exchange of ideas and criticisms between the architect, client, and the lecturer. The first scheme was in Ashdown Forest, the second on Berkhamstead Common, and the third in Devonshire.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—A meeting of this Society was held on the 26th ult. in the Society's room, Leopold-street, Sheffield, when Mr. T. Winder presided, and a lecture was given by Mr. H. L. Paterson, A.R.I.B.A., on the "Geometrical Period" of Gothic Architecture. He began by pointing out that the fusion of the Saxons and Normans into one people and the gradual separation of England from France allowed each nation to pursue its own ideals, and the architecture of each to assume a national character. It was in ecclesiastical architecture that the greatest development took place, the monasteries being the only place in which men could be trained, and in which the large stores of wealth gave them the opportunity of exercising the artistic faculties by erecting noble buildings. By the beginning of the XIIth century the style known as Gothic was firmly established throughout Western Europe. This style, in which the greatest constructive skill was required, and in which the principle of elasticity was fully and consistently developed, contrasted with the architecture of the Greeks, in which dead height was the most marked characteristic. The practice of concentrating the thrust of a vaulted roof on large masses of masonry, the thrust being often carried across intervening space by flying buttresses, allowed the intervening wall to be largely dispensed with so far as any constructive purpose was concerned, and left it free to be utilised to the full for windows. These became larger and more elaborate, and the increasing use of coloured glass hastened the process. Tracery, the progress of which is the most characteristic feature of the geometrical period, had its germ in Romanesque and Byzantine times, and during the Norman and Lancet period which followed the evident desire to decorate the plain stone spandrels, as well as the desire for more light, led step by step to the piercing of the stonework. This took first the form of pierced plates, the stonework being reduced until it took the form of bars or mullions, until the common use of foliation or cusping and completely developed tracery was brought in. The lecturer showed some of the steps by which this development took place in vertical windows, and also in rose windows, and how eventually a traceried window included both types. The different kinds of cusping were noted, and also the change from a purely geometrical treatment to one in which intersecting bars and a combination of the two kinds led to the culmination of the style. Slides were shown also to call attention to the change which took place in the mouldings, and also in the ornament during this period, and the lecturer concluded by calling attention by means of slides to some of the differences between English and Continental work.—On the motion of Mr. W. G. Buck, seconded by Mr. W. Potts, and supported by Mr. H. Wilson, Dr. Wilkinson, Messrs. W. J. Hale, J. R. Wigfull, and E. M. Gibbs, a vote of thanks was accorded the lecturer. The lecture was illustrated by lantern slides exhibited by Mr. J. Atkinson, of University College.

WOLVERHAMPTON ARCHITECTURAL ASSOCIATION.—The annual meeting of the Wolverhampton and District Architectural Association was held on Thursday, the 25th ult., at the Law Library, Lich Gates, Wolverhampton, when the following officers were elected for the year 1905:—Mr. Fred T. Beck, President; Mr. W. Edwards, vice-president; Messrs. S. H. Eechus (London), T. H. Fleeming, and J. Lavender, members of council; Mr. J. Harrison Weller, hon. treasurer; Mr. A. Eaton Painter, hon. auditor; and Mr. W. J. Oliver, Darlington-street, Wolverhampton, hon. sec. At the conclusion of the business of the meeting the President delivered his annual address to the members. In the course of the address the President dealt at some length with the objections to the employment of official architects and surveyors to carry out work for municipalities which ought rather to be placed in the hands of architects who are in general practice. We are most strongly of the same opinion; official architecture, unless in some exceptional cases where

a municipality has succeeded in engaging a man of architectural genius as an official (which does not often happen), almost always tends to become commonplace and mechanical in character; moreover, it is a hardship to outside architects that men who are in the enjoyment of fixed positions and salaries should be, as it were, taking their work from them. At the same time we cannot but feel that it is a delicate subject for architects and architectural societies to handle. The general propositions with which Mr. Beck summed up his remarks, however, are perfectly reasonable, and such as ought to have the support of the public. They were as follows: First, that all works of a monumental character or national importance should be open for competition to all architects in the Kingdom on fair and reasonable terms and conditions; second, that works under the jurisdiction of the county authority be either competed for by those practising within the county, or generally divided as occasion arises among them; third, that works under municipalities be given out in a similar manner among architects practising in such municipality; fourth, all salaried officials shall confine their attention to work for which they are specially trained, and in no case to the carrying out of new buildings or extensions to existing buildings, but only to such alterations as may not involve enlargement, and in the case of borough engineers to street and drainage works pure and simple, including of course advising the council on plans submitted for their approval. Also that a limit shall be placed on the number of their staff, according to the size and importance of the municipality where engaged; fifth, in all cases where professional men are engaged the usual terms of payment shall be observable in all respects, whether it be necessary for them to work in conjunction with the salaried official or not; sixth, salaried officials to be allowed the privilege of taking pupils, under certain restrictions and limitations.

NORTHERN ARCHITECTURAL ASSOCIATION.—A meeting of the Northern Architectural Association was held on the 31st ult. at the Y.M.C.A. Buildings, Newcastle. Mr. J. W. Taylor, President, was in the chair. Mr. Frank Caws, of Sunderland, presented his award in the essay competition on the subject of "Characteristics of XIIIth Century Architecture, with Special Reference to Moulding and Ornament." The first prize was given to Mr. H. L. Hicks, of Gosforth, and the second to Mr. W. Stockdale, of North Shields. Mr. J. Eadie Reid then delivered a lecture on "Designing for Mosaics and Stained Glass." He said there was only one way of designing, and that was through the narrow portals of invention. The designer must be able not only to see the subject as it presented itself to his mind's eye, but, by some curious subtle process, he must have the power of making the actors in the subject adapt themselves to the space to be decorated. There should be ease, simplicity, and directness. He urged that they should study drawing, and observe always. It was necessary to cultivate the art of drawing from memory. If there was a difficult bit they should analyse it and keep at it until they had thoroughly mastered every detail. The Japanese artist sat the whole day looking and studying, without touching either pencil or paper. There was no law; the method of one designer was not the method of another. It was just possible to draw too much and look too little. He urged the necessity of a knowledge of the material one was designing for, and commended a study of the pre-Raphaelites, with their simplicity. A study of the great master's works would enable the artist to avoid the dangers which would otherwise assail him; he would learn to avoid the stagnancy of the later men, and to appreciate the quiet dignity of the earlier. Passing from the conception to the execution, Mr. Reid spoke of the need for drawing from the life and from drapery. Colour should be the goal of the glass-painter; light and shade were out of place. Mosaic presented difficulties which were purely technical; and the designer should work in faith, with a clear perception of the end, aiming at something more than he could do. The best effects, he said, were gained by simple means. All movements must be slow and monumental; there must be no hurry. To be able to design one must be able to draw, and the only way to perfect one's drawing was to keep on drawing. At the same time, the designer required not merely a superficial knowledge of the material he was designing for;

he should endeavour to obtain a practical knowledge. A study of the old masters was not everything. If the artist had got the sense of design, there was no reason why he should not imitate, no matter how skilfully, the work of past ages. The mission of the artist was to see the things around him, and to render with all the knowledge and skill that were given him the imaginings of his brain.—On the motion of Mr. Joseph Oswald, a cordial vote of thanks was given to Mr. Reid.

COMPETITIONS.

THREE PUBLIC LIBRARIES, BELFAST.—The architects for the three Public Libraries at Belfast are Messrs. Grange-Watt & Tulloch, 77A, Victoria-street, Belfast.

BOOKS RECEIVED.

THE EIGHTEENTH CENTURY ARCHITECTURE OF BATH. By Mowbray A. Green, A.R.I.B.A. (Bath: G. Gregory.)

LAXTON'S PRICE-BOOK FOR ARCHITECTS, BUILDERS, ENGINEERS, AND CONTRACTORS, 1905. (Kelly's Directories, Ltd.; and Simpkin Marshall & Co. 4s.)

LIVES OF THE ENGINEERS. By Samuel Smiles. Popular edition. Metcalf—Telford. (John Murray. 3s. 6d.)

NATIONAL ENGINEERING AND TRADE LECTURES. Edited by Ben. H. Morgan. Vol. I. (Archibald Constable & Co.)

THE YEAR'S ART, 1905. Compiled by A. C. R. Carter. (Hutchinson & Co.)

CALCARBOUS CEMENTS: THEIR NATURE, MANUFACTURE AND USES. By Gilbert R. Redgrave and Charles Speckman. Second and revised edition. (Charles Griffin & Co.)

Correspondence.

REGISTRATION AND THE STATUS OF ARCHITECTS.

SIR,—The Royal Institute's inquiry into the custom of other countries as to the status of our profession is interesting. Russia figures as the chief of the three States where the profession is a close one. The wonderful influence that the proposed change is to have on the social status of architects is touched by a curious sidelight from no less a person than Tolstoy, whose observation is close enough in such matters. Describing a dinner party at a country house in Russia, in his novel "Anna Karenina," he tells us that "All wore evening dress except the architect."

GEORGE REAVELL, JUN.

WESTMINSTER CITY COUNCIL.

The first meeting of this Council after the adjournment was held on Thursday last week at the City Hall, Charing Cross-road, the Mayor, Lord Cheylesmore, presiding.

The China Trophy Gun.—The General Purposes Committee reported that, in reply to the Council's communication for a carriage to be supplied with the Chinese Trophy Gun allotted to the Council, they had received a letter from the Secretary of the War Office stating that a carriage did not form part of the trophy, as none was captured with the gun, and that the regulations did not admit of the expenditure of public funds in the alteration of a carriage for the purpose, but that, if desired, the obsolete carriage selected by Colonel Hobart could be supplied free of charge, leaving it to the Council to arrange for the necessary alterations and repairs. The Committee recommended that the offer of the military authorities should be accepted, and that the gun be placed in the Horseferry-road Gardens, instead of on the triangular refuge opposite the City Hall. The recommendations were agreed to without discussion.

The Unemployed and Paving Works.—A lengthy discussion took place on a report by the Works Committee on the question of the employment of some of the unemployed in laying work paving in Grosvenor-square, and on other paving works for the year, and also that the work was not of a nature which would be suitable for giving work to the unemployed, the Committee recommended "That no action be taken." Ultimately this was agreed to.

The Lifts at Piccadilly-circus Electric Railway Station.—It was reported that a letter had been received from the Railway Company stating that they were endeavouring to obtain a widening of the footway where these lifts discharge into the street.


Extensions at Covent Garden Market.—Amended proposals with regard to the new frontage lines, railings, areas, etc., at the corner of Wellington-street and Russell-street were approved. The three projecting piers to the railings on the Wellington-street frontage will be made flush with the line of railings, and the proposed step-ladders to the basement on the Russell-street frontage will be made single instead of double, allowing the whole line of boundary fence to be set back to the existing frontage of No. 8, Russell-street.

Bills in Parliament.—It was resolved to lodge petitions against a number of Bills which will come before Parliament in the ensuing session, among those to be opposed being the Baker-street and Waterloo Railway Bill, Charing Cross, Euston, and Hampstead Railway Bill, Central London Railway (New Lines) Bill, Great Northern, Piccadilly, and Brompton Railway Bills (Nos. 1 and 2), Hammersmith, City, and North-East London Railway Bill, the London County Council Tramways Bill, the Omnibus Bill (General Powers) of the London County Council, London Port and Docks Commission Bill, the London Squares and Enclosures Bill, and several of the London Electric Lighting Bills. In many cases clauses to protect the City Council were all that was asked for.

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE STEEL.—V.

A SIXTEEN-STORY OFFICE BUILDING (Continued).

 HE moulds for the concrete work were all made on the site of the building, the timber being cut as required by a motor-driven saw-bench moved up from floor to floor as the work progressed. The boards were planed on one face only, to reduce them to the required thickness, the other face being left as it came from the saw so as to give a rough surface to the concrete, with the object of providing a tooth for the plastering.

The column moulds were strongly built to resist hydrostatic pressure, the sides being formed of vertical boards joined together by being nailed to horizontal battens. The sides of the moulds were held firmly in position by means of horizontal frames built outside them, as will be seen by Fig. 27. Each frame consisted of two stout pieces of timber, placed one on each side of the mould, and connected by bolts passing horizontally through the projecting ends, distance pieces being fixed on the two other sides parallel with the bolts so as to form a rectangular frame. A sufficient number of such frames having been provided for each mould, the whole construction was tightly keyed up by driving timber wedges between the frames and the sides of the moulds.

The arrangement differs in point of detail from that illustrated in Fig. 3, p. 20, but is equivalent so far as concerns its practical effect. In one respect, however, it is far more convenient, as the frame can be very easily removed simply by unscrewing the nuts of the two bolts; then the side boards of the mould come apart quite readily.

After careful adjustment, the moulds were secured in position by diagonal braces of timber between each of the four sides and the under surface of the girder moulds.

The moulds for the girders (Fig. 28) were of simple construction, consisting of bottom and side boards clamped together, the upper edges of the vertical boards being fixed by nails passing through the planks used for the formation of the floor slabs. In order to avoid sharp angles at junctions of the girders and floor slabs, the girders were chamfered outwards at the top, as indicated in the drawing, so as to form a triangular fillet below the floor slabs at the point of junction.

The clamps employed for holding together the boards at the bottom consisted of a round rod forged at one end into the form of a hook and provided at the other end with a washer-shape so that when driven to a certain position it would hold the bolt by friction. To tighten the clamp the hooked end is held against the side board of the mould and the washer is then driven forward to the position shown in Fig. 28. To release the clamp, it is only necessary to strike a smart blow at the lower part of the washer.

The girder moulds were carried on timber joists attached to the column moulds and supported by intermediate struts where necessary.

About ten days were occupied in erecting the moulds for each story and two days in depositing the concrete, the quantity being about 120 cu. yds.

Fig. 29 is a vertical section showing part of a mould for the front wall of the building, between the window openings of two stories. The projecting part of the mould on the left side of the drawing is for the formation of one of the projecting ribs (mentioned in Article III., p. 64) by which the marble facing blocks are secured to the concrete. On the other side of the drawing is shown part of the floor centring, the opening above this providing for the junction of the concrete in the floor slab and the wall. All the wall moulds for parts of the building containing window openings were built up of boards placed horizontally and joined together by outside vertical cleats spaced about 3 ft. apart, and the lower panels were braced outside by timber struts notched into the projecting ends of timbers extending from the girder moulds and scotched below horizontal cleats nailed to the outside of the wall moulds.

The wall moulds were supported by shores and bracing to enable them to hold up the semi-fluid concrete, and in the case of moulds next to the party walls, the brickwork of the adjoining buildings was utilised, as far as its height

permitted, to form the outer side of each mould.

Three sets of moulds were erected at the commencement of work upon the superstructure, and, as soon as the bottom story was completed, and the concrete had sufficiently hardened, the corresponding set of moulds was taken down and re-erected for the concreting of the story above the top set of moulds. This process was repeated until the entire building was completed. The moulds were kept in position for about fourteen days after the concrete had set, and after their removal from the main girders intermediate support was given to these members by means of vertical struts for a further period of about thirty days, so as to permit the concrete to attain sufficient strength before being subjected to the entire load of the floor system. The adoption of this mode of procedure enabled the contractors to complete from two and a half to three stories per month.

For the convenience of the men engaged in building the wall moulds, in ramming the concrete, and in tapping the outside of the moulds to assist the concrete to fill all spaces, a temporary balcony was constructed round the building at each story, these balconies being supported by projecting beams anchored down inside the building and supported at the free end by diagonal struts bear-

ing against the outer wall. Tarpaulin sheeting was hung below the balcony to catch any drippings from the wet concrete, and thus to protect the marble facing and the men working below.

By building the columns first and following on with the walls, main girders, joists, and floor slabs, the entire weight of the structure was carried by the columns, and, with the exception of the exterior balconies and a few struts, no falseworks were required for the construction of the main features of the building. It may be stated, however, that scaffolding was used by the plasterers and other mechanics in finishing the interior details of the structure.

In building the floors the reinforcement was first laid, wired in position, and supported on cross rods so as to leave about $\frac{3}{4}$ in. clearance between the bars and the bottom of the mould. When the concreting had once been commenced, it was continued until the completion of the entire floor, to avoid any break of continuity. After being dumped, the concrete was rammed and the surface dressed smooth and true by straight-edge and level. The girder moulds were filled at the same time as the floor moulds.

Metal sleeves and boxes in the walls and floors for pipes and electric wires were placed in predetermined positions as the work proceeded so as to obviate cutting away. To keep out the

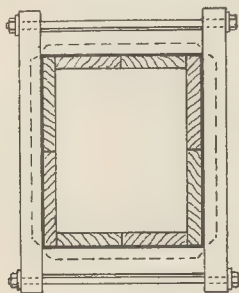


FIG. 27.

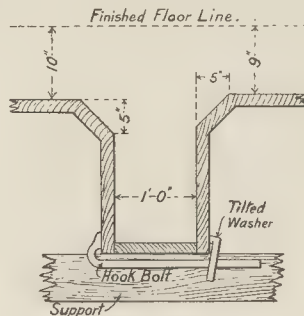


FIG. 28.

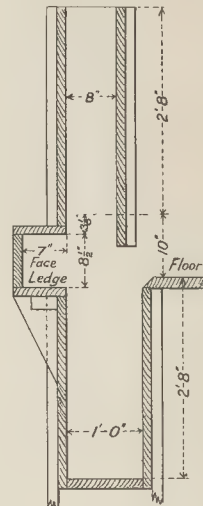


FIG. 29.

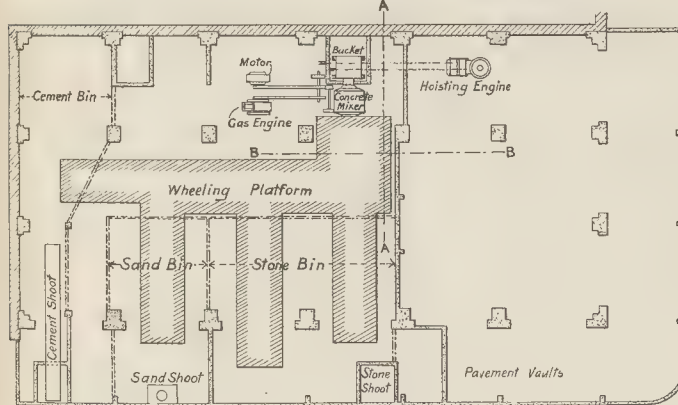


FIG. 30.

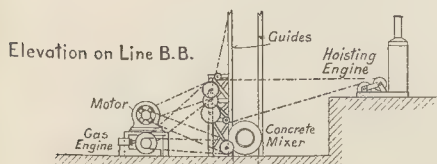


FIG. 31.

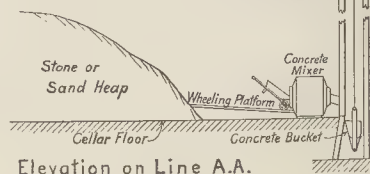


FIG. 32.

Illustrations to Student's Column.

concrete, the sleeves were filled with sand, which was afterwards removed.

One of the most noteworthy features in connexion with the construction of this building was the avoidance of undue interference with street traffic, such as occurs when large steel columns and girders have to be delivered upon the site of a steel frame building. It may be mentioned further that the large derricks and other heavy hoisting machinery usually employed in modern building operations were not required, the hoisting apparatus being limited to a light derrick for unloading the steel reinforcement, three or four movable frames for fixing the marble slabs of the lower stories, and an internal hoist for conveying concrete and timber from the basement to the upper stories of the building.

Full advantage was taken of the basement for the storage of materials, and as soon as the excavation had been completed, three large store-rooms (see Fig. 30) were built on the floor for cement, sand, and stone. These were filled from carts or vans by shoots, the positions of which are indicated in Fig. 30, which is a plan of the basement. As the store-rooms contained enough material for the building of two complete stories, the contractors were fairly secured against the possibility of delays arising from the non-delivery of material at the times expected. A platform was constructed so as to facilitate the wheeling of materials from the store-rooms to the concrete-mixing machine, and, to reduce labour, these platforms sloped downwards towards the mixer (Fig. 32). At one side of the basement, a complete concrete plant was laid down, consisting of a concrete mixer, a concrete hoist, a steam engine and boiler, a gas engine, an electric motor, and the necessary mill gearing (see Figs. 30, 31, and 32).

The concrete mixer was of the revolving drum type, running at ten revolutions per minute, and so arranged that the materials, brought from the store-rooms in barrows of known capacity, could be tipped directly into the drum and the mixed concrete afterwards discharged into the bucket of the adjoining hoist without interrupting the revolution of the machine. By this arrangement very little time was lost between the completion of one batch and the commencement of the next. The mixer held about 18 cub. ft. of concrete, but, as it was not usually possible to utilise the machine to its full capacity, the average output was not more than about 10 cub. yds. an hour. As a general rule, the mixer was driven by belting from the electric motor, but, to guard against delay owing to temporary breakdown of the motor, provision was made for running it from the gas engine (see Fig. 31).

The concrete hoist, also available for raising timber, was extended to the upper floors as the building progressed. The hoisting bucket was of special design, being constructed of steel, pivoted eccentrically at the bottom and provided with a spout which could be inserted below the outlet of the concrete mixer so as to receive its contents when desired. When the bucket had been hoisted to any floor above it could be tilted so as to discharge concrete into a shoot, provided at the bottom with a simple form of gate valve, whence the concrete was poured out into barrows and wheeled to the required points (see Fig. 32). Under ordinary circumstances, the hoist was driven by belting from the steam engine, but pulleys and belting were also provided so that it could be operated by the electric motor or the gas engine. Fig. 31 is a diagram showing the alternative methods of driving the mixer and the hoist.

The type of barrow used on the upper floors had two wheels, and was designed so that the concrete could be discharged over the front end the barrow being wheeled over tracks laid above the tops of the moulds. The concrete mixer, hoist, and barrows were designed and supplied by the Ransome Concrete Manufacturing Company.

For dealing with the concrete, a staff of twenty-eight men was engaged, made up as follows:—

Wheeling cement, sand, and stone	9
Attending to mixer and hoist	1
Attending to hoist on upper floor	2
Wheeling concrete on upper floor	4
Depositing and ramming concrete on upper floor	12
Total	28

Including carpenters and other mechanics, the total number employed on the building was about sixty men.

Partitions dividing up the different stories into offices and other rooms were built of hollow "Mackolite" blocks, and the ceiling cornices were formed by metal strips, wire netting, and plaster. Apart from doors, windows, and similar internal fittings, these are practically the only portions of the building not constructed of concrete steel.

Messrs. Eizner & Anderson, of Cincinnati, were the architects of the Ingalls Building, and to them is due the credit for the erection of this monolithic concrete-steel structure. The general design and the detail drawings were prepared by the architects, and the details of the concrete construction—which exemplifies the Ransome system—by the chief engineer of the Ferro-Concrete Construction Company.

GENERAL BUILDING NEWS.

CHURCH, KIRKBY WOODHOUSE.—To replace the present Church of St. John, which was erected as a chapel-of-ease to the mother church of Old Kirkby, in 1860, a new church is to be built at Kirkby Woodhouse, at a cost of 10,000*l.*, with school and institute, and on Saturday last the Duke of Portland laid the foundation-stone. The building will consist of a nave, 77 ft. long, and 24 ft. wide internally, divided in five bays, with arcades and aisles, the aisles being merely passages 3 ft. 6 in. wide; a chancel, 53 ft. long and 20 ft. wide, with an apsidal east end; a tower and spire, the lower part of the tower giving space for the organ, and the upper portion of the tower and spire (to be built at a later date) providing accommodation for the ladies and choir and clergy vestries. The building is designed in the Early English style, with plain lancet windows. The church will accommodate about 400 people. The builder is Mr. William Smith, of Newark, Mr. D. Davies is the clerk of works, and the architect is Mr. Louis Ambler, of London.

METHODIST CHURCH, SNEINTON.—The New Sneinton Methodist Free Church has been erected from plans prepared by Mr. William H. Higginbottom, architect, Nottingham, seating accommodation being allowed for 450 persons. The contract was let to Mr. John Lewin, of Netherfield. The building is situated on a site at the corner of Sneinton-boulevard and Thurgarton-street, and is of red pressed bricks, with stone dressings. The main front entrance is approached from a gateway at the junction of the boulevard and Thurgarton-street; additional exits and entrances are provided from the boulevard and Thurgarton-street. Internally the walls have a wood dado, and above this the walls are plastered. The seats (chairs) are arranged in three blocks with two aisles; there are also two transepts. The choir is at the back of the pulpit, which is of oak. Underneath the chapel is the schoolroom and five classrooms; separate entrance is provided for the boys' from the boulevard and the girls' from Thurgarton-street. The buildings, exclusive of the site, have cost 4,000*l.* Messrs. Thos. Danks & Co. have carried out the heating; the plumbing and sanitary work is by Messrs. Humphrey & Co.; and the painting and decorating by Mr. A. Shipley.

WESLEYAN CHURCH, WOKING.—The new church at Woking is situated in Commercial-road, and is a red brick structure with white stone facings. The spire rises to a height of over 100 ft. from the ground. The nave, transepts, and choir provide accommodation for nearly 500 persons, while another 150 can be seated in the gallery, erected over the vestibule and a small portion of the church. Attached to the church are vestries for the minister and choir, and a church parlour. The school premises, which are not yet completed, form a detached block at the rear of the site and have corridor communication with the church. They comprise an assembly hall, 54 ft. by 33 ft., a lecture-room, and six classrooms, besides kitchen and lavatory accommodation. The designs of Messrs. W. J. Morley & Son, of Bradford, have been carried out by Messrs. W. J. Drowley & Co., of Woking, whose contract amounted to 7,054*l.*

CHURCH RECTOR, NEW SCHOOLROOM, LITTON.—The foundation-stone of the new schoolroom, of the old Wesleyan chapel, at Litton, and also for the erection of a new schoolroom, were laid recently. The work is being carried out, under the supervision of Mr. Joseph Smith, architect, Sheffield, by Mr. Robert Brightmore, mason, and Mr. Richard Lomas, joiner, both of Tadworth.

SCHOOL, BRISTOL.—The new Council school that is in process of erection at Air Balloon Hill—between the main road to Hanham and the main road to Kingswood—will be opened in about two or three months' time. The school will consist of three departments—

boys', girls', and infants'—each department to provide accommodation for 350 children. The buildings will also include a coker's centre, a manual-instruction centre, and a caretaker's house. The architects of the buildings are Messrs. La Trobe & Weston, Bristol; the general contractors, Messrs. Clark & Son, Bishopston; and the heating apparatus will be provided by Messrs. Darby Brothers.

SUNDAY SCHOOL, HEXHAM.—The new Sunday school that has been erected at Shaft Leazes at the west end of Hexham by the United Methodist Free Church was opened on the 26th ult. A new chapel is to be built adjoining it, but in the meantime the new school will be used for the services of the church. The new school, which is provided with classrooms and a kitchen, together with the site, has cost something like 2,300*l.* Mr. T. E. Davidson, of Newcastle, was the architect, the work of erection being entrusted to Mr. T. Dorin, builder, Hexham.

MISSION-ROOM, LOW TEAMS.—The foundation-stone of St. Martin's Mission-room, Lundens-street, Low Teams, was laid recently. Mr. F. W. Purser is the architect, and Mr. William Hall, of Bensham, the contractor.

MISSION BUILDINGS, ISLINGTON.—The new Mission premises which have been erected for St. Peter's Parish, Islington, were opened on the 25th ult. The building consists of ground, first, and second floors. On the ground floor is the main room, with sitting accommodation for about 150 persons. Clubrooms and classrooms and caretaker's apartments are provided on the two upper floors. The total cost was 2,800*l.* Messrs. James & Laycock are the architects.

COUNCIL CHAMBER, WHICKHAM.—A block of buildings has been erected at Whickham by the Whickham Urban District Council, comprising Council offices, caretaker's apartments, etc. The external walls of the buildings are of Eighton Banks freestone, pitch-faced blockers in courses, while all the dressings are of red freestone from the Closeburn Quarries, Thornhill, Dumfriesshire. The main entrance is in the centre of the building, and is approached by a flight of steps leading from the grounds. The entrance leads into the main hall from which corridors branch off to the several offices on either side. All the offices are on the ground floor. The staircase leads from opposite the main entrance to the first floor, upon which are situated the Council chamber, two committee-rooms, writing-room, and cloakroom. Lavatory accommodation is provided for both floors. The caretaker's quarters are situated at the eastern end of the buildings. The buildings are lighted by gas throughout and heated by means of open fireplaces, which in the Council chamber and committee-rooms are augmented by gas radiators. The Council chamber is 33 ft. long by 25 ft. 6 in. wide. Access to both committee-rooms may be gained direct from the Council chamber and cloakrooms. The buildings, fittings, etc., have been carried out according to plans, specifications, etc., prepared by and under the supervision of the Council's Surveyor, Mr. J. B. Benton. The contract for the buildings and fittings was entrusted to Messrs. J. W. Turner, of Gateshead.

NEW PAVILION AT CARDIFF INFIRMARY.—A new pavilion for electrical treatment was recently opened at Cardiff Infirmary by Sir W. H. Preece, K.C.B. The new block has been erected on the northern side of the central corridor, in a position convenient to each of the main blocks. A short branch corridor gives access on the left hand to the new photographic department, in which, in addition to ordinary photographs, those obtained by the X-rays of subjects under treatment are dealt with. On the right is a room for sinusoidal baths, and beyond it the dark room for application of the Röntgen rays. The short corridor conducts into the lamp-room. This department can, however, be entirely closed off from the infirmary when desired, as an independent access to it has been made direct from Newport-road, allowing the patients who must be habitually in attendance over their prescribed period without treatment to enter and leave the department, and the infirmary itself. A light entrance porch has been placed at the north-western angle of the lamproom block, from which a waiting-room and then a dressing-room are entered. This room contains fittings for individual patients. Lieut. Colonel Bruce, of the 1st Dragoon Guards, is chairman of the building committee, and Mr. Edwin Seward the infirmary architect. The general contractors for the work were Messrs. C. Beames & Nephew, the hot water, heating, etc., being executed by Messrs. J. Williams & Sons, and the metal work by Mr. James Gibbon.

CLUB PREMISES, SUTTON-IN-ASHFIELD.—The new premises of the Sutton-in-Ashfield Conservative Club, Forest-street, were recently opened by Mr. F. P. Cook, architect, of Mansfield, and the contractor was Mr. Greenwood.

ANITARY AND ENGINEERING-NEWS

ELECTRICAL POWER SCHEME, LONDON.—A bill to introduce in the course of the next Parliamentary session, whereby they seek to form a new company, with an initial capital of £5,000,000, for the supply of electrical energy in bulk to distributing agencies, including municipal authorities, from generating stations at Fulham, Silvertown, and Greenwich. The company's designated engineer is Mr. Charles Marz, Engineer to the Newcastle Electric Supply Company, and it is estimated that each of the three stations will eventually be equipped with machinery of 10,000 horse-power. The Bill comprises provisions for limiting the rate of dividends to per cent. until the price of power shall have been reduced to below a statutory maximum schedule, which ranges from 1d. per unit to slight excess above 3d. per unit, according to the period over which the supply is extended per week, and for enabling the company to give a direct supply of power to the public to make satisfactory terms with a consumer, with appointment of the Board of Trade as arbitrator between the two parties.

THE SHORE SEWERAGE SYSTEM AT KARACHI.—At the meeting of the Institution of Civil Engineers on the 24th ult. Mr. J. R. Brunton read a paper on the Shore Sewerage System at Karachi (India), in which he said that the efficiency of the system established there was not as good as it was alleged to be, and that it fell off until the work done at the ejectors only represented about 18 per cent. of the indicated horse-power of the engines. The result was that the engines were unable to cope with the work, and this led to the author undertaking a careful inquiry into the efficiency of each component of the installation. From trials made it was found that the preventable loss of power was taking place was due entirely to leakage in the air-main and its attachments, the most probable source of waste being the automatic air-valve at the ejectors. Endeavours were made to increase efficiency, with the result that the work done at the ejectors now averages 26 per cent. of the indicated horse-power of the engines, a gain of 8 per cent. It was shown at the maximum possible efficiency of the whole system, assuming that the efficiency of the ejectors is 0.650, could not exceed 564 under existing conditions of working. These figures were derived from the results of daily working, and were believed to show accurately the possibilities of the Shore system of drainage, so far as regards its theoretical and practical efficiency.

DOCK, SOUTH SHIELDS.—A new dock, constructed at Wapping-street, South Shields, for Messrs. Brigham & Cowan, Tyne ship-repairers, was opened on the 25th ult. The new dock, which is situated close proximity to a Direct Ferry Landing, has been under construction for over four years. It has been excavated and built by Mr. H. M. Nowell, of Leeds, to the designs of Mr. John Thompson, civil engineer, Newcastle-on-Tyne. It is capable of accommodating a vessel 400 ft. in length, a gain of 3 per cent. The dock is 10 ft. long by 72 ft. broad and 30 ft. deep, and it will permit of a steamer being docked undocked at any state of the tide.

BRITISH STANDARD PIPE FLANGES.—All users of steam pipe and many users of water pipe will welcome the series of "British Standard Tables of Pipe Flanges" issued last week by the Engineering Standards Committee. In dealing the diameter of flanges, the committee are obliged to adopt dimensions complying with the requirements of valve makers, but as they agree very closely with the conditions obtaining in the case of cast-iron pipes, the difficulty was that presented by welded flanges. As the strength of joints made with such flanges is materially increased by increasing the diameter, a special table of dimensions has been prepared for application to long pipe lines. Two other tables relate to flanges for pipes subject to steam pressures of 15 lb. to 35 lb. per sq. in. Table I gives the dimensions of the flanges for pressures up to 15 lb. per sq. in. Table II. refers to "intermediate-pressure," "high-pressure," and "extra high-pressure" flanges, and an excellent feature is that, in the case of the diameters of flanges, the diameters of the bolt circles and the diameters of the bolts are identical, the only differences being represented by variations in the thickness of the flanges and the diameters of the

bolts. In Table III., defining permissible dimensions for welded-on flanges, the flange and bolt circle diameters are the same as those adopted in Table I., but the flange thicknesses and the numbers of bolts are necessarily different. The decision that the number of bolts shall in all cases be a multiple of four constitutes a departure from established practice, but in view of the proportions adopted this does not involve any loss of strength or efficiency.

MISCELLANEOUS.

HOUSING OF THE WORKING CLASSES ACTS, 1890 AND 1903.—At the meeting of the Poplar Borough Council, on Thursday of last week, the Public Health and Housing Committee presented a long report upon the law in relation to the demolition of dwelling-houses after closing orders have been made. After quoting from the Housing of the Working Classes Acts, 1890 and 1903, the Medical Officer comments as follows:—

By section 33 (4) it is apparently optional with the local authority whether they will order the execution of the works necessary to render the dwelling-house fit for human habitation; but it would appear that, unless they do so, they cannot make an order for the demolition of the building. It is a very strange state of the law that a house cannot be pulled down which is not reasonably capable of being made fit for human habitation without the local authority making an order for the execution of the works necessary to render the dwelling-house fit for human habitation. So the house remains up and empty to the cost of the ratepayer. The same remarks, viz., stating the necessary works, &c., must also apply to the London County Council, if they resolve to act in default of the local authority under section 45 (2). This state of the law requires amending, and the attention of the Local Government Board and London County Council should be directed to it.

The amendment of the law would seem to be to give local authorities the same power under the Housing Acts in respect of closed houses which remain neglected and dilapidated as the London County Council have under the London Building Act, 1894, section 115. The Committee's report continues as follows:—

"In considering an amendment to the Housing of the Working Classes Acts, the Medical Officer suggests that consideration might also be given to the case of an obstructive dwelling-house which has been closed as unfit for human habitation on account of it being in a state so dangerous or injurious to health. Such dwelling-house should not be allowed to be made fit for human habitation if it be an obstructive building. If the law could be so amended, it no doubt would materially assist matters when representations in respect of areas are being considered, as it would prevent obstructive buildings, which are also unfit for human habitation, being repaired, and more compensation demanded later on."

Communications are to be addressed to the London County Council and the Local Government Board with reference to the matter.

LONDON BUILDING ACTS (AMENDMENT) BILL.—A number of the metropolitan borough councils have referred to committees for consideration and report a circular letter received from the Honorary Secretary to the District Surveyors' Association enclosing copies of resolutions passed by that body submitting that the London Building Acts (Amendment) Bill, 1905, will be absolutely unworkable from its magnitude and complication, and urging that the only satisfactory course is to embody the amendments in a new Bill to supersede the present Acts, which should only be brought before Parliament after careful consideration by the various authorities and professional societies interested therein. It is further submitted that many of the powers proposed to be taken by the London County Council should be the subject of specific rules to be enacted by Parliament, and administered by the district surveyors.

LONDON BUILDING ACTS (AMENDMENT) BILL, 1905.—The Parliamentary Committee of Stepney Borough Council reported on Monday agreeing with a suggestion of the Works Committee that the Parliamentary agents be instructed to present the Bill in opposition to clauses 24, 25, 35, and 156 of the London Building Acts (Amendment) Bill, 1905; also that the Council join with other metropolitan local authorities in opposition to the Bill, and that five delegates be appointed to the conference convened by the Kensington Borough Council in regard to the matter.

CAMBRIDGE UNIVERSITY LIBRARY.—With the concurrence of the Library Syndicate the Cambridge University Association make an appeal for funds on behalf of the improvement and maintenance of the library buildings. Two capital sums are required—£1,200, for immediate needs, and £26,700, for a permanent endowment. The present requirements extend to bookcases and fittings for the rooms recently acquired; alterations and repairs of some of the older rooms, especially

by way of precautions against fire; a room for reading and reference purposes; modern appliances for students and the staff; an increase of the permanent staff; and the installation in part, with continuation, of the Acton Library.

BRICK TRADE PARALYSED.—The brickmaking trade is in a very depressed condition, and while all the works at Fletton, near Peterborough, have considerably reduced their output, it is probable some will close down altogether, and the number of men who are now idle will be increased. The price of bricks has fallen from 30s. per 1,000 to 12s., and the brick masters are appealing to the Peterborough Assessment Committee for a reduction of at least a third of their assessments. The slump is attributed to the fact that there is little building going on just now, although an improvement is expected in the spring. One firm alone has 7,000,000 bricks stacked. *Nottingham Guardian.*

LIVERPOOL CATHEDRAL.—Lord Derby presided at a meeting of the general committee of the Liverpool Cathedral held on the 30th ult., at the Town Hall, Liverpool. Mr. F. M. Radcliffe, one of the hon. treasurers, presented a statement showing the present financial position of the undertaking. He stated that the contributions and promises to date included seven sums of 10,000, each, one of 5,000, one of 3,000, six of 2,000, each, forty-four of 1,000, and upwards, thirty-three of 500, and upwards, and 243 of 100, and upwards, the total being 197,901. The contributions for special purposes amounted to 18,844, and embraced 10,000, for an organ, 2,000, for a window, 1,200, by the family of the late Mr. W. E. Gladstone for a purpose yet to be ascertained, 625, by the Liverpool Gladstone Memorial Committee, 2,014, for a pulpit, 1,014, for a window, 1,017, for a font, 400, for communion rails, 300, for a window, and 80, for a window. The interest on the investment and bank interest amounted to 8,777, bringing the grand total to 225,237. The special gifts mentioned were irrespective of others, including one by the Earle and Langton families, which, though not included in the present balance-sheet, had been handed to him since the beginning of the year, while other special gifts were the Ismay window and the Latham chapel. On the expenditure side they had spent on the building site, 19,294, excavation and foundations, 2,500, and in connexion with the foundation-stone laying ceremony by the King in July last 703. After meeting other expenses, the total sum they had now available for the main building was 145,918, and as the architect's estimate for this portion of the work was 277,000, it left 130,000, still to be raised.

LONDON STREET NOISES.—The fifth conference of the Street Noise Abatement Committee was held at 2, Harrington-gardens, South Kensington, on Monday evening, when the following resolution, proposed by Capt. Murray-Cookesley, and seconded by Mr. Felix Moscheles, was adopted:—"That in view of the unsatisfactory character of the existing by-laws respecting street noises, and the unreasonableness of expecting private individuals to put the same into force, the London County Council, the Corporation of the City of London, and the borough councils be requested to appoint noise inspectors, whose duties would be to inquire into, and suppress by legal measures, all unnecessary and objectionable noises in the streets and public thoroughfares of the metropolis."

THE LATE MR. BLASHILL.—As an addition to the obituary notice in our last issue, we learn that Mr. Blashill, when first coming to London, entered the office of Mr. T. E. Knightley, with whom he remained for three years.

THE TANTALUM LAMP.—The new glow lamp which is being manufactured by Messrs. Siemens & Halske, of Berlin, was fully described in a paper read to the Elektrotechnischer Verein by Drs. von Bolton and Feuerlein on January 17. The filament of this lamp is not made of carbon, but of a metal called tantalum, which was first obtained in the pure state by von Bolton. It is somewhat darker than platinum and has a hardness approximately equal to mild steel. When it is drawn into wire its tensile strength is greater than that of steel, and for the same bulk it is more than twice as heavy. At present it is fairly expensive, but as 1 lb. of the metal makes sufficient wire for about 20,000 lamps, it promises already to be a serious rival to carbon in lamp making. The filament is much longer than that used in ordinary lamps, but as only short lengths of wire are between the twenty-four supporting hooks, it is mechanically strong and can withstand rough usage. The filaments are approximately vertical, and lie on the circumference of a cylinder surrounding the central holder. When photometred, in the ordinary way, the efficiency—that is, the light given up for a

given consumption of electric power—is found to be more than double that of the best carbon glow lamps. The life tests made by Dr. Feuerlein prove that it will last in a satisfactory state as long as the best modern carbon filament lamps. The only point in the paper which is a little obscure is whether the candle-power measured is the horizontal candle-power or the total candle-power. The tantulum lamp will obviously distribute its light in a different way to the ordinary glow lamp, and thus, just as comparison between tests of the horizontal light emitted by incandescent gas burners and glow lamps may prove misleading, so also may tests of this new lamp. The only satisfactory tests of the light emitted by a lamp are by means of a Blondel luminometer, or by some form of integrating photometer, such as the Russell-Leonard, which is used in America. Discounting, however, possible errors from this cause, we are certain that the carbon filament lamp has got formidable rivals in the Nernst lamp (now widely used) and in this new tantulum lamp.

PROPOSED IMPROVEMENTS, LIVERPOOL.—On the 26th ult., Colonel W. R. Slacks, R.E., held an inquiry on behalf of the Local Government Board, at the Municipal offices, Dale-street, in regard to an application of the Corporation for sanction to borrow £5,000, for the purchase and demolition of insanitary property under the powers of the Liverpool Sanitary Amendment Act, 1864. Mr. R. D. Cripps (Assistant Town Clerk) said that the application originally was for sanction to borrow £5,000, but the Local Government Board had granted them £5,000, to enable them to get on with work that they had in hand. Under the Act of 1864, and its extensions, they had already spent 400,000, in purchase and demolition. Between 7,000 and 8,000 houses had been demolished, and there were still 8,000 or 9,000 houses to be dealt with. The Corporation had given a pledge to rehouse 50 per cent. of the people dispossessed, and since they agreed to do this—October 26, 1899—4,513 persons had been provided for, leaving a balance of 158 to be still provided for under the obligation. Apparently the Corporation had not fulfilled their pledge, but in those figures which were up to date, was included 50 per cent. of the population—653 persons—who would be dispossessed under the eighteenth presentment of the grand jury, which required 372 houses to be demolished. That work was now being proceeded with. In order that the Inspector might arrive at an opinion as to whether that pledge ought to be continued, increased, or diminished, he mentioned that the head constable made a return on December 24 showing that the number of vacant houses of 5s. a week and under on that date was 1,143, and of 20s. a year and under was 3,150, making a total of 4,293. Since 1901 the Corporation had demolished about 1,500 houses. The reason for the large number of vacant houses was that the Corporation had perfected their electric tram system, and there had been a large amount of building on the outskirts of the city, people being taken there cheaply. Houses of all classes were being built in the outskirts at the rate of 2,000 per year. Dr. Hope (Medical Officer of Health) and Mr. F. T. Turton (Deputy-Surveyor) gave evidence bearing out in detail the statement of Mr. Cripps. The Inspector remarked that he intended to make himself acquainted with the nature of the accommodation they provided for the people.

PROPOSED NEW FIRE STATION, JARROW.—On the 23rd ult., Mr. R. H. Bicknell, M.Inst.C.E., held an inquiry, at the Jarrow Town Hall, respecting an application of the Corporation for sanction to borrow £1,000, for the erection of a fire brigade station in Wyham-street, and to provide fire extinguishing appliances. Mr. J. Petree, Borough Surveyor, said it was proposed to erect the new station on the ground adjoining the town hall, and connected with it would be telephonic communication. Mr. Petree also presented a plan of the proposed station for the consideration of the Inspector, and the inquiry closed.

Legal.

CASE UNDER THE LONDON BUILDING ACT.

At the West London Police Court, on January 24, Mr. Henry Jordan, builder, was summoned before Mr. Garrett, one of the magistrates at the above-named Court, at the instance of Mr. F. W. Hamilton, District Surveyor for North Fulham, for having commenced certain works in, to, or upon a building, without serving a building notice, in accordance with the requirements of section 145 of the London Building Act, 1894.

The defendant had, to suit the convenience of the employers, at night time, after the premises were closed, out an opening in the party wall dividing two shops at No. 86 and 86A, Lillie-road, Fulham, whereby the said buildings were united in contravention of certain provisions of the Act.

The defendant was fined 20s., and 2s. costs. At the same time, the occupiers of the premises, Messrs. Leon Roberts, Ltd., were summoned for non-compliance with a notice of irregularity, served by the District Surveyor, requiring them to close up the opening out in the party wall.

The magistrates adjourned the summons, at the defendants' request, to enable them to make an application to the London County Council in reference to certain proposed alterations to the premises.

COMBINED DRAINAGE DISPUTE.

THE case of Nathan v. Rouse came before a Divisional Court of King's Bench, composed of the Lord Chief Justice and Justices Kennedy and Ridley, on the 25th ult., on the plaintiff's appeal from a decision of the County Court judge of Shoreditch.

Mr. Macmorran, K.C., and Mr. Moyes appeared for the appellant, and Mr. R. Cunningham Glen for the respondent.

Mr. Macmorran said the action was brought by the occupier of one house to recover from an adjoining occupier a proportionate part of the cost of abating a nuisance under section 120 of the Public Health Act, 1875. Mr. Nathan had been served by the local authority with notice to abate a nuisance caused by the escape of sewage on his premises from a drain which drained three adjoining houses, the middle house being in the occupation of Mr. Nathan, and an order was made on Mr. Nathan to abate the nuisance. Mr. Nathan did the necessary repairs to the drain on his own premises, and commenced the present action to recover a proportionate part of the expenses from the defendant (one of the adjoining occupiers) under section 120 of the Act. The County Court judge found that the whole of the money which the plaintiff claimed was for work done on his premises, and that there was no evidence to show that the defendant was liable to repair or make good the drain running from his house under the plaintiff's As it seemed to the learned County Court judge that it was the plaintiff by whose act and default the drain allowed sewage to escape, the nuisance was not caused by any act or default of the defendant, and he gave judgment for the defendant. The learned counsel contended that, as the defendant sent sewage from his premises into the drain, he was liable to contribute under the section.

Mr. Glen, for the defendant, submitted that, as the defendant was under no obligation to repair, he was not liable to contribute to the expenses incurred by the plaintiff.

In the result, the Lord Chief Justice, in giving judgment, said he was not able to say that the finding of the learned County Court judge, that there was no evidence that the defendant was liable to repair or make good the drain running from his house under the plaintiff's, was wrong as a matter of law. There was no evidence of an obligation on the part of the defendant to repair the drain, and he could not come to the conclusion that the County Court judge was wrong in holding that there was no act or default of the defendant causing the nuisance.

Justices Kennedy and Ridley concurred, and the appeal was accordingly dismissed, with costs.

COSTS IN AN ACTION FOR DILAPIDATIONS.

THE case of Clark v. Cleveland came before a Divisional Court of King's Bench, composed of the Lord Chief Justice and Justices Kennedy and Ridley, on the 27th ult., on the plaintiff's appeal from an order made by the County Court judge of Farnham that plaintiff should pay part of the defendant's costs in an action for dilapidations.

It appeared that the defendant was the tenant of the plaintiff, and the house let being out of repair, the plaintiff, before the tenancy determined, inspected it and told the defendant what he required done in discharge of the covenants in the lease. The defendant employed a surveyor, and there was some communication between the surveyor and the plaintiff, but it was not until some time after the tenancy had determined that there was any definite admission of liability on the part of the defendant. Subsequently a letter was written on the defendant's behalf containing the suggestion that the parties should agree upon an independent surveyor to settle the matter. To this the plaintiff replied that a new tenant had gone into the house, and the

matter must take its course. The plaintiff then brought the present action, and when it came on for hearing the parties agreed that, as it was only a question of amount, the matter should be referred. The County Court judge (Judge Russell), upon these facts, directed a verdict for the plaintiff, and made an order that the defendant should pay the plaintiff's costs up to that date.

After hearing the arguments of counsel, the Lord Chief Justice, in giving judgment, said the point to be decided was whether the learned County Court judge had a discretion, and acted upon it judiciously in ordering the successful plaintiff to pay the defendant's costs up to the time of an effective admission of the defendant's liability. His lordship did not think it could be said that the plaintiff's letter saying that the matter must take its course was unreasonable. He did not think that the learned County Court judge, in the circumstances of the case, had any materials on which he could properly exercise a discretion to make the plaintiff pay the costs incurred by the defendant.

Justices Kennedy and Ridley concurred, and the appeal was accordingly allowed.

Mr. Barnard Lailey appeared for the appellant, and Mr. Colman for the respondent.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

219 of 1904.—W. F. COLE: *Floor Clamps*.

A device, consisting in the combination of an elongated base, a plunger arranged for reciprocatory movement longitudinally of said base, a head having a grooved face mounted transversely of the plunger at its forward end, serrated plates positively clamped upon the side of said base, the teeth of said plates gradually increasing in length from the forward to the rear ends thereof, and mechanism mounted upon the base for advancing the plunger and locking it in advanced position.

313 of 1904.—F. W. BRITTON and L. H. CROSS: *Locking Device for Nuts*.

A nut-securing device, wherein locking washers are employed, consisting in the provision on the washer which is to engage with the nut of one or more projections adapted to catch the nut as it is screwed down so that said washer is carried round by the nut, and also of one or more substantial ridges onto, against, or between which the side face of the nut become bedded as this latter is tightened down.

2,935 of 1904.—T. E. DEVONSHIRE: *Linings for Tunnels, Subways, Lift Shafts, and the like*.

Segments for lining tunnels, subways, lift shafts, and the like, said segments being made of curved blocks of concrete reinforced by a construction of rods, wires, or expanded metal, or the like, towards the convex and concave face of the blocks, and having between the said rods or wires, expanded metal, or the like, ribs forming part of, or extending across, a metal frame perforated with bolt holders, spaces being left for the introduction of the bolts.

3,062 of 1904.—N. G. BACON: *Window Curtain Supports and Hangers*.

A device for suspending curtains, said device consisting of a rod or arm having one end arranged to turn horizontally in a socket or in sockets so as to form a bracket, and so that the arm or rod and the curtain suspended therefrom can be swung horizontally through a semi-circle or through any part of a semi-circle.

3,113 of 1904.—J. T. NEAL: *School Desks, and the like*.

A desk provided with a pivoted top, consisting in the combination of aiding fulcra, pivoted supports, and curvilinear slots, with or without recesses, whereby the said top may be moved to and held in the various positions.

3,627 of 1904.—J. CARTWRIGHT: *Portable Fire Stoves*.

Portable fire stoves for cooking and other purposes, constructed from a few simple parts adapted for compact packing or bundling together without the use of tools, or of bolts and nuts, or other loose or independent fastening devices.

3,737 of 1904.—W. REUTHER: *Means for Lifting or Charging Cranes, Elevators, Conveyors, and the like*.

Cranes, elevating apparatus, conveyors, and the like, comprising a magnet or magnets for

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

ipping the material, and a holder cradle, receptacle, or conveyor band in or unto which the material is discharged, the provision of means whereby the loading magnet or magnets is or are given a swinging motion or intermittent motion, and for motion for enabling the magnet or magnets frequently to rise and to discharge them in or into a said receptacle or conveyor band.

2321 of 1904.—W. ALLMAN and J. H. WATSON: *Door-closing Apparatus and Door Checks.*

This relates to door springs, consisting in the combination of a shoe secured to the lower part of the door, having a rod subject to the action of a spring, having at its forward end a lug and spindle mounted in a shallow box end in the floor, said spindle provided with a nut or the like.

538 of 1904.—F. BARKER: *Locks.*

A lock guard, fitting upon the stump of lock which acts as a pivot for the levers of the lock, and also upon the stump in the lock, with a longitudinal slot therein, which allows of lock to traverse.

076 of 1904.—G. F. LAWRENCE: *Sash Balances.*

A sash balance, consisting in the combination of a casing, a spring-operated gear wheel rotatably and adjustably suspended therein, and a locking device adapted to recede from and approach the gear wheel, such parts being respectively formed and being adapted to cooperate.

371 of 1904.—W. McLAREN: *Dust Screen for Railway Carriages and other Windows.*

Dust screen wherein a piece of cheese cloth, muslin, or other desirable fabric is attached to said sash adapted to be applied to the face of a window opening so as to stretch the fabric across the latter, the said lath being held in position by a transverse lath ranging between them.

389 of 1904.—G. J. COLES: *Locks or Latches.*

Locks or latches, consisting of a pivoted latch weighted to lie in its normal position, and having a projecting end adapted to engage a staple and be moved thereby out of its normal position, and to resume its normal position behind the staple by gravity, and to be locked by a bolt engaging with the latch-bolt.

534 of 1904.—G. ANDERSON: *Window Sash Fittings.*

Window sash fittings, used in combination comprising a sliding plate attached to the sash cord, and carrying a pivoted bell-crank, the arm of which is adapted to be brought over the button rod of the window frame, and a second plate attached to the swinging pin, having an upwardly projecting pin adapted to swivel said bell-crank in swinging open and closing the sash.

064 of 1904.—J. W. EWART: *A Base or Wall Block to Facilitate Erection of Electric Light Fixtures and Provide Better Insulation at their Bases.*

This invention consists of an ordinary wood or other block, to which is fitted a china or other non-conducting core or centre. Upon this non-conducting core are fixed two metal rods having suitable screw terminals, and the said terminals both the line wires and the lighting wires are attached, thus obviating the necessity of the usual hand-made joints beneath the metal base of the electric light fixtures.

18 of 1904.—R. W. HILL: *Chimney and Ventilator Tops.*

This invention relates to chimney and ventilator tops. A chimney and ventilator top, as used in accordance with this invention, is an industrial or conical bonnet, open at the top and having apertures at different points and at different points around the rim. The said apertures communicate between the interior of the bonnet and the external atmosphere. From the lower edge of each aperture is extended inwards and upwards a fixed inclined vane. These vanes are draught entering from without at the apertures and direct it upwards in the bonnet, thus increasing upward draught in the chimney or in a ventilator shaft or ventilator, and the vanes oppose down draught and deflect current to pass out of the bonnet through said apertures.

03 of 1904.—J. E. PRESTON: *Flushing Cisterns for Water-closets and the like.*

Flushing cisterns for water-closets and the like, characterised by the combination with a flushing cistern of a ball, which is mounted upon a vertical guide, and is connected with the valve or cock in such a manner that the valve or cock is actuated by varying level of the water.

23,870 of 1904.—E. W. ROBERTS: *Glazing Bars or Astragals for Roof Lights and Windows.*

This invention relates to glazing bars or astragals, consisting of a steel tee bar with top continuation, entirely coated with an alloy of tin, having a glazing cap of pure lead, the steel bar having two grooves for the reception of packing, which is composed of asbestos.

24,537 of 1904.—F. C. ZACHARIE: *Water-closets.*

This consists in the combination with a ball, a hinged seat, an overhead flushing tank, a chain connecting the seat with the valve of the overhead tank for operating same, and a weight connected with said chain, and arranged to normally hold the seat in a practically vertical position.

24,559 of 1904.—H. G. VOIGHT: *Locks and Latches.*

A device, consisting of two plates arranged to be secured to opposite sides of a door, a knob carried by each of said plates, said knobs being in alignment, a latch slide carried by one of said plates, two roll backs co-acting with said slide, one of said roll backs being operated by one of said knobs, the other roll back being operated by the other knob.

25,380 of 1904.—J. W. HARTMANN: *Wood Columns and the like.*

A hollow column, composed of a series of staves of irregular widths, said staves being of less width at the termini than at a point intermediate thereof, to conform with the desired form of swelled column, each staff having integral locking devices upon each at an oblique angle to the radius, and parallel with the edges thereof.

25,576 of 1904.—A. H. WEGENER: *A Nut Lock.*

A nut lock, consisting in the combination with a bolt of a nut engaging the bolt and having a narrowing recess, the back wall of said recess having a groove corresponding in form to the threads of the bolt, a clutch movable in said recess, and having peripheral surfaces corresponding in form to the threads of the bolt and the groove of said recess, the said clutch being arranged to simultaneously engage the threads of the bolt and groove of said recess.

26,164 of 1904.—F. J. J. GIBSON: *Fastening for a Door.*

A thumb-latch fastening for a door, in which the latch is pivoted to a plate which is adapted to be inserted in a mortice recess formed in the thickness of the door, and be secured to the door by an addition to, or extension of, the plate, which addition or extension covers the orifice of the recess.

26,193 of 1904.—C. W. BROWN (W. F. WARDEN): *Combined Ventilators and Skylights.*

This consists in the combination of a ventilator with a skylight and adjustable damper, said ventilator having vanes or louvers on the sides of the light shaft, and an outer rim or sleeve for protection from the weather, an adjustable damper by which the admission of air can be regulated or stopped without interfering with the light from the skylight.

26,294 of 1904.—E. KENNARD: *Spanners, Turnkeys, or the like.*

A spanner adapted to fit nuts with various shapes or sizes, comprising a lever piece terminating in a spigot or socket of square or other suitable section adapted to fit correspondingly shaped sockets or spigots on one end of a number of socket or key pieces, the other ends of which are adapted to fit nuts of various sizes or shapes.

3,944 of 1904.—E. LINES: *A Stoneware Pipe Joint.*

A spigot and socket pipe joint, consisting in the employment of a slot or slots on the interior of the socket adapted to receive wedges of bituminous or other suitable material between the socket and spigot.

5,553 of 1904.—J. STEWART: *Anti-Flooding or Non-Return Valves for Gully and other Sanitary Traps.*

This invention relates to anti-flooding valves for the prevention of the return of sewage or flood water through gully, intercepting, and other sanitary traps. According to this invention the valve is constructed in the following manner:—A suitably-shaped valve plate is used with a spigot on the underside; on the outer diameter of the spigot a rubber or other suitable ring is fixed; against this ring or seating a hinged flap, with a float on the underside, rises with the flood water and

closes the opening, thereby preventing the flooding or return of the sewage or flood water in the area drained.

7,533 of 1904.—J. COOPER and W. WALKER: *Means for Ventilating and Humidifying Air of Spinning-rooms and other Apartments.*

An apparatus for purifying and humidifying air in spinning-rooms and other apartments, consisting of a trough for containing water, a cover to said trough forming a chamber above the water, endless bands of filtering cloth passing over rollers superposed in said chamber in such positions that the filtering cloth is dipped in the water as the rollers are rotated, a fan or other device for drawing the air through the filtering cloth, covered water troughs for receiving and humidifying the purified air, and air distributors for disseminating the purified and humidified air through the room.

11,523 of 1904.—E. STOFFLER: *Manufacture of Lime and Sand Bricks or Blocks.*

A method of manufacturing bricks or blocks of lime and sand, consisting in mixing sand and caustic lime with the addition of water or steam in open or closed vessels, and in simultaneously grinding the mixture, which is subsequently moulded and hardened with steam.

SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

JANUARY 23.—By GREEN & SON (Hammer-smith).

Shepherd's Bush—Wells-rd., "The Farm," with yards, stabling, and two cottages adjoining, *f.*, s. r. 174s. 2,400
Hammer-smith—11, South-st., also "Spring Cottage," with yards, etc., *c.*, *y.* 120f. 194 to 200 (even), Dalling-rd. (s.), area 5,670ft. *f.*, *w.* 93f. 4s. 1,140
202 to 208 (even), Dalling-rd., area 6,645ft. *f.*, *w.* 97f. 10s. 960
Cardrose-st., *f.*, g. route 71s., reversions from 61 to 69 yrs. 1,660

By F. VARELEY & SON.

Holloway—6, Harvist-rd., *u.* 38 yrs., *g.* 7f., *c.* 42f. 850
Tottenham—2 and 4, Northumberland-gr., with nursery ground, *u.* 45f. yrs., *g.* 10f. 10s., *y.* 45f. 760
By HUNT & PEDDAS (at Needham Market).
Needham Market, Suffolk—High-st., "The Post Office," with two residences and shop adjoining, *f.*, *y.* 30f. 440
Bridg-st., a freehold cottage, *y.* 21f. 260
Ipswich-rd., copyhold business premises, 300
Battisford, Suffolk—"The Vale Farm," 73 a. 0 r. 13 p., *f.*, *y.* 45f. 850
"Plantation Cottage" and 6 a. 0 r. 16 p., *f.*, *y.* 15f. 230

JANUARY 24.—By BROWETT & TAYLOR.

Norwood—5, 11, and 13, Rockmount-rd., *u.* 72 yrs., *g.* 22f. 10s., *y.* 98f. 510
By DAVID BURNETT & CO.
Raynes Park—64, Lambton-rd., *u.* 22f. yrs., *g.* 5f. 6s., *c.* 30f. 270
By C. RAWLEY CROSS & CO.
Mile End—Mile End-rd., the "Coach and Horses" p.h., profit rentals of 80f. for 83f. years, and 10f. for 10f. yrs. 1,125
Plasston—Brooks-rd., the "Gladstone" b.h., and House adjoining, *f.*, *y.* 60f. 920
Upton Park—134 and 136, Neville-rd., *f.*, *w.* 48f. 16s. 420
135 to 143 (odd), Neville-rd., *f.*, *w.* 117f. 11f., 8f. 10s., *y.* 25f. 12s. 1,000
171 and 173, Plashet-rd., *f.*, *y.* 58f. 10s. 500
Bethnal Green—32, Coventry-st., *f.*, *w.* 28f. Shepherd's Bush—230, Goldhawk-rd., *u.* 58 yrs., *g.* 7f., *c.* 73f. 650
Stockwell—7, Hargywnne-st., *u.* 60 yrs., *g.* 8f., *w.* 52f. 285

By ORGILL, MARKS, & LAWRENCE (at Masons' Hall Tavern).

Islington—Upper-st., the "Royal Mail" p.h., *u.* 54 yrs., *y.* 140f., with goodwill 12,700

JANUARY 25.—By FULLER & RUDDOCK.

West Drayton, Middlesex—41 to 44, Warwick-rd., *f.*, *w.* 104f. 950

By A. FREECE & SON.

Wood Green—90, Pellatt-gr., *f.*, *y.* 26f. 300

Norwood—10, Cambridge-rd., *u.* 56 yrs., *g.* 24f., *y.* 28f. 200

JANUARY 26.—By O. C. & T. MOORE.

Mile End—40, 42, 44, and 119, Moody-st., *f.*, *w.* 109f. 4s. 1,040

83, Devonshire-st., *f.*, *w.* 37f. 4s. 425

Bow—1 to 5, Harley-st., *u.* 43 yrs., *g.* 71f., *y.* 207f. 990

Harley-st., *f.*, *g.* 98f. 2s., *u.* 29 yrs., *g.* 83f. 3s. 6d., with reversion 510

Forest Gate—13, Earham-gr., *f.*, *y.* 34f. 490

St. George's East—46, 48, and 48a, Dean-st., *f.*, *w.* 58f. 10s. 800

By NEWSON, EDWARDS, & SHEPHERD.

Holloway—1 and 3, Cardrose-rd., *u.* 63 yrs., *g.* 15f., *y.* 90f. 1,030

Barnsbury—61, Albert-st., *u.* 45 yrs., *g.* 8f., *c.* 30f. 265

Calendon-road—No. 32 (s.), *u.* 30 yrs., *g.* 10f., *y.* 60f. 445

Pentonville—27, Chapel-st., (s.), *u.* 8 yrs., *g.* 22f., *y.* 66f. 170

28 and 29, Chapel-st., *u.* 15 yrs., *g.* 40f., *y.* 130f. 500

Holloway—36, 38, and 40, Campbell-rd., (s.), *u.* 79f. yrs., *g.* 18f., *y.* 93f. 16s. 460

By SIMMONS & SONS.

New Southgate, -43 and 45, Glenhorne-rd., u.t. 77 1/2 yrs. g.r. 11 1/2 yrs. g.r. 54 1/2 yrs.	£350
Brixton, -77 1/2, Coalharbour-lane, u.t. 61 1/2 yrs. g.r. 61, g.r. 60 1/2	490
Old Kent-road, -817, East-st. (a.b.), y.r. 24 1/2, 50, Loder-st., with yard and stabling, u.t. 40 1/2 yrs. g.r. 61, w.r. 85 1/2 yrs.	875
Peckham, -6 to 10, Camden-av., l., y.r. 20 1/2, Stratford, -59, Glenhorne-rd., u.t. 90 1/2 yrs. g.r. 107 1/2, g.r. 65 1/2	8,040
Peckham, -188, High-st. (s.), l., y.r. 60 1/2	960

By G. TROLOPE & SONS.

Belgravia, -56, Belgrave-rd., u.t. 32 1/2 yrs. g.r. 15 1/2	550
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By VARELEY & LOCKING.

Stoke Newington, -220, Amhurst-rd., u.t. 42 1/2 y.r. 81, g.r. 55 1/2	390
80, Wimbush-rd., u.t. 38 yrs. g.r. 61 1/2, 10 1/2, y.r. 34 1/2	350

January 27.—By W. B. HALLITT.

Camberwell, -24 to 32 (even), Camberwell-gt., and 45A and 47, Grove-lane, area 26,700 ft. l., h.r. 60 1/2	9,000
Holloway, -34, Thane Villas, u.t. 46 1/2 yrs. g.r. 7 1/2, h.r. 8 1/2	235

By WAGSTAFF & SONS.

Bechnal Green, -11, Cranbrook-rd., and 16A and 18, Harold-st., u.t. 30 yrs. g.r. 61 1/2, 10 1/2, w.r. 55 1/2	350
46, 48, and 52, Vok-st., w.r. 7 1/2, 6 1/2, also l.g.r. 24 1/2, u.t. 25 1/2 yrs. g.r. 45 1/2, 10 1/2	300
Pitts, Essex, -Station-parade, 10 plots of building land, also land in rear, with building thereon, l.	400

Contractions used in these lists.—E.g., for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; a.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; y.s. for years; l.a. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; g.d.n. for gardens; yd. for yard; gr. for grove; h.b. for hearthstone; p.h. for public-house; o. for office; a. for shops; ch. for court.

TO CORRESPONDENTS.

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We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any communication to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

MEETINGS.

FRIDAY, FEBRUARY 3.

Junior Institution of Engineers (Westminster Palace Hotel).—A paper on "Recent Developments in Electric Lighting" will be read by Professor H. T. Davidge, Wh.Sc. 8 p.m.

SATURDAY, FEBRUARY 4.

Sanitary Inspectors' Association.—Twenty-second annual dinner, Venetian Chamber, Holborn Restaurant. 6.30 p.m.

Incorporated British Institute of Certified Carpenters (London Wall, E.C.).—Mr. G. Ayres on "The Steel Square." 8 p.m.

MONDAY, FEBRUARY 6.

Royal Institute of British Architects.—(1) To announce the name of the person the Council propose to submit as a fit recipient of the Royal Gold Medal, 1905; (2) the President, Mr. John Belcher, A.R.A., to deliver an address to students; (3) Mr. A. N. Prentice to read a criticism of the works submitted for the prizes and studentships 1904-1905; (4) presentation of prizes by the President. 8 p.m.

Society of Engineers.—The President for the past year, Mr. David B. Butler, will present the premiums awarded for papers read during the year. The President for the year 1906, Mr. Nicholas J. West, will deliver his inaugural address. 7.30 p.m.

London Institution.—Mr. M. H. Spielmann, F.S.A., on "The Wallace Collection," illustrated. 8 p.m.
Liverpool Architectural Society (Incorporated).—Mr. J. B. Fulton on "How to Attain Original Thought in Architecture," illustrated by limelight views. 6 p.m.
Glasgow Philosophical Society (Architectural Section).—Mr. D. Cook on "The Relations of Proprietor, Architect, and Contractor." 8 p.m.

TUESDAY, FEBRUARY 7.

Institution of Civil Engineers.—(1) Paper to be further discussed, "Floating Docks," by Mr. L. R. Clark; (2) time permitting, papers to be read: (a) "Afternoon Second Tunnel," by Mr. B. F. Croble Trench, M.A.; (b) "The Reconstruction of Monticelli Tunnel," by Mr. D. McLellan. 8 p.m.
Institute of Sanitary Engineers, Ltd. (Lectures in practical Sanitary Science).—Mr. J. T. Griffin on "Scavenging and Disposal of Refuse." 7 p.m.

Northern Architectural Association Students' Sketching Club.—Mr. J. Bruce on "Stresses in an Iron Roof of 40 ft. span, with all Calculations." 7.30 p.m.
Sanitary Institute.—Conference on School Hygiene, in the University of London. Address by Sir Arthur Rickard, M.A., D. Phil., F.R.S., on "The Development of 'Florence and the Renaissance: The later Development.'" 8 p.m.

WEDNESDAY, FEBRUARY 8.

Sanitary Institute.—Conference on School Hygiene (continued).
Society of Arts.—Mr. R. Child Bayley on "Time Development in Photography, and Modern Mechanical Methods of carrying it out." 8 p.m.

THURSDAY, FEBRUARY 9.

Sanitary Institute (Conference continued).—Schools—"Building and Equipment," 11 a.m. to 4 p.m.; "Sanitary Inspection and Control," 2 p.m. to 4 p.m.
Royal Institution.—Professor W. Schlich, F.R.S., on "Forestry in the British Empire," II. 5 p.m.
Leeds and Yorkshire Architectural Society.—Miss Ethel Charles on "Modern Architecture in London." 6.30 p.m.

Society of Antiquaries.—8.30 p.m.
Institution of Electrical Engineers.—(1) Conclusion of discussion on "Fuel Economy in Steam Power Plants," by Messrs. W. H. Booth and J. B. C. Kershaw; (2) "The Value of Overhead Mains for Electric Distribution in the United Kingdom," by Mr. G. L. Addenbrooke. 8 p.m.

FRIDAY, FEBRUARY 10.

Architectural Association.—Mr. C. S. Spooner on "Church Fittings." 7.30 p.m.
Royal Institution.—Conference on School Hygiene: Training in Hygiene. 11 a.m.
Institution of Civil Engineers (Students' Meeting).—Paper to be read, "The Reconstruction of the Santa Lucia River Bridge, Uruguay," by Mr. P. J. Risdon. 8 p.m.

SATURDAY, FEBRUARY 11.

Junior Institution of Civil Engineers.—The "Coming of Age" Dinner of the Institution will be held at the Hotel Cecil at 8.30 for 7 p.m., the President, Mr. W. H. Lindley, M.Inst.C.E., F.G.S., in the chair.
Incorporated Clerks of Works Association.—Twenty-second annual dinner, Criterion Restaurant. 6.15 p.m.

PRICES CURRENT OF MATERIALS.

* * Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.	
£ s. d.	
1 12 0	per 1000 alongside, in river.
Hard Stocks	
Rough Stocks and	
Grizzles	1 8 0
Paving Stones	2 0 0
Shippers	2 5 0
Flettons	1 8 0
Red Wire Cuts	1 14 0
Best Farman Red	3 12 0
Best Red Pressed	
Ruabon Facing	5 0 0
Best Blue Pressed	
Shedfordshire	4 4 0
Do. Bullnose	4 10 0
Best Stourbridge	
Fire Bricks	4 8 0
GLAZED BRICKS.	
Best White and	
Ivory Glazed	
Stretchers	12 0 0
Headers	11 0 0
Quoins, Bullnose,	
and Flats	16 0 0
Double Stretchers	19 0 0
Double Headers	16 0 0
One Side and two	
Ends	19 0 0
Two Sides and	
one End	20 0 0
Splays, Cham-	
ferred, Squints	20 0 0
Best Dipped Salt	
Glazed Stretch-	
ers, and Header	12 0 0
Quoins, Bullnose,	
and Flats	14 0 0
Double Stretchers	14 0 0
Double Headers	14 0 0
One Side and two	
Ends	15 0 0
Two Sides and	
one End	15 0 0
Splays, Cham-	
ferred, Squints	14 0 0
Second Quality	
White and	
Dipped Salt	
Glazed	2 0 0
Thames and Pit Sand	7 0
Thames Ballast	5 9
Best Portland Cement	per ton,
Best Ground Blue Lime	20 0

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime 12s. 0d. || Stourbridge Fireclay in sacks 7s. 6d. per ton at rly. dpt. | |

STONE.

BATH STONE.—delivered on road wagg. s. d.
Do. do. delivered on road waggons, 1 6 1/2 per ft. cube.

PORTLAND STONE (20 ft. average) 1 8 1/2

Brown Whitbed, delivered on road waggons, Paddington depot, 2 1

White Bedded, delivered on road waggons, Paddington depot, 2 1

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STONE (continued).

Ancoaster in blocks	1 11	per ft. cube, deld. rly. depot.
Beor	1 6	"
Greenhill	1 10	"
Deer Pale	1 10	"
Red Cornhill	2 5	"
Cloeburn Red Freestone	2 0	"
Red Mansfield	2 4	"

YORK STONE.—Robin Hood Quality.

Scrapped random blocks 2 10

6 in. sawn two sides

landings to sizes

(under 40 ft. super.) 2 3 per ft. super.

6 in. rubbed two sides

ditto, ditto 2 6 | " || 3 in. sawn two sides | | " |
slabs (random sizes) 0 11 1/2		"
2 in. to 2 1/2 in. sawn one		"
side slabs (random		"
sizes)	0 7 1/2	"
1 1/2 in. to 2 in. ditto, ditto 0 6		"

HARD YORK.

Scrapped random blocks 3 0 per ft. cube.

6 in. sawn two sides,

landings to sizes

(under 40 ft. super.) 2 8 per ft. super.

6 in. rubbed two sides

ditto 3 0 | " || 3 in. sawn two sides | | " |
(slabs random sizes) 1 2		"
2 in. self-faced random		"
flags	0 5	"

Hopton Wood (Hard Red) in blocks 2 8 per ft. cube.

6 in. sawn both

sides landings 2 7 per ft. super.

3 in. do. 1 2 1/2

SLATES.

in. in. £ s. d.

20 x 12 best blue Bangor 13 2 6 per 1000 of 1200 at rly. depot.

20 x 12 " " 13 17 6

20 x 10 first quality " 13 0 0

20 x 12 " " 13 15 0

16 x 8 " " 7 5 0

20 x 10 best blue Port-

madoc 12 12 6 | " || 16 x 8 " " | 6 12 6 | " |
20 x 10 best T. Trol-		"
ing green	15 17 6	"
20 x 12 " "	18 7 6	"
18 x 10 " "	10 5 0	"
16 x 8 " "	10 5 0	"
20 x 10 permanent green	11 13 6	"
18 x 10 " "	9 12 6	"
16 x 8 " "	6 12 6	"

TILES.

Best plain red roofing tiles. 42 0 per 1000 at rly. depot.

Hip and Valley tiles " 3 7 per doz.

Best Broseley tiles " 50 0 per 1000

Do. Ornamental tiles " 52 0

Hip and Valley tiles " 4 0 per doz.

Best Ruabon red, brown, or

brindled do. (Edwards) 57 6 per 1000

Do. Mansfield " 60 0

Hip tiles " 4 0 per doz.

Valley tiles " 3 0

Best Red or Mottled Stafford-

shire do. (Peaks) 51 9 per 1000

Do. Ornamental do. 54 6

Hip tiles " 4 1 per doz.

Valley tiles " 3 8

Best Mansfield brand

plain tiles 48 0 | per 1000 || Best Ornamental tiles | 50 0 | " |
Hip tiles	4 0	per doz.
Valley tiles	3 8	"
Best "Hartshill" brand		"
plain tiles, sand faced, 50	0	per 1000
Do. pressed	50 0	"
Do. Ornamental	50 0	"
Hip tiles	4 0	per doz.
Valley tiles	3 6	"

WOOD.

At per standard.

Deals: best 3 in. by 11 in. and 4 in. £ s. d.

by 9 in. and 11 in. 13 10 0

Deals: best 3 in. by 9 in. 13 0 0

Battens: best 2 1/2 in. by 7 in. and

8 in. and 3 in. by 7 in. and 8 in. 11 0 0

Battens: best 2 1/2 in. by 6 in. and 3 in. by 6 in. 10 0 0

Deals: seconds 1 0 | 0 less than best || Battens: seconds | 0 10 0 | " |
2 in. by 4 in. and 2 in. by 5 in.	9 0 0	"
2 in. by 4 1/2 in. and 2 in. by 5 1/2 in.	8 10 0	"
Foreign Sawed Boards:		"
1 in. and 1 1/2 in. by 7 in.	0 10 0	more than battens.
2 in.	1 0 0	"

At per load of 50 ft.

Fire timber: best midding Darning

or Mamel (average specification)

Seconds 4 10 0 | 4 10 0 || Small timber (8 in. to 10 in.) | 3 13 6 | 3 15 0 |
Small timber (9 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 10 0	3 0 0
Pitch-pine timber (30 ft. average)	8 5 0	8 15 0

JOINERS' WOOD.

At per standard.

White Sea: first yellow deals,

3 in. by 11 in. 24 0 0

3 in. by 9 in. 22 0 0

Battens, 2 1/2 in. and 3 in. by 7 in. 16 10 0 | 18 0 0 || Second yellow deals, 3 in. by | | " |
11 in.	18 10 0	20 0 0
3 in. by 9 in.	17 10 0	19 0 0
Battens, 2 1/2 in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in.		"
and 9 in.	13 10 0	15 0 0
Battens, 2 1/2 in. and 3 in. by 7 in.	11 0 0	12 0 0

ENFIELD.—For erecting a day-room at Enfield

CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
*Erection of Buildings, etc.	Hampstead Borough Council	Borough Engineer, Town Hall, Hampstead.	Feb. 2
Road Works in Streets and Passages	Manchester Paving, etc., Committee	Surveyor's Office, Paving, etc., Dept., Town Hall, Manchester.	Feb. 4
Pull and rebuild, "The Butchers' Arms," Blackwood	Griffiths Bros.	Landowne & Griggs, Metropolitan Bank Chambers, Newport, Mon.	do.
Drainage and San. Work at "Darkmoor Inn," Lydford	Herefordshire C.C.	C. Cole, Architect, 60, High-street, Exeter	do.
Bridge, Storehouse near Ledbury	Bristol Docks Committee	A. Dryland, County Surveyor, Shirehall, Hereford	Feb. 6
Offices and Dwelling-house, Cumberland-rd., Bristol	Leeds Education Committee	W. W. Squire, Engineer, Cumberland-rd., Bristol	Feb. 6
Cleaning Out Small Reservoir at Hough-End, Bramley	Stockport Corporation	J. Atkinson, Borough Surveyor, Stockport	do.
Repairs to Schools	Farnborough R.D.C.	A. Fairfax, Clerk, 29, Bridge-street, Banbury	do.
Ten Double-deck Electric Trams	Bur U.D.C.	H. Barlow, Council Office, Town Hall, Birr, Ireland	do.
Harshill Stones	Lewisham Borough Council	Surveyor's Department, Town Hall, Catford, S.E.	do.
Sinking, etc., Trail Shaft	G. W. & Midland Ryrs. Joint Comm.	Engineer at Paddington Station, London	do.
Supplies, etc.	Bradford Royal Infirmary	F. Holland, Engineer, 11, Parkinson's-chambers, Bradford	do.
Steel Foot Bridge at Olmister, near Sharpness	Wakefield & District Light Ry. Co.	Belle Isle, Wakefield	do.
Casualty Department, Bollerhouse, etc.	Glasgow Corporation	J. Whitton, City-chambers, 249, George-street, Glasgow	do.
Band	Dartford R.D.C.	A. Greer, Architect, Guildhall, York	do.
Carriage-way in Bellahouston Park	Tillicoultry Town Council	W. Harston, Engineer, Hythe-street, Dartford	do.
Adds, etc., Sch. of Science & Art, Exhib.-bldgs., York	Barnsley Town Council	Buchanan & Bennett, C.E., 12, Hill-street, Edinburgh	Feb. 7
*Drainage Works, Tillicoultry	East Stonehouse U.D.C.	J. H. Taylor, Borough Surveyor, Manor House Offices, Barnsley	do.
2 acres of Storm Water Filters, Monk Bretton	Tirdonkha Collieries	Manager, Tirdonkha Collieries, Swansea	do.
2 miles of Land Drains, etc., Sunnyside Wood	Glamorgan C.C.	F. A. Widdin, Surveyor, Town Hall, East Stonehouse, Devon	do.
Sinking Pit	do.	T. M. Franken, Clk., Glam. County Offices, Westgate-st., Cardiff	do.
12-in. Stone-ware Pipe Sewer, etc.	Asen Guardians	C. Whitwell & Son, Architects, 28, Temple-row, Birmingham	do.
Water-Paved Road and Asphalt Foot Paths	Tiford U.D.C.	W. R. Hargreaves Bourne, Architect, Darlington	do.
Removing Galleries, etc., at Brithdir Council School	Southern Maritime Ry. Co., Ltd.	W. B. R. Electrical Engineer, Barry-street, Iford	do.
Folding Partitions at Seanghyovod Council School	do.	E. Z. Thornton, Secretary, 46, Queen Anne's-gate, S.W.	do.
Alterations, etc., at Llantwit Major Council School	Plews & Sons	do.	do.
Relaying Drains at Workhouse, Erdington	Geopner and Ryos. E.D.C.	W. Harcourt, Engineer, Paddington Station, London	do.
2,400 yds. Concentric Armoured Cable	Great Western Railway Co.	H. T. Blake, Engineer, 44, Broad-street, Ross	Feb. 8
Safety Side Chains	Kingston-on-Thames Guardians	W. H. Hope, Architect, Seymour-road, Hampton Wick	do.
Spiral Springs for Safety Chains	Greenwich Borough Council	Borough Engineer, Town Hall, Greenwich-road, S.E.	do.
Alterations to "Crown Inn," Crakhall	do.	do.	do.
Improvements, Church-street, Bargoed	East Indian Railway Co.	C. W. Young, Secretary, Nicholas-lane, London, E.C.	do.
125 tons of Steel Bridge Girders	do.	do.	do.
Water Supply, Hill Court Estate, Ross	North-Eastern Railway Co.	C. A. Harrison, Engineer, Central Station, Newcastle-on-Tyne	do.
Painting External Wood and Ironwork at Workhouse	do.	R. Entwistle, Surveyor, Charlbury	do.
6,500 ft. super. of 24-in. Tooled Yorkstone	Stoke-upon-Trent Guardians	T. M. Newell, Engineer, Dock Office, Hull	do.
6,500 ft. super. of 3-in. Tooled Yorkstone	Birm'ghm, etc., Dist. Drain'g Board	W. Bell, Architect to Company, York	do.
Hematite Pig Iron	Cardiff Corporation	A. P. Miller, Architect, Frederick-street, Hanley	do.
Materials for Steel Foundry	do.	Board's Office, Tyburn, nr. Birmingham	do.
Brass Boiler Tubes	Staines U.D.C.	W. Harpur, Borough Engineer, Town Hall, Cardiff	do.
Steel Palisade Fencing for Platforms	Chipping Norton R.D.C.	Surveyor's Office, Town Hall, Staines	do.
Painting Station Buildings	Mr. G. Teasdale	R. Entwistle, Surveyor, Charlbury	do.
Three Dwelling-Houses at Middleborough	Barry U.D.C.	T. H. Murray, Architect, Front-street, Consett	do.
3,550 sq. yds. Whinsett Paving, etc., Vic. Dock, Hull	West Ham Council	Rev. A. E. Hutchinson, 13, Alma-villa, Driffield	do.
Warehouse, Offices, etc., Seward-street, Hull	Farnham B.D.C.	W. E. Beacham, Surveyor, Town Hall, Leek	Feb. 9
Four Cottages at Bolton Percy & Conversion of Bldgs.	Woolwich B.C.	F. Sumner, Borough Engineer, Mayes-road, Plumstead	do.
Buildings and Alterations at Workhouse	Dublin Corporation	Spencer Hart, Borough Surveyor, City Hall, Dublin	do.
Stores and Materials	Brighton Corporation	F. J. C. May, Borough Engineer, Town Hall, Brighton	do.
Forming and Metalling Carriageway, Swansea-st., etc.	Bridlington Corporation	J. Lomas, Electricity Works, Quay-road, Bridlington	do.
Paving, etc., Footways, Swansea-st., Menelaus-st., etc.	do.	do.	do.
Iron Footbridge	Rawtenstall Corporation	J. Johnson, Borough Surveyor, Municipal-offices, Rawtenstall	do.
Road Stone	Kilkeny B.D.C.	K. Comerford, Clerk to Council	do.
School, Medomsley-road, Consett	Midland Railway Co.	P. Lockhart, Land Agent, Corby Castle, Carlisle	Feb. 10
Private Street Works, Junction-road	Downham B.D.C.	Mr. Ellis, Stores Superintendent, York-road Station, Belfast	do.
Road Material, Stores, etc.	Tarvin R.D.C.	H. Wayman, Clerk, Union Offices, Downham Market	do.
Electric Lighting in Prince's-parade	East Bedford R.D.C.	H. B. Kilton, Engineer, 20, Cooper-street, Manchester	do.
Electric Lighting in Victoria-rooms	Bedfordshire C.C.	F. Gwillim, Surveyor, Wooley, B.S.O.	do.
Market Hall and Shops, Newchurch-road	Selby U.D.C.	A. Hugh Seabrook, Engineer, Electricity Works, East-st., Barking	do.
Labourers' Cottages	Leigh Corporation	W. J. Jones, Public Offices, Pentre	do.
Dwelling-House and Offices, Head's Nook	Walsby B.D.C.	A. G. Catling, Highway Surveyor, 4, Post Office-lane, Walsby	do.
Stores (for Northern Counties Committee, Ireland)	Cork Corporation	City Engineer's Office, Municipal-buildings, Cork	do.
Materials (Granite, Gneiss, etc.)	Westminster City Council	Works Department, Westminster City Hall, W.C.	do.
A Test Borehole at Waterworks Pumping-Station, Beeston	Trustees, English Baptist Church	R. L. Roberts, Architect, Abercorn	Feb. 11
Hauling Materials	J. Williams	K. Roberts, Wines & Spirits Shipper, Netherth, Wales	do.
Water-tube Boiler, Steam Feed Pump, etc.	Warwickshire C.C.	County Surveyor, 8, Watlington-street, Birmingham	do.
400-hp. High-speed Steam Dynamo, etc.	Durham County Asylum	W. Crozier, County Architect, Shire Hall, Durham	do.
Improvement of a cross street	East Bedford R.D.C.	T. Henry, Surveyor, Bedford	do.
Road Material	Bedfordshire C.C.	County Surveyor, Shire Hall, Bedford	do.
Offices for the City Analyst, etc., Eglington-street	Selby U.D.C.	B. McG. Gray, Engineer, Town Hall, Selby	do.
*Brick and Concrete Sewer	Leigh Corporation	T. Hunter, Borough Engineer, Bank-chambers, Leigh, Lancs.	do.
Chapel and Schoolroom, Maesowmer	Walsby B.D.C.	E. Taylor, Architect, Prospect-house, Lancaster	do.
Excise Bonded Warehouse at Narberth	Wardale and Consett Water Co.	H. Hurd, Town Surveyor, Council Offices, Broadstairs	do.
Cartage of Main Road Material and Labour	Broadstairs, etc., U.D.C.	T. H. Yabbie, City Engineer, 68, Queen-square, Bristol	Feb. 13
Two Iron Verandahs to Cottage Blocks, Sedgfield	Sanitary and Improvement Com.	Borough Surveyor's Office, 493, New Cross-road, S.E.	do.
Granite and Slag	Depford Borough Council	W. Hawkins, Gas Works, Millwood, Todmorden	do.
Road Material and Cartage	Todmorden Corporation	General Manager, 82, Blackfriars-street, Salford	do.
Whinstone	Salford Tramways Committee	C. C. Dolg, Architect, Elgin	do.
Materials	do.	W. R. Copland, C.E., 116, West Regent-street, Glasgow	do.
House and Workshop, Ford-lane, Leacheston	do.	Carolek, Clerk, Wesleyan Church, Westry, Swansea	do.
Steps from Parade to Sands at Louisa Gap	do.	Council's Engineer, Council Offices, Hendon, N.W.	do.
Paving, Bristol	do.	J. B. Fairchild, Surveyor, Pottersbury, Stony Stratford	Feb. 14
Two Vans for Infected and Diseased Articles	do.	do.	do.
Two Purlins at Millwood Works	do.	do.	do.
Materials	do.	do.	do.
Scottish and Jerningham at Moss-terrace, Elgin	do.	do.	do.
Wesleyan Church and School, Corfe Castle	do.	do.	do.
*Works and Materials (One Year)	do.	do.	do.
Granite and Slag	Hendon U.D.C.	do.	do.
Team Labour	Pottersbury R.D.C.	do.	do.
A 500-kw. Direct-current High-speed Generating Set	Bury Electricity Committee	S. I. Watson, Engineer, Electricity Works, Bury	do.
Gas Mains	Bangor U.D.C. (Co. Down)	E. L. Woods, Town Surveyor, Town Hall, Bangor	do.
Water Mains	do.	do.	do.
Reconstruction of Pier Head, Bangor, etc.	South Parade Pier Co., Southsea	F. W. Chambers, Secretary, South Parade Pier, Southsea	do.
Business Premises, Ferryquay-street, Londonderry	Mr. A. Daly	J. P. McGee, Engineer, Council Offices, Londonderry	do.
*Generating Station at South Kensington	H.M. Office Commissioners	H.M. Office of Works, Storey's-gate, S.W.	do.
*Road and Sewer Works	L.C.C.	Architect's Department, 19, Charing Cross-road, W.C.	do.

Tenders to
be Delivered

Buildings at Purification Works	Combination of Rother Distillers	C. C. Dolg, Architect, Elgin	Feb. 15
Limney Stairs	do.	do.	do.
Concrete Reservoir, etc.	do.	do.	do.
Materials, etc.	Plymouth Corporation	F. Howarth, Water Engineer, Municipal Offices, Plymouth	do.
21-cv. Tramway	Stockport Gas, etc., Committee	A. J. H. Carter, Borough Electrical Engineer, Millgate, Stockport	do.
400-hp. Steam Dynamo	Leith Corporation	Burgh Electrical Engineer, Council-chambers, Leith	do.
Water-tube Boiler	do.	do.	do.
Traction Switchboard	do.	do.	do.
Tools and Stores	East Indian Railway Co.	C. F. Young, Secretary, Nicholas-lane, London, E.C.	do.
Four 15-in. Pipes (5,700 and 6,000 tons), and Valves, etc.	Merthyr Tydfil U.D.C.	G. F. Deacon, Engineer, 18, Gt. George-street, Westminster, S.W.	do.
Four-Dressing Machine, Cornwallis-road Workhouse	Guardians, St. Mary, Islington	E. Davey, Clerk, St. John's-road, Upper Holloway, N.	do.
Lead Materials	Great Oulton Works, Great Horton	J. H. B. Smith, Esq., 33, Edinboro'-street, Leeds	do.
Church of St. Andrew, Great Horton	Great Horton Industrial Society, Ltd.	J. Drake & Son, Architects, Queensbury	do.
Church of St. Andrew, Church, Kildare	do.	W. H. Byrne & Son, Architects, 20, Suffolk-street, Dublin	do.
Trichurch Tramway Extension	Bournemouth Town Council	F. W. Lacey, Borough Engineer, Municipal Offices, Bournemouth	do.
Lead Works, Chadderton	Onest R.D.C.	A. M. G. O. Evans, Esq., 10, St. George's-street, Grimsby	do.
Supply of Road Materials, Royal Parks	Commissioners of H.M. Works, etc.	H. C. Scapling, Architect, Town Hall-square, Grimsby	do.
Convenience at Heaton-park	Manchester Parks Committee	H.M. Office of Works, Storey's-gate, S.W.	do.
Travelling Locomotive	East Bedford Borough Council	W. Atkinson, Town Hall, Manchester	Feb. 16
Convenience at Heaton-park	Wolverhampton Sewerage Com.	J. D. Kennedy, Borough Surveyor, Wolverhampton	do.
Travelling Locomotive	Canterbury Roads Committee	A. C. Turley, City Surveyor, Guildhall-street, Canterbury	do.
Convenience at Heaton-park	Sheffield Improvement Committee	G. W. Atkinson, Esq., 10, St. George's-street, Grimsby	do.
Travelling Locomotive	Sheffield Highway Committee	C. E. Wike, City Surveyor, Town Hall, Sheffield	Feb. 17
Convenience at Heaton-park	Horncastle R.D.C.	J. E. Chatfield, Architect, Offices, Horncastle	do.
Travelling Locomotive	Atcham Guardians	W. H. Bettle & W. Hope, Archts., 33, Grainger-st., W. New-Ct.	do.
Convenience at Heaton-park	H.M. Office of Works	A. B. Deakin, Architect, Fridge-hill, Shrewsbury	do.
Travelling Locomotive	Richmond Town Council	J. Wager, H.M. Office of Works, Storey's-gate, S.W.	do.
Convenience at Heaton-park	Horncastle R.D.C.	R. H. Brierley, Borough Surveyor, Town Hall, Richmond, Surrey	Feb. 18
Travelling Locomotive	Leek U.D.C.	W. J. Brierley, Borough Surveyor, Town Hall, Richmond, Surrey	do.
Convenience at Heaton-park	Nottingham Water Committee	R. M. Carr, Engineer, Electricity Works, Leek	Feb. 20
Travelling Locomotive	Nottingham Water Committee	W. B. Starr, Architect, 12, St. Peter's-gate, Nottingham	do.
Convenience at Heaton-park	Nottingham Water Committee	W. B. Starr, Architect, 12, St. Peter's-gate, Nottingham	do.
Travelling Locomotive	Nottingham Water Committee	W. B. Starr, Architect, 12, St. Peter's-gate, Nottingham	do.
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Convenience at Heaton-park			

Application

Engineering Assistant	London C.C.	500%	Feb. 20
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Public Appointments. xlx

LUTTERWORTH.—For Lutterworth Police Court.
Mr. S. Perkins Pick, County Architect, 6, Millstone-lane,
Leicester:—
J. Bagnall & J. Bentley &

[illegible]

LONDON.—For paving works in new streets, viz., Widley-road, Wymering-road, and Castellain-road, for the Paddington Borough Council. Mr. E. B. Newton, Town Surveyor:—

	Widley-road.									Wymering-road.									Castellain-road.									Widley-road.									Wymering-road.									Castellain-road.								
	A. Flint.			B. Gravel.			C. Granite.			A. Flint.			B. Gravel.			C. Granite.			A. Flint.			B. Gravel.			C. Granite.			A. Flint.			B. Gravel.			C. Granite.			A. Flint.			B. Gravel.			C. Granite.											
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.															
damst.....	1,006	10	10	1,061	5	10	1,170	15	10	1,177	10	10	1,241	15	10	1,370	5	10	1,848	4	11	1,957	9	11	2,175	19	11	1,032	6	7	4,260	11	7	4,717	1	7	9																	
oyer.....	1,501	0	10	1,522	10	31	1,589	6	9	1,716	10	0	1,876	15	10	2,843	10	0	6,299	7	6	6,239	10	0	9,229	10	0	6,916	17	5,837	16	5,382	7	16	5,382	7	16																	
owles.....	1,417	19	21	1,481	16	8	1,561	6	8	1,668	8	4	1,732	13	41	1,861	3	4	2,768	1	8	2,887	6	8	2,996	11	2,854	9	2,610	16	8,649	1	8	8,649	1	8																		
Wright & Co.,	1,520	0	10	1,425	0	10	1,569	0	0	1,765	0	0	1,542	0	0	1,800	0	0	2,080	0	0	2,487	0	0	2,778	0	0	1,933	0	0	5,554	0	0	5,145	0	0																		
Wright & Son	1,178	0	10	1,220	0	10	1,378	0	0	1,545	0	0	1,437	0	0	1,609	0	0	2,473	0	0	2,391	0	0	2,582	0	0	1,939	0	0	4,958	0	0	5,567	0	0																		
Paterson.....	1,469	8	41	1,432	18	41	1,578	18	4	1,720	15	10	1,677	19	21	2,849	5	10	2,715	7	11	2,642	11	3	2,632	17	11	5,905	12	15,763	8	9,362	2	1																				
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‡ Withdrawn.

SOUTHALL.—For making-up roads, for the Southall-Norward Urban District Council. Mr. R. Brown, Engineer and Surveyor, Public Offices, Southall:—

	Abbott's-road.	Adelaide-road.	Beechcroft-avenue.	Clifton-road.	Endsleigh-road.	Oswald-road.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Carpenter & Co., Ltd.	1,386 16 8	249 6 10	632 16 9	560 13 9	647 10 8	1,213 18 3
Fry Bros.	1,706 17 0	342 4 8	798 1 2	701 5 10	905 11 9	1,459 1 10
W. H. Wheeler	1,520 11 0	322 6 3	735 6 0	617 13 0	751 5 0	1,351 9 2
T. Free & Son	1,450 0 0	340 14 2	693 3 2	688 9 9	820 12 3	1,272 16 2
Boyer	1,806 14 11	392 13 11	863 4 10	718 5 11	895 11 2	1,578 8 6
Thacker	1,578 12 4	342 12 0	764 18 5	809 17 1	782 8 6	1,352 13 0
J. Macklin	1,612 3 0	351 0 3	760 11 0	692 8 6	791 10 5	1,400 16 8
Bowyer	1,709 2 8	337 13 6	791 10 0	726 12 9	1,041 2 0	1,497 0 0
A. & B. Hanson, Southall	1,434 11 8	282 2 4	677 10 7	694 13 0	832 13 10	1,210 0 0
T. Watson, Junr., Southall	1,388 15 8	201 1 10	656 10 0	602 15 4	783 13 10	1,221 10 3
H. Mowcroft, Acton	1,594 0 0	274 0 0	689 0 0	651 0 0	797 0 0	1,361 0 0
W. Neave	1,611 15 9	328 17 1	779 1 10	664 7 4	819 6 8	1,397 12 6
Nowell & Co.	1,594 5 8	303 1 1	746 17 8	631 2 4	776 5 4	1,357 7 6
Mowlem & Co.	1,594 5 8	292 5 11	682 0 0	623 0 0	740 15 11	1,239 0 0
T. Adams	1,595 13 0	286 5 4	708 16 6	614 3 2	755 16 5	1,311 18 4

LUDLOW.—For sewerage works for the Town Council. Mr. Henry Percy Maybury, engineer, Monkstone, Buckland-road, Maidstone, Kent:—
E. Boore ... £4,933 19 4
R. Davis ... £2,818 18 6
H. Horner & H. Holloway, Mand ... 4,675 17 4
H. Roberts ... 8,511 10 0
J. A. Meredith ... 2,587 0 0
Wolverhampton ... 2,569 0 0

OVER.—For alterations and additions to school buildings, High-street, Over, for the Administrative Sub-Committee for the Winsford and Middlewich District. Mr. H. Bewick, County Architect, Newgate-street, Chester:—
J. Williams & Sons ... £4,963 3 7
W. Dickinson & Sons ... £4,338 10 0
Exors. of H. Sergeant ... 4,948 0 0
T. W. Meadows ... 4,764 0 0
J. Mayers & Son ... 4,589 14 0
S. Robinson & Sons ... 4,190 0 0
J. Fowles & Sons, Winsford ... 3,948 0 0

OXFORD.—For the erection of a cricket pavilion, Cowley-road, for Jesus College, Oxford. Mr. R. England, Oxford, estates surveyor for Jesus College:—
S. Hutchins & Sons ... £1,375
T. H. Kingierle & Sons, Oxford ... 1,263

SHERINGHAM (Norfolk).—For new premises, for the International Tea Company. Messrs. Carter & Co., architects and surveyors, Railway-approach, Sheringham:—
C. T. Baker, Ltd. ... £895
J. W. Weston ... £868
W. Catton ... 745
A. Sadler ... 649
W. Porter ... 730
G. Riches ... 629
H. Bullen ... 700
Blyth & Son ... 571

SHERINGHAM (Norfolk).—For premises, for Mr. Edmonds. Messrs. Carter & Co., architects and surveyors, Sheringham:—
W. Porter ... £1,030
W. Catton ... £1,753
J. W. Weston ... 1,825
A. Sadler ... 1,430
G. Riches ... 1,800
Blyth & Son ... 1,405

SUTTON-IN-ASHFIELD (Notts).—For the erection of the New Market Hotel to be situated in the Market-place, for Messrs. The Home Brewery Company, Limited. Mr. Fred. C. Martin, architect, Angel-row, Nottingham:—
J. Keeling ... £2,511
C. J. Percival ... £2,170
A. Eastwood & Co. ... 2,600
J. Greenwood ... 2,149
C. Vallance ... 2,230
Evan Bros. ... 2,070
T. Messon ... 2,150
W. Maule & Co. ... 2,030
J. H. Vickery ... 2,175
Nottingham ... 2,030

B. NOWELL & Co.,

Stone Merchants & Contractors.
Chief Office.—*Warwick Road, KENNINGTON.*
Norway, Guernsey, and Leicestershire
Granite, Kerb, Pitching, and
Yorkshire Stone.

ESTIMATES GIVEN FOR EVERY DESCRIPTION OF ROAD MAKING.

THE BATH STONE FIRMS, Ltd.

BATH.
FOR ALL THE PROVED KINDS OF
BATH STONE.
FLUATE, for Hardening, Waterproofing,
and Preserving Building Materials.

HAM HILL STONE.
DOULTING STONE.
The Ham Hill and Douling Stone Co.
(Incorporating the Ham Hill Stone Co. and G. Track and Son, The Douling Stone Co.)
Chief Office:—Norton, Stoke-under-Ham,
Somerset.
London Agent:—Mr. E. A. Williams,
16, Craven-street, Strand.

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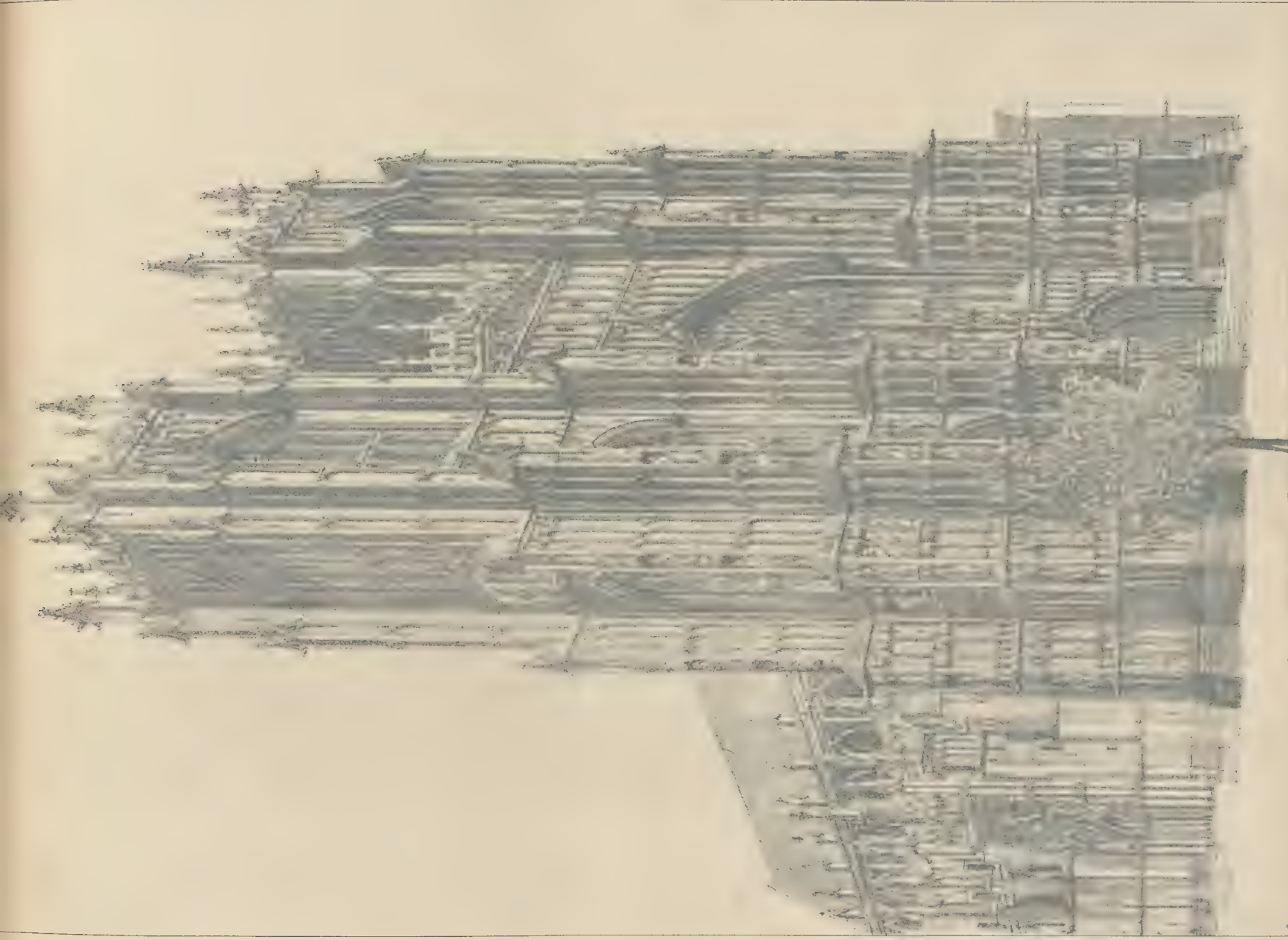
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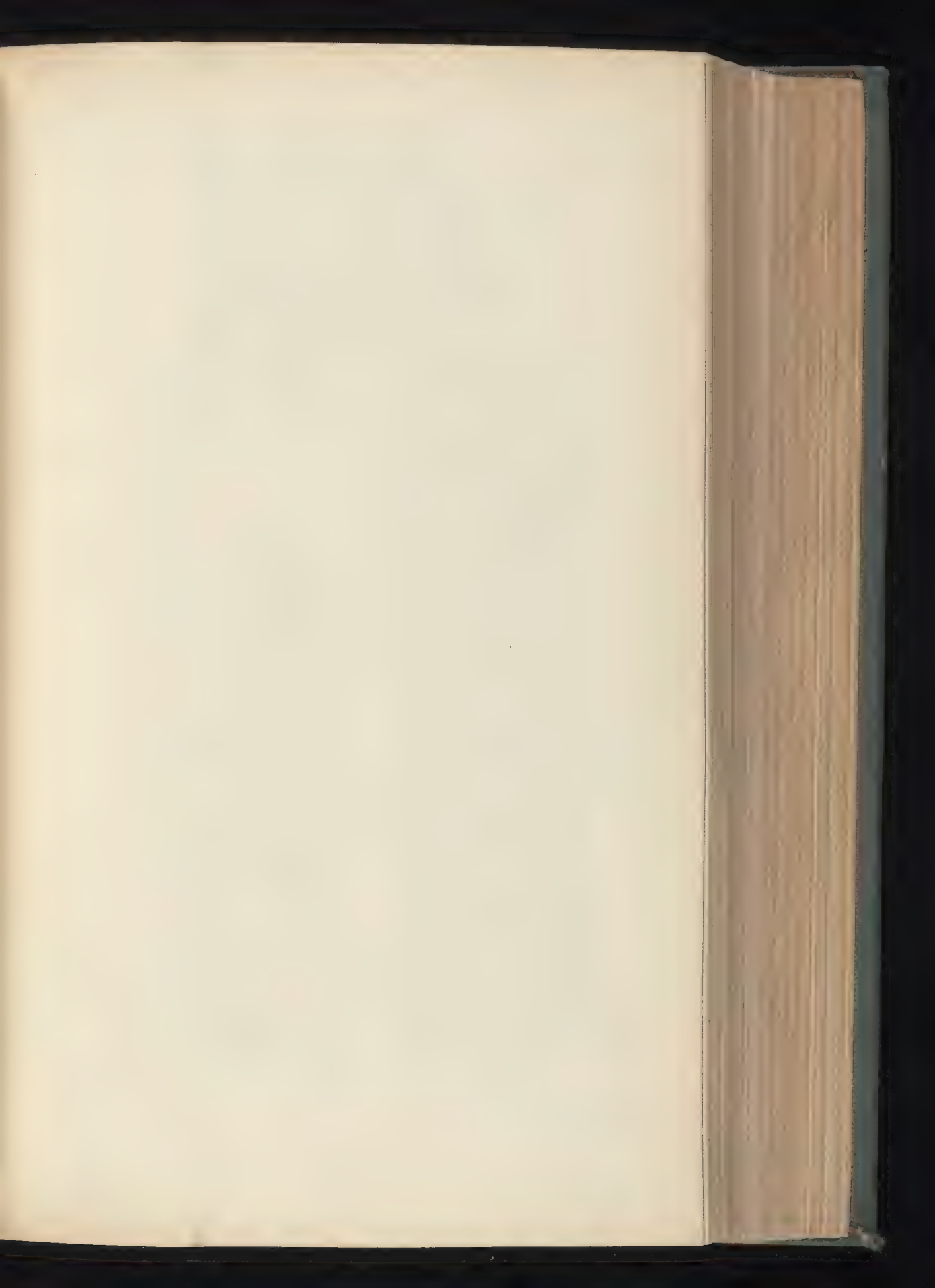


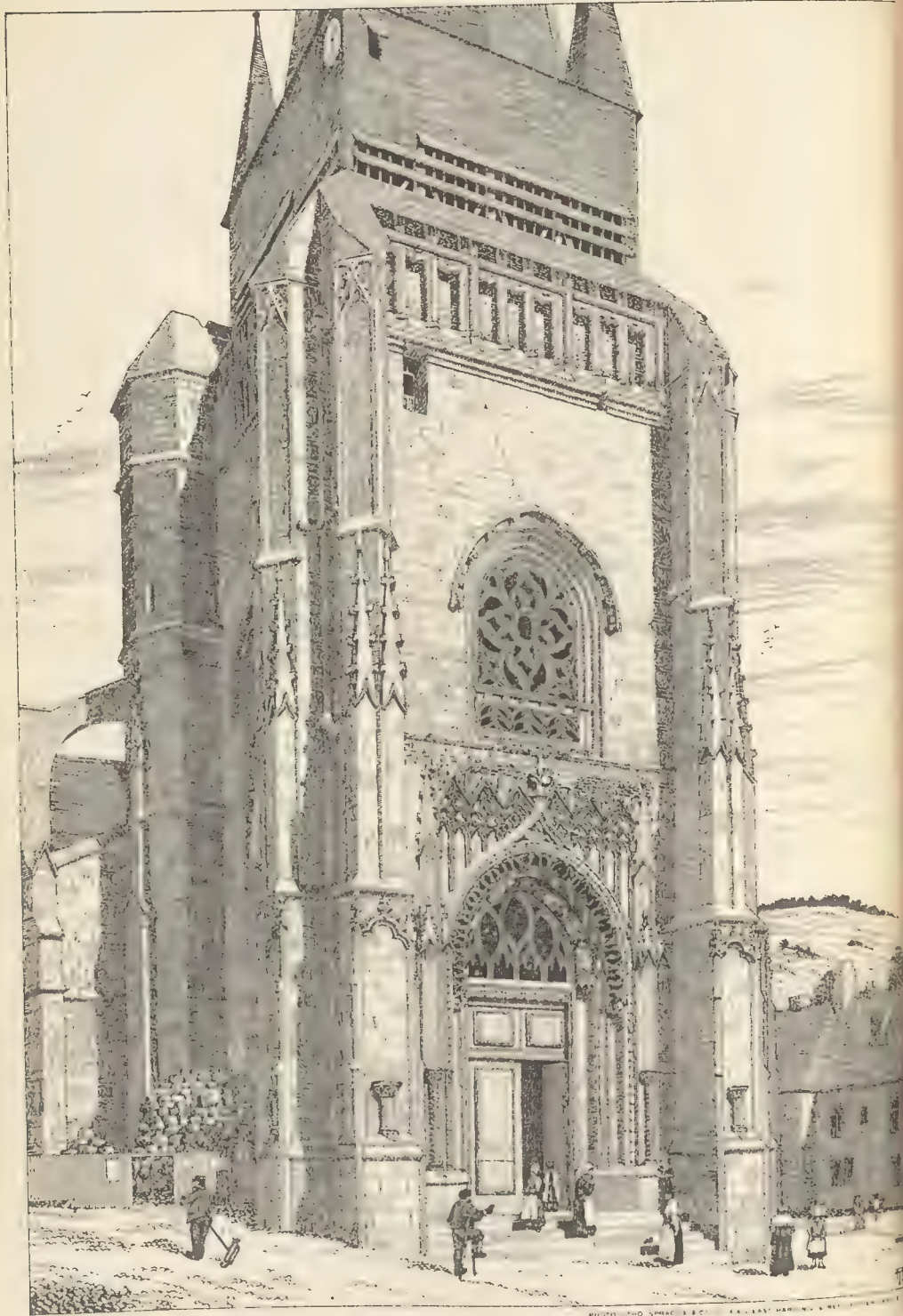
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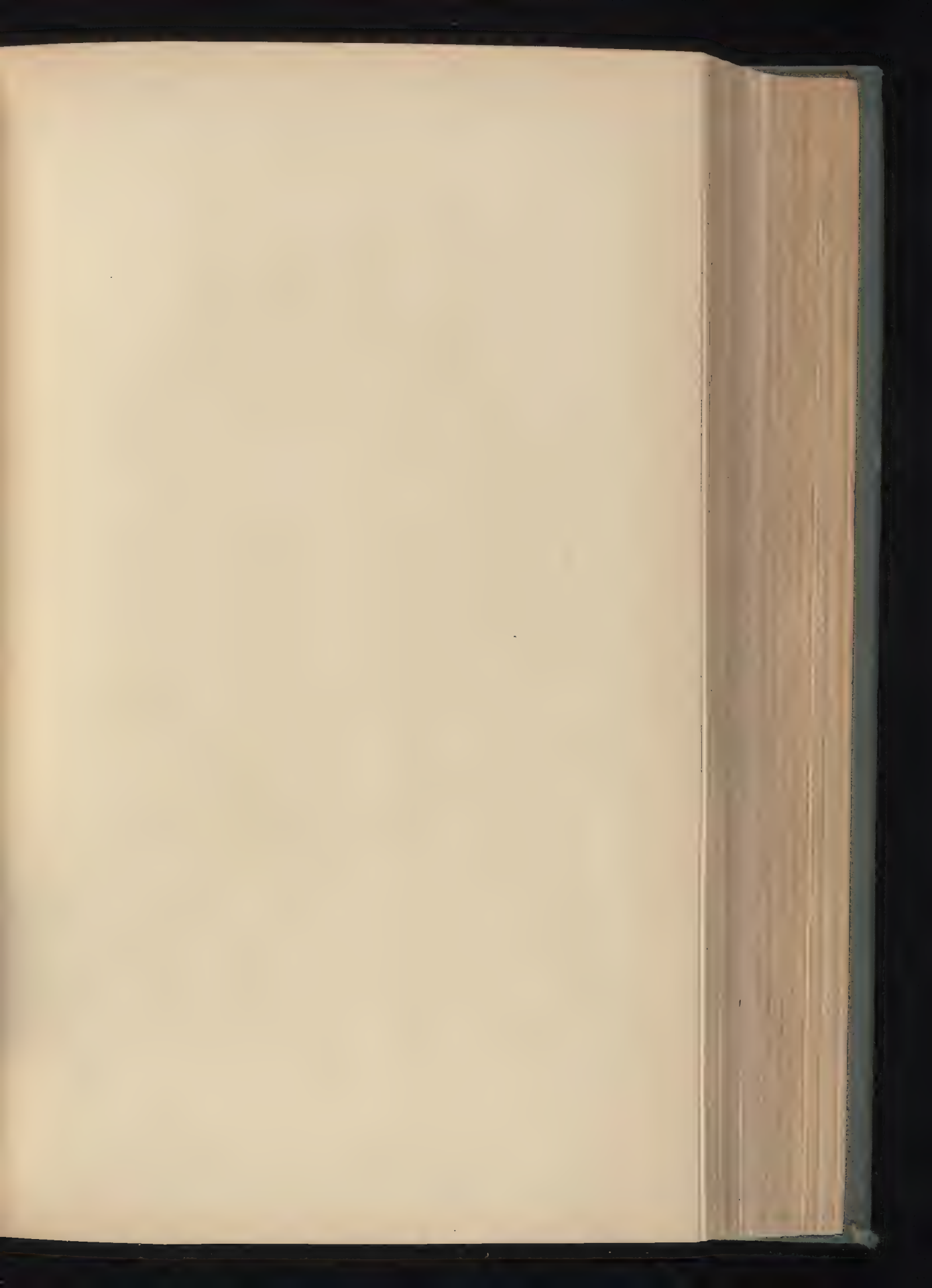
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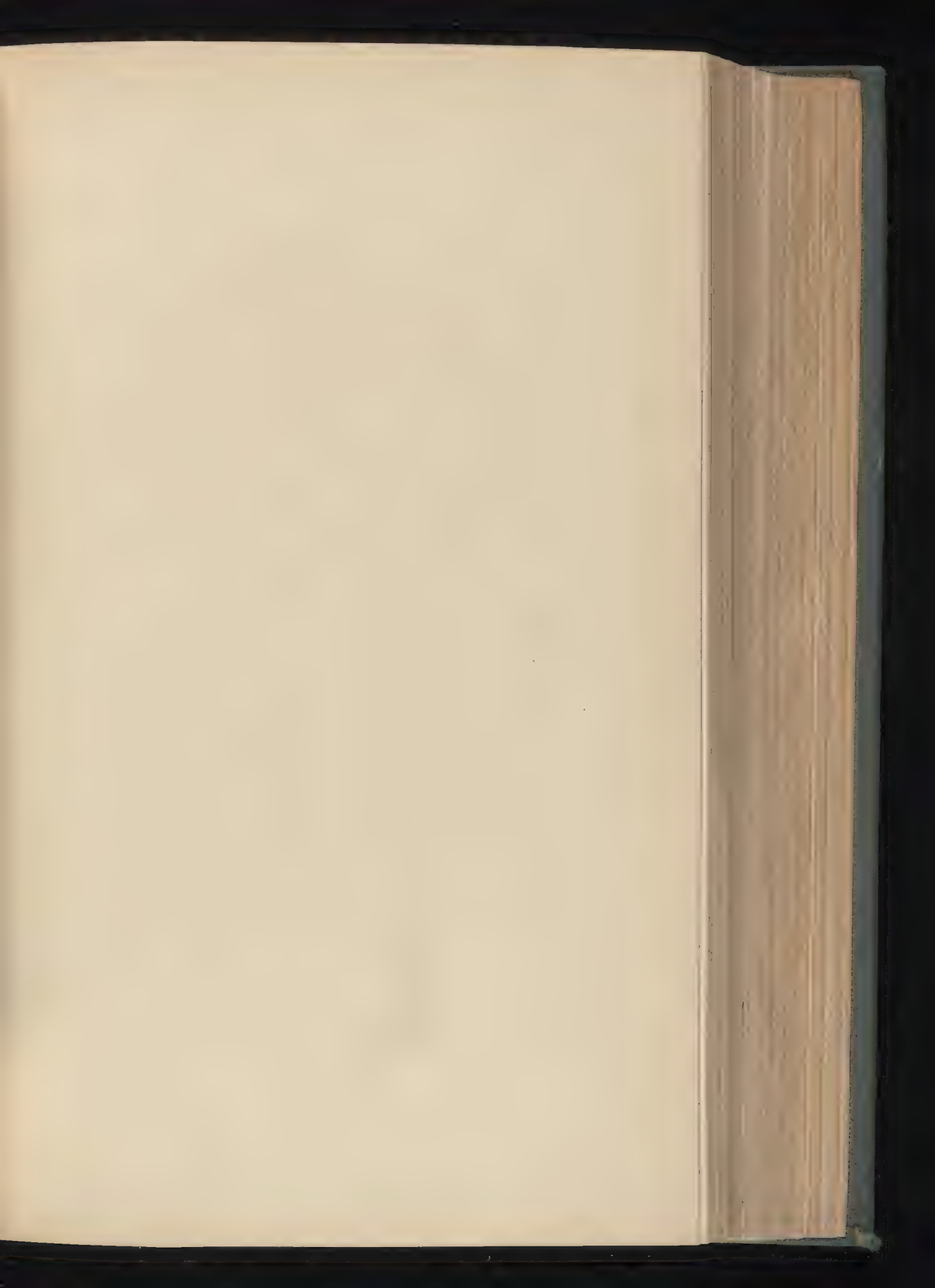
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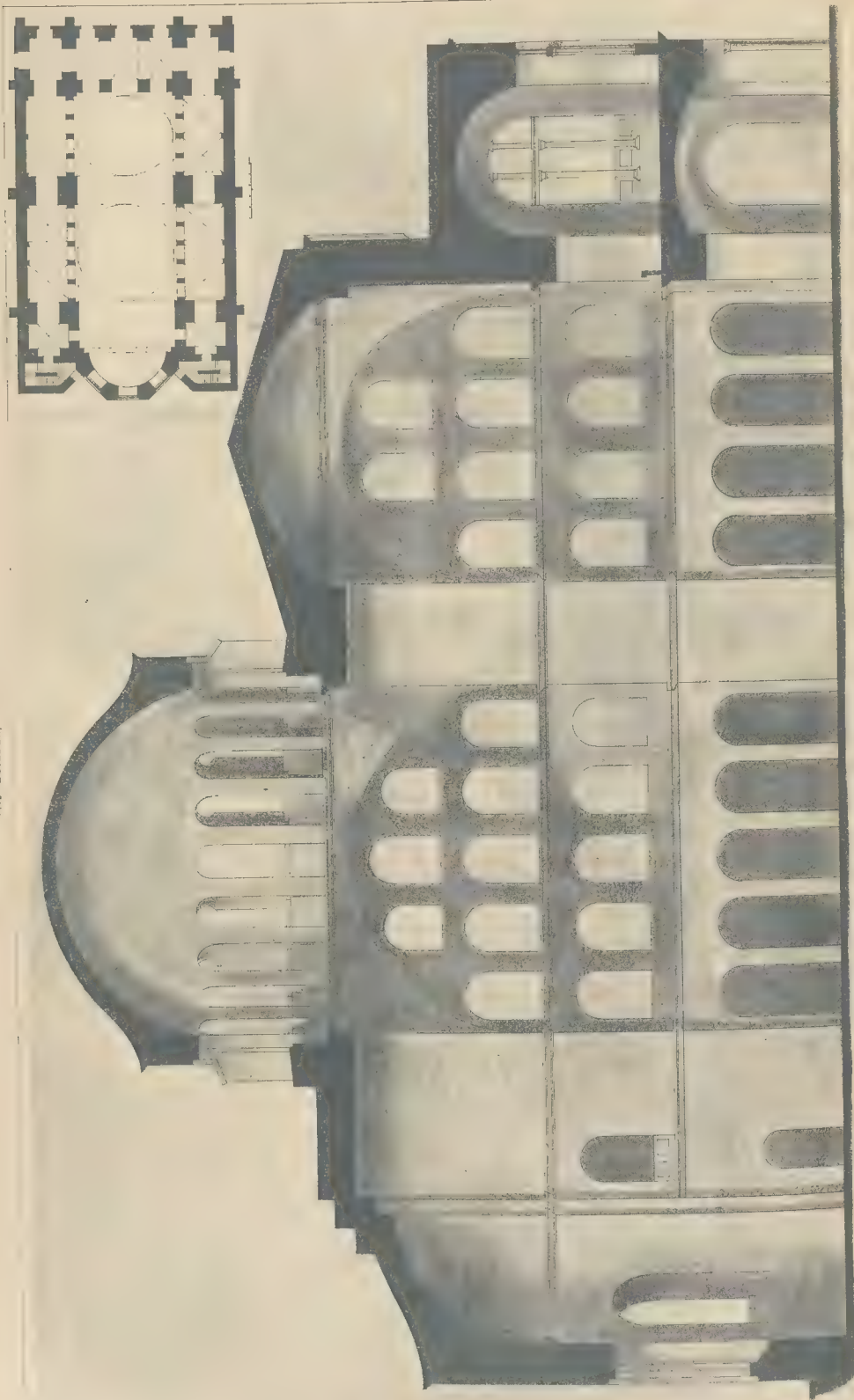


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The Builder.

VOL. LXXXVIII.—No. 3228.

FEBRUARY 11, 1905.

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The Control of Street Architecture.

HE protest recently made by several architects and artists in regard to the intrusion of very lofty buildings into the Strand has directed public attention again to the subject of the relation of street architecture to its surroundings, and the possibility or desirability of some official control being exercised over it, so as to prevent individual owners from intruding into the general design of a street anything which may be out of keeping or out of scale with it.

In regard to scale, however, there is more than one sense in which the word may be used. It may be the actual size of a building (which seems to have been the meaning in the protest referred to), or it may mean relative proportion of features. There is, moreover, a third kind of scale in street architecture, which is perhaps the most important of all, but which the memorialists referred to did not mention—viz., the relation between the height of the houses and the width of the street. To have buildings carried to a height greater than the width of the roadway is what spoils the proportions of a street. We have no measurements, but this proportion seems not to be exceeded in the case referred to, and the building next to the Gaiety Theatre strikes us as rather a fine one, and one is glad to see a boldly treated cornice pro-

jecting (by special grace we presume) far beyond the timid limits of the Building Act.

The important question, however, is, whether we are to seek for architectural uniformity and symmetry in street design, and, if so, how we are to ensure either getting it in the first instance or maintaining it afterwards. Our own most decided opinion is that nothing like the architectural dignity worthy of the streets of a capital city is to be attained without the subordination of individual tenements to a general architectural design. The London County Council had one glimpse of this fact when they arranged competition for designs for the new streets; but, having thus initiated a really fine idea, they took fright at once at the idea that the compulsion to a line of frontage would render the letting of separate properties more difficult. Money rules everything both with the official authorities and with the greater part of the public. If shops will not let fast enough when they are grouped under a comprehensive architectural scheme, the architectural scheme must be abandoned. And so it has happened with the few previous attempts which had been made in London to carry out a comprehensive design for a street. Regent-street was a well-intended and, for its day, a great effort. Its design has been ruined that owners may make higher profits. All the circuses (what the French call "rond-points") at the meetings of main streets have lost, as H. W. Brewer long ago pointed out, their "circus" character, their curves being all cut up by arbitrary

excrescences. The few efforts we have made at dignified street architecture we cannot keep; anyone is allowed to spoil them as he pleases.

How do they do it in Paris, a capital which, as everyone knows, is far more stately and symmetrical in her principal streets and squares than ours? How is it that the Place Vendôme, the Rue de Rivoli, and other streets and squares of the same class are not cut up and spoiled as our humbler efforts are? Simply because people are not allowed to do it. The buildings in such streets and squares are under what is called a "servitude," an official control to which private owners must submit. Thus the owner who wanted to raise his houses in the Place Vendôme, and thereby break up the design of the square, was powerless to do so; the design was under the protection of a servitude dating from the time of Louis XIV., when the square was built. The "servitude" of the Place des Victoires dates from November, 1691, that of the Place des Vosges from July, 1605; that of the Place de la Concorde and the Rue Royale was imposed by letters patent of June 21, 1757. For the Rue de Rivoli, the Rue Castiglione, and the Place du Palais Royal, the servitude was fixed by Consular decrees of 17th Vendémiaire and 1st Floréal, year X. Thus is the symmetry of Parisian architecture protected.

Surely it is time that we had some similar authority over street architecture in London; one which would not be swayed from its purpose by commercial considerations of the letting of property.

THE CRUX OF THE TRILITHON AT BAALBEK.

By MR. R. PHILIP SPIERS, F.S.A.



ONE of the most singular facts in connexion with the history of Baalbek is the entire absence of any contemporaneous accounts of the magnificent works which were carried out in that city by the Romans. The same remark applies to other Roman towns, and to the temples, colonnaded streets, and public monuments built throughout Syria, the only records as to their authors being found in inscriptions occasionally carved on the buildings themselves. In Rome itself all that would appear to have been known of Baalbek is found in representations on the reverses of coins of the IInd and IIIrd centuries. These representations of the temple and other buildings are identified by the letters H. E. L., signifying Heliopolis, the Greek name given to Baalbek, and, from what remains of the actual buildings, we are able to recognise that which they are intended to convey. The earliest record otherwise is found in the writings of John of Antioch (quoted in Wood's preface to the monographs of Baalbek published by Dawkins & Wood in 1757), surnamed Malala, which states that "Ælius Antoninus Pius (138-161 A.D.) built a great temple at Heliopolis, near Libanus, in Phœnicia, which was one of the wonders of the world."

Antoninus Pius is known as one of the greatest builders throughout Syria, and the truth of this attribution of the Temple of Baalbek to him is further corroborated by inscriptions on the pedestals of the propylæa stating that "two columns and their capitals were erected and carved to the memory of Antoninus Pius," a dedication which could only have been made on the assumption that the main portion of the acropolis was the work of that emperor. Such inscriptions are frequently found in ancient work, it being the custom to record them in favour of great benefactors.

The propylæa and the towers which flank them are said to have been built by Caracalla, but its substructure and that of the whole of the acropolis, excepting the smaller temple on the south side, is probably the work of Antoninus Pius, whose megalithic masonry rises some 30 ft. above the ground.

The earliest coins known with representations of the buildings at Baalbek are two of Septimius Severus (193-211 A.D.), showing the great temple; the latest one of Valerian (253-261 A.D.), in which the two temples are shown. There are intermediate coins of Julia Domna, Caracalla, Geta, Philip the Elder, and Otacilia showing the temples and the propylæa. To some of these we shall refer later on.

The representations on these coins suggest that the works commenced by Antoninus Pius were continued during the reigns of these emperors. But, as Antoninus Pius died in 161 A.D. and the accession of Septimius Severus was in 193 A.D., there is a gap of at least thirty-two years, during which there may have been a temporary cessation. One of the coins of Septimius Severus, however, suggests in its design a slight change which had

taken place in the podium, and that "the crux of the trilithon*" had already been solved, but not in the way which was originally contemplated.

Although Wood, in his preface, made no attempt to solve the problem, he is the only writer who has recognised that the trilithon was part of the die of an immense podium, or platform, on which the temple was to stand; he was also of opinion that this scheme was never carried out, and that the stereobate wall carrying the peristyle was probably left in its present condition. No other writers, so far as we know, have entered into the subject, and the accounts given in the guide-books are either vague or incorrect. The statements, for instance, that the foundations and other parts of the structure are præ-Roman are quite imaginary; the scheme of the acropolis, its propylæa, hexagonal and rectangular courts, and the great temple could only have been conceived by one man, and Ernest Renan's suggestion that the triple course under the plinth course of the trilithon might have been the work of the Seleucids cannot be accepted in view of the fact that this triple course is carried round the entire structure. Moreover, although at Damascus Seleucus Nicator is supposed to have erected portions of the temple now incorporated in the Great Mosque, Baalbek is never referred to. That the acropolis is built on the site of many successive temples of Baal is accepted as a matter of history, but here, as elsewhere throughout Syria and Asia Minor, the Romans would seem to have swept away all earlier work, removing even the foundations, so that not a vestige of the same is to be found on the site.

We propose in this article to deal only with the great temple dedicated to Jupiter, the Sun God, and to show its connexion with the trilithon, the three immense stones on the west side and in the rear of the temple. Fig. 1 is a reproduction from a photograph of a drawing made by Achille Joyau, grand prix de Rome, in 1865, showing the *état actuel* of the site. As during the last few years the excavations made by the Germans have brought to light many unknown features, with which we may deal in a future article, it will be of value to place on record the actual condition of the site in 1865, for comparison with that published by Dawkins & Wood, who visited and measured the buildings in the middle of the XVIIIth century, and in anticipation of the German publications on the subject which will probably soon be published. Already, two and a half years ago some plans, elevations, and sections were published in the Berlin archaeological journals, and it was thought that they had completed their researches in the beginning of 1902. Apparently, however, the extremely complex nature of the problem they hoped to solve in 1902 has called for fresh researches, and they were still at work in the commencement of last year, having given strict instructions that no one should be allowed to take photographs of the buildings as they now stand. The

* The Trilithon is the name given to the three immense stones measuring, respectively, 62 ft. 7 in., 61 ft. 8 in., and 63 ft. 4 in., placed end to end, with joints so accurate that it is impossible to insert the blade of a knife between them; 14 ft. high, 11 ft. to 12 ft. thick, and raised to a height of 25 ft. above the ground.

drawings and photographs which they have already published, taken in conjunction with Joyau's drawings, of which the photographs are in our possession, give an exact representation of all that remains of the great temple and its immediate surroundings, so that there is now sufficient authority to attempt conjectural restoration of the same, including that problem which is the title of our article. From Joyau's plan it will be seen that the great temple is placed at the rear of an immense artificial acropolis which, failing the eminence afforded by a natural hill as at Athens, the Romans built as an approach to the temple. The total length of the site occupied by the acropolis from the front of the steps which led to the propylæa (raised some 25 ft. to 30 ft. above the ground) to the wall in the rear which carries the trilithon is 845 ft. The width across the great court, and exclusive of the smaller temple, is 394 ft. The site on which it was built was a fairly level one, with a fall from east to west of about 10 ft. to 12 ft. The pavement of the hexagonal and great court is 2 ft. below that of the propylæa, and the ground beneath these courts is filled in solid; under the propylæa and the great courts and porticoes which surround the same are vaulted corridors and cellars.

The smaller building on the left is known as the Temple of Jupiter. It was built quite independently of the acropolis, and was approached by a flight of thirty-five steps, all of which have been found by the Germans embedded in the Mahometan building on the extreme left. This temple, in our opinion, formed no part of Antoninus Pius's work.

Coming now to the immediate subject of this article, Fig. 2 gives the plan of the great temple taken at the level of the stereobate or foundation wall which carried the peristyle of fifty-four columns; the greater portion of this wall still exists. The plan also shows the trilithon, the plinth on which it is built, its continuation to right and left, and its return on the north and south sides up to the platform of the great court. The dotted lines represent the Mahometan work built when the acropolis was converted into a fortress. The west elevation shows the remains of the work carried out by the Romans. The longitudinal and transverse sections show the relative height of the walls carrying the peristyle—of the plinth course on the north, south, and west sides, and the trilithon carried on the latter. The stereobate wall is 8 ft. thick, it rises 30 ft. above the level of the plinth, and is built in alternate courses, averaging 3 ft. 6 in. high, of headers and stretchers, the former the whole thickness of the wall and the latter measuring sometimes 29 ft. to 32 ft. long. The foundations are taken from the German drawings, which show that they were carried down to a depth of 25 ft. below the ground. This disposes of the theory put forward some time ago that the temple was built on a mound of earth which the trilithon by its weight kept in its place. The Romans always carried their foundations down to a great depth, and in the case of the plinth they are, according to the Germans, carried down to the rock.

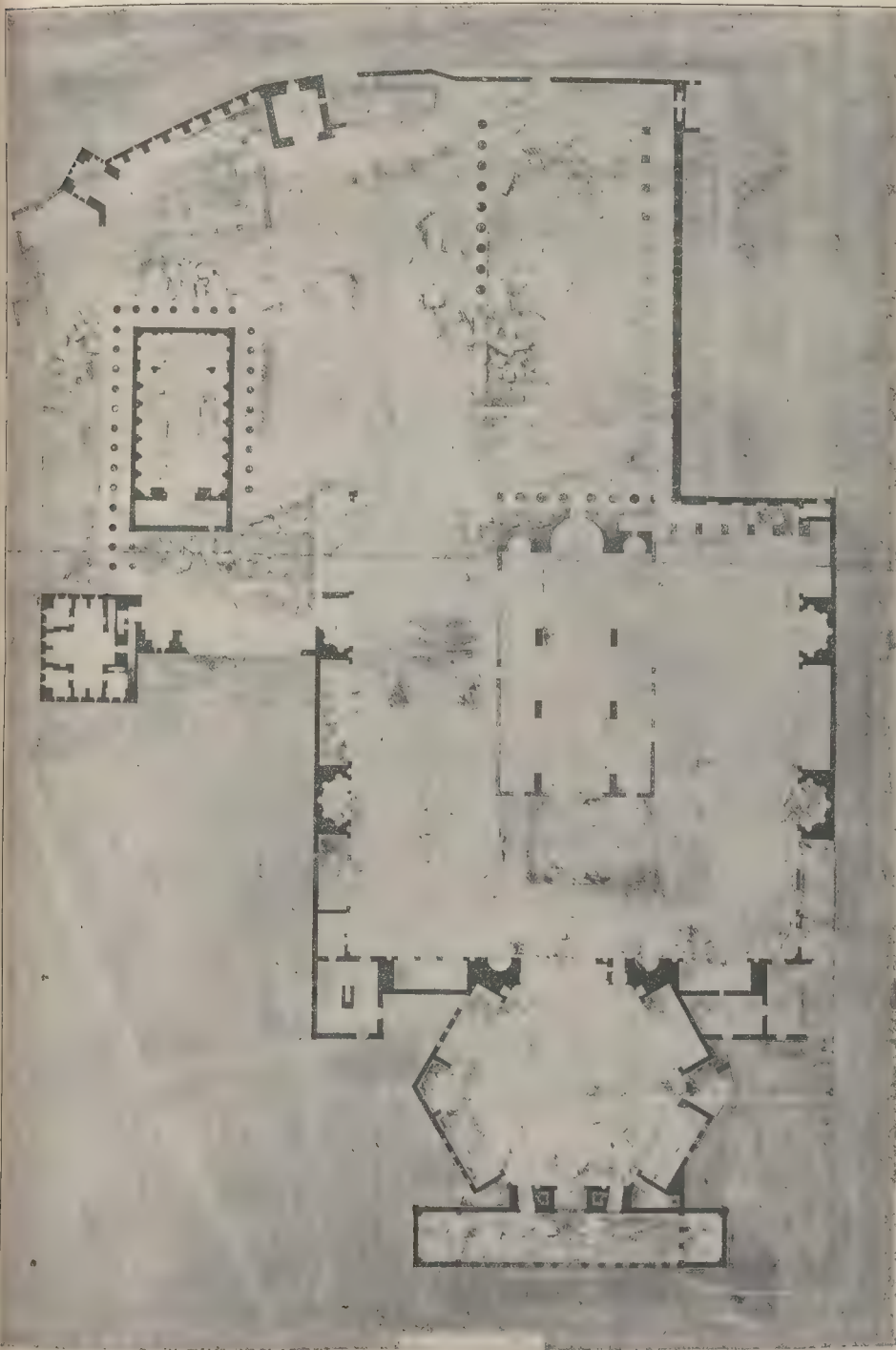


Fig. 1. Basilica: Joya's plan of 1865.

BAALBEK TEMPLE OF JUPITER-SOL

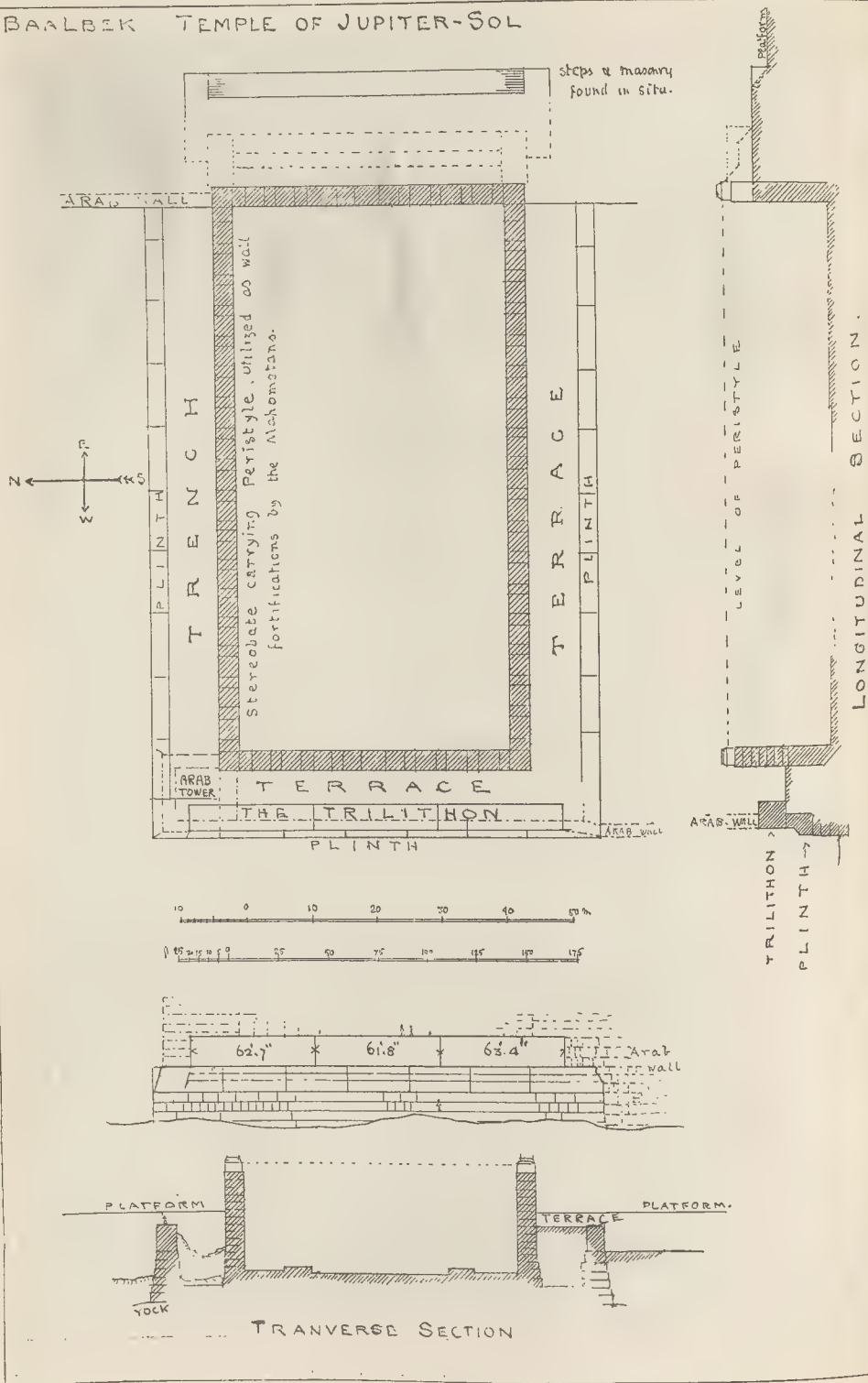


Fig. 2.

Already in 1865 Joyau had noticed that the plinth course terminated on the east side about 18 ft. to the right of the trilitheon, and, sinking a hole on the north side, he found its continuance and marked it on his plan. The Germans, who have excavated over the whole site and removed all the superincumbent earth to some distance from the acropolis, have laid bare this plinth and exposed a paved terrace between it and the stereobate wall on the south and west sides (see transverse section.) On the north side the plinth has always been visible throughout its whole length, but between it and the stereobate wall is now a trench (shown in section). The traces of a similar terrace, however, on this side were found embedded by the Germans in the fortification wall built on the west side of this platform, and it is stated that in former times the space below this terrace was used as a prison to which access was obtained through a door, which still exists in the lower portion of the north-west tower which, as well as this west wall, was built to command this terrace and protect it.

Now, it will be observed that the trilitheon lies in the axis of the great temple, and the theory put forward, and generally accepted, is that it formed a portion of the die of an immense podium, a platform, on which the temple was to be reared. The first problem, therefore, we have to consider is whether this stupendous enterprise was carried further than what actually remains. It seems quite certain that, if stones of similar magnitude to those of the trilitheon had ever been raised, the Romans are not likely to have taken them away, and the Mahometans would only have been too glad to utilise them for their fortifications, being otherwise quite incapable of moving them. They would probably have liked to get rid of the plinth on the north side, where the stones measure some 30 ft. to 33 ft. long, because a terrace over 20 ft. high from the ground would, in case of attack, form a weak point in their fortifications, and might account for the tower and west wall already referred to, which they erected to protect that side. Secondly, on the west side the plinth projects some 3 ft. (see longitudinal section), with a weathered bevel at 45°. This projection was intended to be the base moulding of the die of the podium,* but on the plinth of the north and west side this work has never been executed, which suggests that it never carried a superstructure similar to that of the trilitheon.† Thirdly, there lies in the quarry an immense stone of dimensions far exceeding those of the trilitheon course, which we assume was quarried at the north-west or south-west angle. This, however, they were apparently unable to move. It would have been easy to cut it in two or three blocks, but this was not done or even attempted, for there are no incisions on the block. According to one theory,

some unforeseen catastrophe must have occurred, such, for instance, as the death of the great emperor who conceived this immense undertaking, and who, not only here, but throughout Syria, erected many important temples. From the date of Antoninus Pius's death in 161 A.D. there seems to have been a temporary cessation of work in Syria. His successor, Marcus Aurelius, is not known to have built there, and the work which was being carried on at Baalbek must have required a stupendous outlay.

There is still a fourth reason to be given for the discontinuance of the great podium, and this is found on a coin of Septimius Severus (193-213 A.D.), the first actual record of the works at Baalbek. There are two coins known of Septimius Severus, one showing on the reverse the geometrical elevation of a decastyle temple, the other an isometrical view taken from the south-east (Fig. 3). As all the later coins contain a

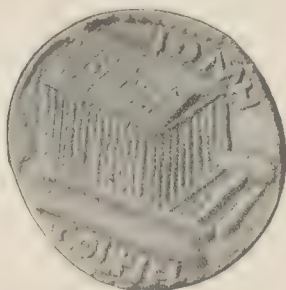


Fig. 3.

similar representation to that shown on this second coin, we may assume that, although the great temple was not terminated till the middle of the IIIrd century, the scheme put forward by Septimius Severus is the one which was carried out; and, as it suggests a modification of Antoninus Pius's scheme, may assist us in solving the problem. In this coin of Septimius Severus an ordinary podium is shown with a flight of steps between spur walls on the east side. In front of it is raised a band not found in the representation of any other temple. This same feature is found in all the later coins, and, as it bears a very strong resemblance to the terrace to which we have already referred as having lately been found by the Germans on the south side of the temple, we venture to think that it solves the problem of the trilitheon. Not being able, or being unwilling, to continue the erection of Antoninus Pius's great podium, the trilitheon was left in its place and the stereobate walls were either encased with an ordinary podium or were left as they now exist. There is another coin which brings evidence to bear on this subject, and to which we shall refer later on, but for the moment it is necessary to turn to other discoveries made by the Germans.

It has always been a moot point as to whether the temple was ever completed, but, as in all the coins it is shown with the roof on, it must have had its cella walls built to carry the same, and, as Theo-

dosius is said* to have transformed it into a Christian church, some kind of internal enclosure must have existed.

The church, of which the walls (shown on Joyau's plan) have been further exposed down to the pavement by the Germans, is of very much later date, being based on a type of plan adopted in the middle of the VIth century, where, probably owing to a change of ritual, an apse was built at the eastern end to take the place of those at the west end, and a central doorway was cut through the central west apse to form the principal entrance. These three apses, however, belong to an earlier church erected on the site, at what period is not known; but, as they were built on the flight of steps leading up to the great temple, we may assume that the walls of the cella were pulled down and the materials used in the erection of the new church walls. At a much later period, and probably when the acropolis was transformed into a fortress, all the masonry forming the substructure of the cella walls was utilised, and the section taken from the German drawings (Fig. 2) shows how completely all internal walls had been taken down.

Now, the three apses built on the flight of steps of the great temple have preserved, at all events, the lowest flight, and these have been traced by the Germans. Unfortunately, however, the discoveries made have introduced another dilemma. The blocks of masonry which enclosed the lower flight extend some 15 ft. on each side beyond the column of the peristyle. We say blocks of masonry instead of podium wall because there is no plinth to them, though the Germans in their conjectural restoration have calmly introduced one, cutting into the steps, which in their *etat actuel* they show abutting direct on the masonry block. If they found the steps, the plinth, if it existed, should have been shown on the latter. This introduces a new problem—if these blocks are the front of the podium wall, it must have been carried back, and the traces of its foundation would appear on the terrace; but there is no indication of the same, and, further, if in the west fortification wall built by the Mahometans they found the traces of the terrace, those of this 16-ft. podium would be discernible; but it is not, the Mahometan masonry is carried straight through to the stereobate wall, which also suggests that the latter was left in its pristine condition without even a podium-facing of the ordinary Roman type. Although the Germans have not given as yet any description of the possible conjectural restoration of the podium, they have suggested conclusions by dotted lines in their drawings. In the first series published they indicated on a geometrical drawing of the east front of the temple a podium of the dimensions conceived by Antoninus, showing plinth, die, and cornice, and they made the top of the latter correspond with that of the great court; but, unfortunately, the trilitheon rises some 9 ft. above that level, so that, with a cornice 3 ft. high, this podium

* The Paschal chronicle referred to in Dawkins & Wood, page 12, states that, whilst Constantine only closed the temples and shrines of the Greeks, Theodosius destroyed some, but the Temple of Baal at Heliopolis, the great and famous trilitheon, he actually made into a church of the Christians.

would rise 12 ft. above the court. To meet this contingency, they lowered the plinth in their dotted lines, which is not a serious way of dealing with the difficulty. In the second series published they have rectified this by indicating the original intended podium standing on the plinth, the section of which they show as worked with the bevel moulding, which is not the case. On the plan published in the first series they carry back the 15-ft. podium to which we have already referred, there being no evidence whatever of its trace or the pavement of the terrace.

It is very difficult to account for the unusual width of the lower flight of steps (the only part found) leading up to the temple unless we assume that it was a part of Antoninus Pius's work intended for the great podium, and that the upper flights were restricted to the ordinary width, which we have indicated by dotted lines on our own plan. Further researches may perhaps find another solution, and, if not in this temple, in that of the smaller temple, where the Germans have found, embedded in the square Mahometan building on its west side, an additional flight of steps below the level of its podium plinth, so that there must have been a special treatment here of the spurs enclosing this flight.

We now come to the last piece of evidence in favour of the terrace theory, which is shown on the reverse of a coin of Philip the Elder (244-249) (Fig. 4). This



Fig. 4.

represents an isometrical view of the great temple taken from the north-east, with a vase and a circular altar in front of it, and, on the left-hand side, an immense flight of steps descending to a lower level. The artist here would seem to have wished to convey the impression that not only was the temple raised on a podium, but that it was, in addition, placed on a high level, and to do this he has omitted the two courts, and shown only the flight of steps leading up to the propylæa.

Donaldson, in his "Architectura Numismatica," conceived the idea that this was intended as a representation of the smaller temple, and in the plan he has drawn of the whole acropolis he has indicated a flight of steps to the small temple on the west side, which, if he had consulted Dawkins & Wood, he would have seen did not exist. He also shows an imaginary flight of steps on the south-west side in support of his theory; but the smaller temple is built at a lower

level than that of the great temple, and on the natural level of the ground, which rises somewhat towards the south, so that if even there had been any steps there they would have been of descent and not ascent, and would in no way correspond to the representation on the coin. There is no doubt, therefore, that Wood was right in his ascription of the coin to the great temple, although the number of columns shown is less than actually existed. That which it is important to note here, however, is the existence of a similar band in front of the podium, which we have already pointed out in the coin of Septimius Severus, and this, we contend, is a representation of the north terrace. There are, however, two other features in this coin—first, a broad band in the foreground, and, second, a smaller wall running at an angle on the extreme right. The first would seem, from its importance and size, to represent the foundation walls of the buildings enclosing the great court, and which, if carried to their proper height, would have hidden the temple and its podium. The wall on the extreme right might be taken as a conventional representation of the plinth carrying the triliton.

In our quotation from the Paschal chronicle it will be noted that special reference is made to the triliton, which shows that in ancient times it was considered to be the chief feature of the temple; in fact, as Wood writes in his preface, "all travellers have taken notice of those stones, some, indeed, of scarcely anything else; nor is it surprising that after the decline of taste, when more attention was paid to mere magnitude than beauty, this temple should be chiefly noted for the largest stones which perhaps were ever employed in any building." It is a fair surmise, therefore, that the artist in Rome, who had never been to Baalbek, and only took his instructions from a general description of the ruins, may have desired to convey by the right-hand wall the important feature for which the temple was celebrated.

NOTES.

The Institute Gold Medal. The award of the gold medal this year to Sir Aston Webb will meet with universal approval; indeed it may be said that, the turn having come round this year for its offer to an English architect, no other choice could well have been entertained; and there will no doubt be a full and enthusiastic meeting to do honour to the presentation of the medal.

The Port of London. NONE of the proposals before the public at the present time appear to meet with the approval of the dock companies. With regard to the Thames barrage scheme, the important question is raised whether the intended locks would be adequate for dealing with the present trade of the port quite apart from any increase. This matter obviously requires serious consideration, but it must not be forgotten that, as all the dock gates will stand continuously open, inward and outward traffic at Gravesend will be spread over all hours of the day, and not concentrated at times of high tide as under

present conditions. The County Council Bill, contemplating less favourable terms to the companies than the withdrawn Government measure, naturally meets with strong opposition, in which we fancy ratepayers will be most ready to join. The Thames Conservancy Bill is, of course, out of the question, being utterly inadequate as a solution of the main problem. Not only the dock companies but the public generally have a right to complain of the delay in dealing with the Port of London, for the proper control of which nothing but an independent authority on which all interests are equitably recognised can be accepted. Given such a body, with ample discretionary powers, it should be comparatively easy to arrive at a decision upon the engineering and administrative questions awaiting settlement.

The Liverpool Aqueduct Failure. ONE notable point in connexion with the recent fracture of the aqueduct

between Vyrnwy and Liverpool was the satisfactory performance of the automatic stop valve—above the point of damage—which speedily cut off the supply of water and so limited the extent of what might have been a most disastrous flood. For a valve of the kind, especially when fixed in a main of large size, a certain interval of time is absolutely necessary before the flow of water can be arrested with safety. The apparatus includes a main throttle valve closed by means of a heavy weight, and the rate at which this operation takes place is governed by a cataract action. In a large main the time occupied is not less than fifteen minutes, the latter part of the movement being performed at a progressively decreasing rate, with the object of preventing shock, and consequent further damage. It may be added that the valve is automatically set in operation by the release of a trigger, this being effected, through a system of mechanical movements, from a disc suspended inside the water main. Although a large volume of water escaped from the Vyrnwy aqueduct last week, the efficiency and value of the automatic valve was very strikingly demonstrated.

American Railway Accidents. IN spite of all that has been said about the superiority of railway methods in the

United States, there is not much for us to learn. We certainly are behindhand in respect of electric traction, and to some extent in the adoption of improved goods waggons. Very little more can be said to our discredit, and so far as concerns general management our lines are much ahead of any on the other side of the Atlantic. We referred last week to the abnormally heavy list of accidents taking place every year on American railways during shunting operations, and recent returns make clear the fact that the same lines still keep up their unenviable distinction in the way of accidents to passenger trains. During the year ending June 30 last no fewer than 3,787 passengers were killed and 51,343 injured. This deplorable record is mainly due to improperly constructed roads, imperfect equipment, the prevalence of single tracks, and avoidance of the block system. It is also due to

general carelessness and a spirit of recklessness that would never be tolerated in this country. If American railway officials would return the visits paid by many of our own engineers and managers, they might learn a good deal that would be useful to them and of real advantage to their fellow countrymen.

WHEN our "Note" of December 3 last was published there appeared to be some slight hope that the further spoliation of the Avon gorge might be prevented. Since that date a special committee of the Bristol City Council have received the report of Mr. Hawkshaw upon the proposals relative to behind-bank quarrying. This document recommends the opening of fresh quarries behind the top of the wooded slopes, by means of a narrow cutting commencing at the face of the present workings. Negotiations were opened with the owner of the land, and it really seemed as if the corporation intended to turn from their evil ways. Unhappily, now comes the ominous news that the Board of Trade, with the concurrence of the city authorities, have consented to renew the leases of the jetties by which alone the quarried stone can reach the Avon. If, as it is stated, this course has been taken without the imposition of restrictive conditions, the final ruin of the beautiful wooded bank cannot be long deferred. Even while professing the desire to prevent further disfigurement, the Bristol Corporation continue to increase the quantities of stone removed from the city quarries, and at the present rate the output cannot be much less than 50,000 tons a year—practically double the tonnage of two years ago. It is perfectly heart-breaking to think of such a beautiful scene being wantonly ruined in this way.

At the Leicester Gallery is an exhibition of drawings in colour and line of "Hunting and other subjects" by Mr. G. D. Armour. A good many of these have appeared in *Punch*, others we believe in other publications. They are the class of art in regard to which one looks as much at the title and the quotation in the catalogue, to see what the special point of the incident is, as at the drawing for its own sake; but they are very clever work of the kind. Among the colour drawings "Getting a Lead" (16) is admirable both in the head of the lady's horse in the foreground and in the foreshortened group of the man and horse struggling through the hedge; and "Down the Hill" (92) is another capital piece of drawing. One of the best and most humorous of the line drawings is that of the Irish fish hawker losing his fish but satisfied in "Keeping up with the Gentry" (22). One drawing (perhaps the only one) which is charming from the purely artistic point of view is the pretty sketch of a girl on horseback, "By the Sea" (38). The exhibition is naturally very popular, but it is hardly the kind of thing one goes to an art-gallery for.

THE Fine Art Society have collected at their gallery a number of old engravings of the Thames "from its source to the sea."

We have never had the pleasure of seeing the "source" of the Thames (has anyone?), and the evidence of it furnished by the old engravings is conflicting and calculated to encourage a spirit of scepticism. But the collection as a whole is very interesting, both in showing some parts of the lower Thames under aspects which exist no longer, and some old bridges (old Windsor bridge for instance) which have been rebuilt; and also in the coloured reproductions of some of the sober and reposeful old water-colour views by Havell, Farington, and others. The main interest of the exhibition, however, is historical and topographical rather than artistic.

On Monday Mr. M. H. Spielmann gave at the London Institution an excellent lecture on the Wallace Collection, tracing briefly the history of the getting together of the collection, which represents to some extent the taste and discernment of two or three successive Marquises of Hertford, though it was the late Marquis, "Lord Hertford of Bagatelle," as he used to be called, who did the most for it by his keen artistic perception and his ungrudging expenditure when works of undoubted excellence came in his way. Incidentally Mr. Spielmann said that it was Lord Hertford who brought Franz Hals into vogue among modern collectors, securing one of Hals's works at Christie's by a first bid of 2,000*l.*, which no one disputed with him, but which had the effect of altering from that time the auction prices for Hals's works, which had previously ranged from about 70*l.* to 80*l.* The numerous lantern illustrations of pictures no doubt formed to most of the audience the main attraction of the lecture, but they were accompanied by some excellent points in art-criticism, which it is to be hoped were not without their effect.

OUR note on this subject has brought us two or three communications from other architects, enclosing letters all from the same person, who seems to have endeavoured to set up a regular business of doing other people's competition drawings for them. Apparently his policy is to tell his correspondents in each case that he has given special attention to the particular kind of building named in the competition, so as to be an expert in it; and in each letter there follows the usual statement that designs made by him have been placed first by assessors, etc. Any architects who are sufficiently foolish, or sufficiently deficient in self-respect, to listen to such proposals, may as well bear in mind that a man who would undertake that kind of jobbery would be as likely as not to "give away" his employers afterwards.

SELL'S TELEGRAPHIC ADDRESSES.—We have received from Mr. Henry Sell, 166, Fleet-street, E.C., the 20th annual volume of his Telegraphic Addresses. The Directory is published from official lists supplied by the authority of the Postmaster General, and it is complete to the end of 1904. It contains the names of 80,000 firms of the United Kingdom (those who have telegraphic addresses), and consists of 2,200 pages. In the new edition is a list of our Consuls in foreign countries. We have found the Directory a useful and reliable work.

HOW TO ATTAIN ORIGINAL THOUGHT IN ARCHITECTURE.*

WHEN I was asked to read a paper before your Society I somehow was thinking of the new art movement in this country (which is anything but a Renaissance), and decided to say a few words—words which might, I hope, assist us in the true study of architecture. We have fashions in architecture as well as in all other things—sometimes we admire and study Classic, sometimes Gothic, and so on; but what I think we ought to do is to so educate our taste that we can admire the beautiful in any style—indeed, in anything. This knowledge will gently lead us towards our ideal, which must, and ought to be, a national style. The great difficulty is the education of what we term taste. Now, we have each a passion, some kind of spirit within us, which if not broken up in any way will prove a tremendous power to us. Keep this spirit pure, concentrate it to your complete study; that is, though you have many studies, let them all lead to the highest, which is design.

A drop of water falls into a stream and is carried resistlessly away to the ocean, or it may be caught into some reservoir, and from there be forced into a fountain; but even here it cannot play any other part, it is but a drop of water. We can learn from this drop of water that we are but what we are, exactly the same; the same as the Egyptians, Greeks, etc., were thousands of years ago—worrying ourselves about love and arguing about religion and all other subjects. The difference is only the difference which exists between one blade of grass and another. Although we are so limited that we cannot fly or turn ourselves into a tree, there is at least one thing we can do, and that is, work harder than what we do—learn to work as hard as three or four average contemporary men.

There are two ways in which to educate our taste—first, by the study of nature; secondly, by the study of all the works of man (which is really nature). Both ways are equally important, as I hope to show.

While travelling in Greece I was struck by the similarity between the Greek mouldings and the contour of the hills and mountains. The Greeks were a healthy people, physically and mentally, so that, endowed with such rare gifts, they attained a high standard of excellence in the representation of nature in their works. They saw more clearly and truthfully than others what they did see. I would like to impress this thought on all who study architecture.

Impressions made upon the mind are undoubtedly influenced very materially by the condition of the body, and the one constantly reacts upon the other. It is proverbial that nature takes the tone and tinge of our mind; that the sun has no brightness and the flower no beauty for the unhappy; while if the heart is light, hope bright, and our prospects brilliant, the deepest gloom of winter's night cannot sadden us. Now I want to take you to a pleasant country glade, through which runs a little streamlet. You all know what a botanist, a photographer, etc., would say; if not, it little matters, as what interests us more is what an architect ought to see or say. Should he not see the whole at a single glance; the masses and groups of trees, the sky and clouds, the boulders and water; see the beauty and know each tree; see the difference of every leaf; watch the effect of light and shade; know the names and see the beauty of every flower, grass, and fern; but, above all, to recognise the decorative value of each, which means to know their construction; see the course of the water; the water, the reflections of the trees, the sky, etc.; see also the transparency and the bed of the stream; know the history, the birds, insects, atmosphere, etc.—if this common country glade be so beautiful and so full of interest, how much more beautiful and interesting must highest nature be, as we see it in man? We ought all, I think, to know the human figure well; even know the bones and muscles; certainly know the contours and proportion. Nothing can train and cultivate our taste so much or so well as the study of the human figure. The study of flowers comes next; and I would suggest that in all our studies of nature we should seek after the decorative qualities rather than minute detail.

To see the beauty in a land or sea scape we have noticed the necessity of infinite variety of

* A paper read before the Liverpool Architectural Society, on February 6th, by Mr. J. B. Fulton.

study; so in architecture—we must know construction thoroughly well, all materials and trades, the clients, etc., combined with a knowledge of painting and sculpture. But what are all these unless we have good taste? We see over and over again fellows working like slaves to build well, but without success. What is the reason of failure? Is the failure not the result of the mistake we all more or less make—the forgetting to educate our taste? We can only cultivate our taste by and through a tremendous struggle, because it is our character, and we know what this requires; to get higher than all creeds in religion and meet God face to face; away with all superstition; not copying hereditary thought, but making proper use of it, and so on. The second way that I suggested was the study of all that had ever been created by man, more especially the greater and more excellent buildings. You will have heard it said that it is not what we eat that strengthens us, it is what we digest; it is not what we read, it is what we remember, and so on. I beg to differ from this. If we have read a book, it is utterly impossible to forget all about it, under ordinary circumstances; after the matter having passed through the cells of our brains, it is bound to influence us some way or other. It is evident that much study is required to stimulate our imagination, because you might worry for weeks over what you consider to be a brilliant and original conception, and years afterwards discover that the same idea had been worked out centuries before. If you had known the previous one, of course, your ideas would have been much superior. I wish to show you some of the buildings that I was privileged to study while on the Soano Tour.

Egypt.

The country of perpetual sunshine and golden sunsets. I visited the cities of ancient Egypt, and there studied the great temples. The vastness of scale is tremendous, their very size giving a magnificence which few buildings have ever reached in any age. The influence of nature is very marked, even the columns being designed from the lotus. The Egyptians, I think, are one of the most conventional people who have ever existed on this earth; their conventionalism charmed me, as it is so suggestive to higher thought. Through it all there is a certain crudeness; but the decorative quality is so very excellent. We visited the Tombs of the Kings in Thebes. The Tomb of Sethos I. is most interesting, executed during the finest period of Egyptian art. Several rooms are unfinished, and there we saw the different stages of the decoration. I was particularly struck by the splendid drawing of the design which guided the sculptor. The sculpture is in most delicate relief, vying in beauty with some of the earlier Italian masters in the Renaissance period. Their drawings of animals, plant-forms, birds, etc., show great skill in design. The statues were sculptured in the same spirit of conventional design. The position of statues between the columns in a colonnade is worthy of note, as the light and shade is very effective.

Greece.

A mountainous and lovely country; the architecture vying in beauty with highest nature. I use the word "architecture" instead of "art," because in Greek architecture the arts met in perfect harmony. I well remember the tremendous excitement which filled my whole being as I climbed the Acropolis Hill in Athens, and when the Parthenon stood a reality before my eyes. I confess that I was disappointed, although as a ruin it is really magnificent. In design, dignity is its saving grace. I pictured in my imagination its grandeur when robed in all its glory; but could not get very enthusiastic over it. The north portico of the Erechtheum is a perfect work in architecture. While I was there a huge scaffold was erected round, as the Government was restoring it. I readily got permission and measured it. The capitals show great skill in design, and must rank amongst the finest works of art in the world. The sculpture, as you all know, is exceptionally fine; for instance, the frieze of the Parthenon, the figure of Victory at Olympia, the panel with Victory trying on her sandal, etc. I visited the recent excavations by the French Government at Delphi, and there got an idea of how imaginative the Greek sculptors were.

Roman.

We come to the treasury in architecture,

and in Roman splendour see all previous buildings surpassed—at least, in magnificence, in architectural form, and conceptions. The interior of the Parthenon, I have little doubt, was very impressive, but nothing to compare to many of the Roman baths, etc. The Greeks were very conservative in their ideas, always building in perpendicular and horizontal lines. I have no doubt that to a great extent this was ignorance; they little dreamed what effects were possible by arches and domes. Roman architecture directly influenced the Renaissance, and there is no other style so greatly studied to-day throughout the world as the Roman. St. Peter's, in Rome, seems a fitting Renaissance monument to this great age. If someone would come forward and reveal the beauties in Roman architecture, as already has been done with Greek, a great impetus would be given to architectural design.

Byzantine.

Byzantine architecture is late Roman building, but with a truer spirit of beauty which Christianity could and can only give. I think that this is the style which we ought to study more, as it is so adaptable to our modern requirements. The construction is always so excellent, and refinement is shown down to the minutest detail. I had the pleasure of measuring many of the buildings in this period. The Palace of Belisarius, Constantinople, is a magnificent example of a domestic building, as you see from my measured drawing.

The Church Mosque of S. Sophia, Constantinople, was a revelation to me in every way. The construction is masterly, and the proportion of the interior is almost perfect, so that everything is in correct detail. This building ought to be the Mecca for architects.

Saracenic.

Although one may know the Saracenic buildings in Spain, etc., it is generally acknowledged that Cairo must be visited before we can have any definite idea of building in this style. The mosques and tombs are a revelation, and it would be an interesting study to trace their influence in more Western lands.

The average type of building grows from a square base, by pendentives is taken to the octagonal form, on which rests a dome. I measured and sketched several, as you will see from my drawings.

Turkish.

It seems natural to go direct from Saracenic to Turkish, as both are products of Mohammedan power. The latter, however, was more strongly influenced by Christian buildings, as I will show.

While in Constantinople we were fortunate in getting an *errada*, or permit, to sketch and measure the mosques. We spent three months studying the mosques; many of which are Byzantine churches. All the large mosques are built on the lines of S. Sophia; it was, and is seemingly, impossible for the Turks to design a mosque on any other principal.

I have but touched on some of the more cultured periods in architectural history, but sufficient, I hope, to show the absolute necessity of the study of all styles. Now, if we have a knowledge of the finest buildings, surely it is but reasonable to suppose that this knowledge, combined with our own individuality, will carry our thoughts higher and attain a greater height of excellence than if we forced ourselves to conceive the original ideas in the pride of our own natures.

We see the use and influence of nature in art. I sometimes wonder what effect tropical plant-forms would have in our modern design. I think that a tremendous impetus might be given to design from this source, as there must be thousands of forms that we have never even dreamed of.

WAR MEMORIAL, FARNHAM, SURREY.—The memorial to the soldiers of the parish of Farnham who fell in the South African war was recently unveiled in the parish church by Lieut. General Sir John French, K.C.B. The memorial is placed in the north transept, on the east wall. It is of Italian statuary marble and Brazilian onyx. The design consists of two fluted pilasters with moulded bases and carved capitals supporting a semi-circular moulded arch in the centre of which appear the arms of Farnham, in Venetian glass mosaic of blue and gold. The tablet itself is of marble, with a margin of Brazilian onyx. The work was executed by the Art Pavements & Decorations, Ltd., in accordance with designs by Mr. A. H. Guyer, architect, Farnham.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AN ordinary general meeting of the Royal Institute of British Architects was held on Monday in the Meeting-room, No. 9, Conduit-street, Regent-street, W., Mr. John Belcher, A.R.A., President, in the chair.

Deceased Members.

The minutes having been taken as read Mr. Alexander Graham, Hon. Sec., said he regretted to announce the decease of Mr. G. Hurst Stanger, of Wolverhampton, Fellow, elected in 1892, and of Mr. Walter Aston, Manchester, Fellow, elected in 1901.

Requests to the Institute.

Mr. Graham said he had the satisfaction of announcing that the late Mr. J. T. Wimpeys had bequeathed 1,000*l.* to the Institute, to be applicable at the entire discretion of the Institute, for the encouragement, promotion, and study of the knowledge of architecture or other purposes. Mr. Graham also announced that Mr. J. Macvicar Anderson had given twenty-four Architectural Union Company's shares and Sir Aston Webb nineteen for the purpose of promoting architectural education.

The Royal Gold Medalist.

The Chairman said it was his pleasing duty to announce that Sir Aston Webb had been nominated by the Council for the Royal Gold Medal this year.

The announcement was received with much applause, and the Chairman added, "This evidently meets with general approval, and his name will be at once submitted to the King."

President's Address to Students.

The President then delivered the following presidential address to students:—

Fellow-students of the art of architecture—I address you all as fellow-students, for with us, as I daresay you know, it is "once a student, always a student." Our service is not for a term of years; the brief period of formal apprenticeship is followed by another very similar in its abiding purpose to what the Germans of the old-time guilds used to call a youth's Wanderjahre—with this difference, that our period of Wanderjahre, our earnest search after the best, only terminates with life itself. We must always take a watchful interest in all that pertains to our art, and be ready, all of us, old and young alike, to assimilate every real advance, every true development.

To you who are now serving your term of formal apprenticeship I say, "Make the most of your opportunities, for they will pass all too quickly." The time thus dedicated to the acquisition of knowledge and the attainment of proficiency, to the training of your powers of observation and imagination, will prove all too short for the end you have in view. The mistress we serve is a jealous one; and if we would work her successfully, we must be prepared to make sacrifices and to forego many indulgences. The ordinary amusements and pleasures of youth will often have to give way to the claims of your art, to the duty of sketching or measuring, or to the study of constructive art; in short, you must be ready to avail yourselves of any and every opportunity that may present itself for enlarging your experience and knowledge. Above all, take your art seriously, for it is only to the earnest student, we may almost say to the devotee, that the veil is lifted that shrouds the mysteries of our art.

It is with the greatest interest that year by year we examine the results of your efforts, and with the best of good wishes that we assign rewards and prizes. There are many who have not won prizes who yet have accomplished very good work—work which will stand them in good stead in after-life. To all I would say, "Do not rest upon your laurels; preen your wings for higher flights." The knowledge and discernment you have already acquired are as nothing to the more subtle secrets, the more hidden beauties, that await your earnest search.

I do not now propose, nor is this the occasion to discuss, the course of study necessary for the initial equipment of the architect; that is a matter which is being carefully thrashed out by the Board of Education. Nor will I venture to criticise in detail the admirable drawings submitted: this will be done leniently and sympathetically, I have no doubt, by Mr. A. J. Prentice.

But I do want to take this opportunity to emphasise the importance of a more systematic study of those buildings which are universally

recognised as good. "Quod semper, quod ubique, quod ab omnibus" is a dictum which we may very well borrow from the theological schools and, having borrowed, stick to. Moreover, I should like to suggest certain methods to be adopted in the study of such examples.

The student's first impulse perhaps is simply to annex the whole subject as "stock" or "copy." Now certainly it is a very right and proper thing to do so, but we must not let our thoughts lie idle; we should endeavour to discover why the subject is beautiful or admirable, what are the elements in it which have contributed to that result. At first, it may be, such an effort seems to go unrewarded; but if the habit be persisted in, intelligent perception will awaken, little by little the light will grow, and soon it will be quite easy to disentangle from the mass, as it were, those characteristics, those laws, those conditions, which have made the building what it is.

While traversing some particular line, for instance, note its relative proportions to the other parts. Follow out, if you can, the methods of construction, and mark how the effects are produced. Examine the general masses from various points of view and study the composition of your subject, not only in respect of its component parts, but also in relation to its environment. The latter is of great importance, for one of the chief elements of success in a building is its adaptation to its surroundings. Here it is especially that "scale" comes in, for the scale of a building must be either in keeping with or in contrast to adjoining buildings or objects, just as colours must either match exactly or be complementary to one another. Scale is relative and determines the proportion of one part to another and of the several parts to the whole. It is like the dominant note or key in a musical composition.

You are probably all of you aware that sounds which harmonise and please the ear have fixed relations to one another. For instance, if you strike an object of a metallic or otherwise resonant nature, a trained ear can distinguish three notes in conjunction, viz., the fundamental or keynote, and the third and the fifth in the division of the octave. These "harmonics," as they are called, will be most clearly recognised in listening to the sound of a large bell. Colour also has its divisions and harmonies, and you will not get far in architecture without discovering that here also similar laws hold good, and that there is such a principle as a true proportion of parts in the scale of building. It is only by a diligent study of and a careful regard for these laws that we can effect a harmonious composition, which all the same can never be merely mechanical in architecture, any more than it can in music. There is as wide a range of possible combinations and developments in the one case as in the other. The great architects of every age and every country have exhibited as wonderful a variety of progressions and characteristics as can be found in the works of Mozart, Beethoven, Mendelssohn, or Wagner.

You should also have regard to the aspect of the building you are studying—whether it is situated in the narrow street, the broad thoroughfare, or in open ground. Note how the projections and lights and shadows are determined on each frontage. Where the sun penetrates reflected light may be taken advantage of. Projections and shadows on a south front are by no means the same as they would be with a north aspect. How well Vanbrugh, amongst others, understood this! I mention Vanbrugh because his insistence on this point is so obvious.

It is only thus by analysing and searching out the guiding principles which have actuated men in the past that we shall really profit by a study of their work. If we can discover the sequence of thought which has guided them in the achievement of fine results, we in our turn may, by taking thought, successfully work out the problems which come before us. Depend upon it, that which we admire in their work is not the result of careless, accidental, or haphazard arrangement of materials. No, there is thought behind it all—sometimes naïf and immature, and sometimes even "smelling of the oil"; but there it is, and the best results are just those upon which the best thought has been expended. If genius is not, as it has been defined, "an infinite capacity for taking pains," at any rate in architecture, it is very nearly akin to an infinite capacity for taking thought. The best thought, however, does not advertise itself, and the best work is not neces-

sarily that which first arrests our attention. How often has it been our experience in the past, when going to a place a second or a third time, to come across some excellent building which altogether escaped our notice on a previous visit. Rely upon it, such a building will repay careful examination.

Do not be misled by the apparent simplicity of much of the best work, for this very simplicity, if not the outcome of profound thought, is the triumph of a practised genius. "Through the complex to the simple" is almost a law of mental evolution. Do not, therefore, fall into the error of a certain member of a building committee who remarked to the assessor in a competition, "I cannot understand why you have put So-and-So's design first. It is so simple—anybody could draw up a plan like that." When it was pointed out to him how difficult the other competitors had found their task, and how complex and incoherent some of their designs were, it began to dawn upon him that perhaps there was more in Mr. So-and-So's design than met the eye of a casual member of a building committee.

When you are making a study of a subject it is upon the work as a whole that you should concentrate your critical acumen. Do not allow your attention to be diverted by attractive or suggestive bits, and do not wander off into the by-paths of archaeology. When you study mouldings, for instance, or similar features of a building, do not regard it as an opportunity for speculating what date, style, or period it belongs to, but regard it from the point of view of its true purpose and meaning. In the case of the mouldings, consider not merely their beauty of form, but their effectiveness in affording shadow and protection. Archaeology has its place, but it should be kept there. It often usurps the interest and attention which ought to be given to the example as architecture. The glamour of historical romance has served to invest many a building with a purely factitious value. The accidental effects of age and decay appealing to the sentiment of the man pervert the judgment of the artist, to his own detriment and that of his art. This same sentimental halo, hanging around all that is ancient, is responsible for the many imitations, forgeries, and affectations which have so long dogged the footsteps and hindered the progress of genuine architecture, and which in some cases have proceeded to such an extreme of absurdity as to tempt man to forswear the past altogether and to rely upon their own creative faculty to invent something altogether new.

This is the other extreme of folly—for folly it is to think that our inherited traditions can be safely ignored, or that buildings which have stood the test of time and criticism have nothing to teach us. They are, on the contrary, as massed wealth in which digging deep, we shall unearth many a hidden treasure. They put before us problems—and their successful solution. They portray many various methods and effective combinations, suitable forms adapted to different materials, varied textures serving a definite purpose, and other elements of beauty and strength which, if not always entirely realised, are yet present as an ideal which we may all study with advantage and strive to express in our own work.

So I say to you, my youthful fellow-students, steer an even keel, if you can, between the Scylla of a superstitious and sentimental regard for the past and the Charybdis of a contemptuous indifference to all its works. If an example is merely old, leave it alone; if it is artistically good, approach it with all reverence, and examining its structure within and without endeavour to discover the secret of its charm, even as a bee extracts the honey from the flower. Do not make the mistake of supposing that you will necessarily be able to define the exact nature of the secret.

There are principles of architecture as absolutely reliable and yet as vague and ill-defined, as much "in the air" if you will allow the expression, as the laws which govern musical progressions or the methods which underlie true literary form. In no one of these cases can the subtle secrets of the art be distilled in the form of express and mechanical rules. If we desire that our own powers may be moulded and guided on true lines, we must, as it were, live in the storehouses, continually absorbing the spirit of the masters as embodied and expressed in their works. Centuries of experiment and criticism, generation after generation of trained perceptions and cultured intelligence, have

gone to determine what is good, what is beautiful, what is true. Shall we throw away the results of all this? Rather let us recognise and admit that our knowledge should be based upon the experience of those who have gone before, and our taste trained and refined in the study of the cultured monuments of the past. As Professor Clausen has said in reference to paintings, "The work of our own times may lose its freshness and interest in a few years, while the older works still hold us with an increasing charm."

There are many ancient buildings in our own and every land which hold us with an ever-increasing charm—a charm attributable to their simplicity and self-restraint, their sincerity and directness of purpose, the straightforward and appropriate way in which they declare their object and intention. Every such building will be found to possess a vitality of its own which, so far from ignoring traditional methods, has taken them up and carried them on a stage further. So now the proportions and values which have determined good effects in the past must hold good to-day. The needs of the times, it is true, call for special and characteristic expression; we may have to readjust, to combine afresh; but every new departure, if it is to be true and lasting, must take the old as its starting-point, the past as its basis, that which has been already accomplished as its foundation.

In all good work we shall discover a perfect blending of science and art, so combined that it is impossible to say where the one ends and the other begins. Where these are divorced there can be no true architecture. A steel-constructed building, for instance, cased with terra-cotta—or any other material for the matter of that—is not architecture at all. In studying a building this is the first test to be applied; this is the standard to which we must, first submit it for judgment. Do not begin by sketching or noting merely surface decorations or artistic embellishments; rather take the details of construction as your starting-point. Note the size and bedding of the stones and the position of the joints—elements of beauty which are too often overlooked. Examine the methods of support and resistance, not thinking only what is necessary, but also how it satisfies the eye. Discover the scientific and mathematical problems which have been successfully worked out. Yet do not even in thought separate the science and the art of the building—the two are conjoined, and must be studied together and simultaneously.

The building must be solid and strong as well as graceful and pleasing. Stability is demanded no less than beauty. In fact, good construction, including the right use of materials, is a prime essential and the foundation of all excellence in architecture. Nowhere, I think, is this more forcibly demonstrated than in the career and work of Sir Christopher Wren, who, carer and work of Sir Christopher Wren, who, both by education and the bent of his youthful genius, seems rather to have been of the scientific and mathematical than of the artistic order of mind. Though, like all educated men of his day, he took an intelligent and cultured interest in architecture, he received no special training for such work. Wren took his degree at Oxford at the age of eighteen, became a Fellow of All Souls at twenty-five, and three years later was made a D.C.L. of Oxford and an LL.D. of Cambridge. Obviously it was not upon the ladder of architecture that he rose to these distinctions. As a matter of fact he was professor of astronomy at Gresham College, and in mathematics and astronomy he acquired for himself a European reputation. He was also President of the Royal Society in 1680. I have adduced these facts to show that though he undoubtedly possessed a very wide range of general knowledge, and was endowed with natural gifts of a wonderfully high order, all these were in the early part of his career directed to the practical side of life rather than to the artistic. His art was dormant; it was there, however, and he sometimes gave the rein to it a bit, for he is said to have invented mezzotint, or at least some improved method. It is interesting to speculate what it was that finally drew all his wonderful gifts and powers into the service of architecture. Whether the determining impulse came from within or without—probably a bit of each—I cannot doubt that it was the scientific or constructive side of architecture that attracted him in the first instance, and that led him to accept an appointment as Assistant Surveyor-General of His Majesty's Works.

In our own experience we find cases where we are much more impressed by the constructive beauty of a building than by any other feature in it. So there is an order of mind to which power and fitness of purpose appeal with unusual force, just as, again, a mathematical mind finds a fascination in the treatment of solids and voids, and of superincumbent masses.

The first important work entrusted to Wren in his new office will serve to indicate, not only the natural bent of his mind, but also the official appreciation of it on the part of the authorities. He was set to examine and report upon St. Paul's Cathedral, which it was feared was in a dangerous condition. It is evident from the report that he did his work thoroughly—the very first thing he did was to measure the whole building carefully—and the insight and experience that he thus gained in constructive work stood him in good stead afterwards.

With respect to the roof he says: "It is evident by the ruin of the roof that the work was both ill-designed and ill-built from the beginning—ill-designed because the architect gave not abutment enough to counterpoise and resist the weight of the roof from spreading the walls. This also may be safely affirmed not only by an architect taking his measure from the precepts and examples of the ancients [you see he advocated this], but by a geometer (this part being liable to demonstration), that the roof is and ever was too heavy for its abutment; for the eye alone will discover to any man that those pillars, as wide as they are, even 11 ft. diameter, are bent outward at least 6 in. from their first position. . . . The bending of the pillars was facilitated by their ill-building, for they are only cased without, and that with small stones . . . but within nothing but a case of small rubbish stones and much mortar which easily crushes and yields to the weight."

Good old times those! Jerry-building is obviously not a very modern institution. Then, too, Wren's first problem in building was a constructive one, for in the wonderful roof of the Sheldonian Theatre at Oxford, which has a span of 68 ft., the scientific construction is masterly, and brought him great reputation. Two years later, viz., in 1665, occurred the Great Plague, and Wren took the opportunity to pay a visit to France to study architecture as a fine art. In Paris he studied all the principal buildings, and became intimate with the most celebrated artists there. He was introduced to Bernini, who showed him his designs for the Louvre, for which he says in his Notes he would have given his skin. The old Italian would not let him study it long, and he says he only had time to "copy them with a crayon to give a tolerable account of it." He also studied Fontainebleau, St. Germain's, and Versailles. Of the last-named he says: "The mixtures of brick and stone, blue tile, and gold make it like a rich livery—not an inch within but is crowded with ornament." Wren's own work was subsequently distinguished by its colour effects and contrasts of texture. He adds, in the letter from which I have already quoted: "The women as they make here the language and the fashions, and meddle with politics and philosophy, so they sway also in architecture. Works of 'fligraund' and little trinkets are in great vogue; but building ought certainly to have the attributes of eternal, and is therefore the only thing incapable of new fashions."

These words coming from the man who advanced the architecture of the Renaissance to such a pitch of excellence and succeeded in establishing an English tradition fine in type and grand in scale—the importance of these words, I say, as a guiding principle for the student cannot be over-estimated.

I hope I may be pardoned for quoting so freely from Wren, and for enforcing my points by the history of his career; but his methods of study and the line of his development are so clearly before us that I am sure we may draw many useful lessons and suggestive hints from them.

In conclusion I will briefly recapitulate some of these points. That which I have especially endeavoured to impress upon my brother students this evening is, that in addition to the ordinary architectural curriculum there must be a systematic and continuous study of buildings that are worthy, both ancient and modern. We must live in an atmosphere of art, breathe it in at the very pores of our skin, as the phrase goes, that it may act upon our own mental soil and render it productive. This fertilisation will be immensely stimulated if, to continue the

figure, we plough up the ground with hard thought. "Hard thought," this is one of the great secrets of good architecture—hard thought not only in the problems submitted to us for solution, but in our study of examples. Without such thought we shall sink into mere copyists or adapters of a few stock-in-trade types, having no affinity to the thought of the time or the purpose of the building; in other words, our art will cease to live and grow. I have also urged upon you the importance of laying a good foundation in a practical knowledge of the art of construction and the right use of materials.

This is the only solid, reliable basis for our art. Without such knowledge the keenest appreciation of the beautiful may be only thrown away; at the very best it is for ever fretting against the limitations and restrictions with which it finds itself encompassed. But if the practical, scientific foundation is well and truly laid, how great, how delightful, the field that opens up before the artist! His very fetters become his servants; the goal of the taskmaster becomes in his hand a tool for the accomplishment of all, and more than all, that his eye had conceived or his fancy dreamed of. Let our ultimate ideal be the realisation of those moral principles which are the dignity and power of architecture as they are of life—viz., simplicity and self-restraint, sincerity and directness of purpose. Without these we cannot but fail; with these we may accomplish something worthy of our art, and leave behind us work that shall be honourably characteristic of our time.

Criticism of the Students' Drawings.

The Chairman said there was nothing more valuable to the artist than real honest criticism, and he thought the students would appreciate the remarks about to be made by Mr. A. N. Prentice in regard to the works submitted for the prizes and studentships this year.

Mr. Prentice then dealt with the various drawings, and, in the course of his remarks, he said that, generally speaking, the standard of excellence was well maintained, and he was glad to note that the prizes were competed for in increasing numbers; although it was somewhat surprising, considering the large number of architectural students in this country, that such a very small proportion come forward. Take the Owen Jones Prize, for instance: only three gentlemen had responded. He hardly thought students appreciated the vast amount of good these studentships do for them; to many it had been one of the stepping-stones of their lives. In his criticism he proposed to deal first with the drawings and studies of old work; and, secondly, with the designs—the ultimate end and aim of all these studies. He had always considered that a facility to draw well was the first makings of a great architect. Did not Michael Angelo impress on his pupils the importance of continually drawing? He knew good drawing was not deemed of any great importance amongst some architects, but a visit to the gallery of the Alpine Club was sufficient to tell many that the students think otherwise.

In speaking of the drawings for the Silver Medal and 10 guineas, he said he should like to impress on the students that, while he was glad to see so many recognise the importance of measuring old work, the artistic rendering of an important subject should by no means assure them the prize. He would also impress on students the essential importance of a methodical method of measuring up the buildings they had selected. Year after year the Committee (who gave very careful consideration to the original surveys) were horrified, he was told, to see the scrappy, haphazard, and unconvincing methods adopted by many of the competitors; and in awarding the prize the Committee were largely guided by the surveys which indicated the most careful and thorough investigation and study of the buildings. Having dealt with the drawings, Mr. Prentice turned to the second part of the subject, viz., the designs. What could be more delightful, he said, than to be untrammelled by cost in working out one's ideas on paper? The pleasure of indulging in one's extravagances and fancies must be very pleasing. "Do not restrain yourselves if you want to win the prize; put in all you know. An unsuccessful competitor sending in for the first time for the Soane Medallion will probably be impressed at the display of the prize-winner, but it will be an incentive to him to higher ideals next time. Therefore, design in the grand manner, but, as a word of warning and as a matter of the greatest importance, try to make your building

represent what it is intended for. A Roman bath can never be mistaken for a hotel lounge, nor a warehouse for a Royal palace. Symmetry of design should be aimed at to get a dignified effect; avoid equal divisions of floors and string-courses; and, finally, start with the plan before beginning your elevations. The designs this year for the Soane Medallion are of an exceptionally high order. A design for a Royal palace is a very good subject."

Professor Beresford Pite said he had great pleasure in asking them to express their hearty thanks to the President for his address, and to Mr. Prentice for his criticisms. He could scarcely trust himself to speak of Mr. Belcher's address; he was in the happy position of finding in it nothing new to him, but everything that he believed to be absolutely true, and he most cordially and heartily recommended the careful study of it to the student. One knew how easily these addresses, which were somewhat general in their character, were forgotten, but he urged them not to forget the address delivered that night, but to take the opportunity of frequently referring to it if not of storing their minds with it. There were few things more perplexing to students, he took it, than the difficulty of trying to appreciate what to do, what to see, what to sketch when a student found himself in such a place as Florence for the first time, or in Rome, or further afield, as students were now doing. The wise and earnest and carefully thought-out address they had heard that night would to such students be a very valuable guide. Their thanks were also due to Mr. Prentice for so carefully going through the drawings and giving them his interesting notes. He (the speaker) always cherished the conviction—the certain conviction—that there were qualities in the unwarded designs which far excelled the qualities which had appealed to the adjudicators. On that point he could, with long experience, speak with some conviction, and, speaking to those who were not among the honoured that evening, he would say, "Comfort yourselves with that divine hope that the assessors have been blind to some of those special qualities which are strong in your work. Whatever happens, do not be discouraged. There is absolutely nothing to be discouraged about in having made a great effort, and in having obtained the opportunity of such an exhibition as we have had this year. Such labour is not thrown away." He had another conviction, i.e., that all the best designs were made out of office hours—"they smelt of the midnight oil; they have taken the place of the tennis-court, the cricket, and football fields for the time being." He did not think that a student attained to a satisfactory success unless the whole of his mind was put in his work. And a student should not grumble if, owing to a course of study somewhere, he did not have the opportunity of competing for the Institute prizes. "Make up your mind that when your course is up you will go in for them. You will often feel discontented with your design, but, nevertheless, go on with your attempt." He should like to make a suggestion as to the Pugin Studentship and the measured drawings. The conviction had come to some of them that the time had come for a reconsideration of the conditions of the Pugin Studentship. "We see, year after year this vast amount of labour and care expended in the production of sketches, and there the matter ends. The successful student is congratulated for his drawings and he embarks on another two months of the reckless sketching, and comes back. The Institute is no richer, the student, though happier, is not wiser, and again and again the process is repeated." If the Institute would predicate every year the task to be followed by the successful student—would indicate to him some era of English medieval art—and would define its character—domestic, ecclesiastic, castellated or the general architecture of some district, or of some material, and would embody the students' studies in a report, which might be published periodically—in course of time they would obtain a complete collection of drawings and studies. How much more might he not claim that a reconsideration of the conditions for the measured drawings was desirable? Year after year sheaves of valuable measured drawings were brought there and then disappeared. The Institute did not claim them—the limited accommodation had something to do with that—but he thought they might be filed and kept as

requirements. One of the worst features of the Bill was its retrospective action. It proposed to affect existing property, and anyone who knew anything of leases and mortgages, and so on would know that it would prevent building altogether by preventing financial transactions being carried through. Then there was no finality in the Bill, and the County Council proposed to exempt their own buildings from any restrictions at all. He knew that the District Surveyors' Association had had numerous examples come before them where the greatest wrongdoers had been the London County Council. Then, with regard to the Tribunal of Appeal, they said that no architect should be on the Tribunal who was a practising architect. Evidently the County Council wanted someone on the Tribunal who knew nothing about the subject. With regard to some of the proposals in the Bill in respect of street widenings, their application would mean the taking away from owners of sites in the City of enormous value.

Mr. C. W. Matthews (St. Pancras) said there were many in the room who felt that the Bill contained good clauses, and who would give support to it if it were substantially amended.

Mr. Tagg (Town Clerk, Camberwell) remarked that, while there were many clauses in the Bill which the Council would reject, there were others, such as regarded the provisions as to fire and the re-numbering of houses, which they would like to see in force at the earliest opportunity. He thought they might easily arrange with the County Council that some of the clauses should go through unopposed. It was in the outlying positions of London that they felt the need of an Act, for they found many clever architects and builders who knew how to get round the 1894 Act. He wanted powers to deal more especially with these architects, and so prevent overcrowding of houses and danger of loss of life by fire.

Mr. J. W. Lorden (Wandsworth) pointed out that the conference represented the local authorities, and they ought specially to consider the whittling away of what little powers they now had. Another serious matter was the delay which would occur before building operations could be commenced, for the Bill gave the County Council "such reasonable time as is practical" to consider applications.

Mr. Pearsall (Hampstead) thought the passing of the resolution would be futile. The County Council had invited the Borough Councils to send in suggestions, and no doubt they had. They in Hampstead were anxious to have considerable alterations made in the Building Act. He hoped the conference would consider the Bill in detail and make suggestions for its amendment.

Mr. Whurr (Paddington) moved, as an amendment, "That the Bill be either withdrawn or else opposed," and for this 37 voted and 19 against. The amendment was carried as the substantive resolution.

Major Isaacs next moved: "That, inasmuch as the London Building Act of 1894 is already complicated by the amendments of the Act of 1898, this conference is of opinion that a new Building Act for London, superseding the present Act, should be formulated, and that before the Bill is drafted the views of the London County Council, the Corporation of the City of London, the Councils of the City of Westminster and the various professional associations connected with building work should be ascertained and considered."

Mr. W. Emden (Westminster) said that, while he was quite in sympathy with any reasonable requirement being made with regard to fire, he did not think they ought to neglect the larger question. They were all desirous of having a complete end of the matter. The Building Act of 1855 was not altered until 1878, and then more particularly with regard to the protection of theatres from fire, and in the main the 1855 Act stood till 1894. In 1894 the County Council framed a Building Act, and it had not been in operation ten years before they wanted to make drastic alterations in it. He was quite prepared for certain amendments of the present Building Act to be carried, but it was necessary to have something like finality, and that could only be arrived at by having a Royal Commission composed of experts before whom experts could give evidence. To-day, in London, they had to go to one Committee of the County Council to get the plans passed, and to another to deal with exits and entrances, and another with regard to sewage, and so on.

They found contested points between the local authorities and the County Council, and those who wanted to build were made the shuttlecocks between the contending parties. He felt that the only remedy was to get the Building Act properly codified, and he moved that after the words "formulated" the following words be inserted: "After the matter has been considered by a Royal Commission, and also that the Royal Commission should consider the drafting of a Bill which shall codify the whole of the building law in London."

Mr. Whurr (Paddington) seconded the amendment.

Mr. J. Lewis (Marylebone) expressed the hope that whatever was done they would not ask for a Royal Commission.

The amendment was carried by a large majority, and the motion as so amended was agreed to.

Major Isaacs (Kensington) moved: "That in any new measure the London County Council should be relieved as much as possible by transferring to the City and Borough Councils all duties that can be efficiently discharged by those bodies in accordance with the views expressed by the Royal Commission in 1894."

The motion was carried without discussion.

Mr. A. B. Bryceson (Town Clerk, Woolwich) moved: "That, with a view to promoting uniformity of procedure on the part of those Borough Councils opposing the Bill, a committee be appointed to prepare a draft form of petition against the same, which, if thought expedient, may be adopted, and also to watch the proceedings so as to advise the conference as to any further action which may be needed."

This was agreed to, and it was also decided that each Borough Council should be asked to send a representative to form a committee. The following gentlemen were chosen as a sub-committee to draft the petition:—Messrs. Morton (City), Prescott (Fulham), Bradley (City Engineer, Westminster), Bryceson (Woolwich), and the Mayor of Kensington.

It was also resolved that copies of the resolution be forwarded to the Prime Minister, the First Lord of the Treasury, and the President of the Local Government Board.

SCHOOL HYGIENE.

A CONFERENCE on school hygiene, organised by the Royal Sanitary Institute, was opened on Tuesday at the London University, South Kensington. In connexion with the conference there is an exhibition of school building and sanitary appliances in the great hall of the University, and here a reception of delegates and members took place. They numbered about 600.

The Duke of Northumberland, as President of the Royal Sanitary Institute, took the chair in order to instal Sir Arthur W. Rücker, Principal of the University of London, as President of the conference, and to call upon him to deliver his presidential address. After explaining the purpose of the conference and acknowledging the services of the Royal Sanitary Institute to the public health, the Duke said they were particularly fortunate in securing as their president the Principal of the University of London. It was through our universities and colleges, and especially their training colleges, that they must look for the advancement of hygiene, and when the Principal of the University of London took the lead they might look with confidence to others following at a respectful but, he trusted, not very distant interval.

Sir A. Rücker then took the chair and delivered an opening address on the co-ordination of the teaching of hygiene. He said he took his appointment to the presidency as a proof of the importance the conference attached to the place of hygiene in any well-considered scheme of education. Amid the welter of conflicting opinions the subject in which that conference was chiefly interested had been steadily making its way to a position of more importance in educational curricula. Sanitary science had long occupied a relatively prominent position in this country, so that now the determination with which we insisted on sanitary precautions struck the foreigner with amazement. Average English opinion would not agree that in sanitary regulations the State or local authorities had outstepped the limits of their legitimate functions. But where there was not the same unanimity, as in the case of building laws, he deprecated risking reaction by moving too far in advance of public opinion. He gave reasons for assurance that the claims of hygiene in elementary school education were

being widely recognised, but observed a curious difference between the official theory of the Board of Education as to what was desirable in elementary schools and the practice followed in the education of the richer classes. He believed in the study of the elements of science, hygiene included, being carried on side by side with the study of language and arithmetic from a very early stage. He discouraged a too exclusive reliance upon compulsory examinations in the promotion of the study of hygiene, and detected the new system of the University of London against the supposition that in abandoning a particular method of enforcing its views it renounced its right to express opinions as to what was desirable in education or to use more legitimate methods of giving effect to those opinions.

He described and approved the Government regulations for training of teachers in hygiene, but regretted the small number of responses to the Sanitary Institute when it offered assistance as to the preparation and working out of schemes under these regulations. The magnificent gift of the Goldsmiths' Company to the University of London was to be utilised, in part, for the training of teachers for elementary schools. The scheme of education there hygiene would form an essential feature. The knowledge of school hygiene was required by authorities granting diplomas of education. He looked to the success of their endeavour for the reasonable cultivation of the study of hygiene not to be figuring in the list of subjects for matriculation, but to the steady pressure of opinion. It would insist, as they had insisted, that the elements of education should include not merely the study of other forms of life, but some knowledge of the dangers by which they were surrounded and of the means of keeping them away. They would insist that those to whom young lives were entrusted should have learned as part of their business, the main outlines of hygienic science; and in extending their influence farther than it had already reached they would go forward with the consciousness that a very short time the merits of their cause would already attained an amount of general acceptance which was as hopeful as in educational controversies it was rare.

On the motion of the Bishop of Wakeham, seconded by Sir Aston Webb, thanks were voted to the President for his address. A similar compliment to the Duke of Northumberland for his part in the initiation of the conference was passed on the motion of Sir W. Church, seconded by Mr. W. Whitaker, chairman of the conference committee.—Sir Lauder Brunton presided at Wednesday's deliberations on the subject of "Scholars."

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Mr. Williams Bann, M.P., Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to issue Fulham Borough Council 5,696*l.* for 3,600 works, and Hammersmith Guardians 4,000*l.* for poor law purposes (board room and office, etc.). Sanction was also given to the following loans:—Hampstead Borough Council, 11,450*l.* for housing purposes and 4,335*l.* for electric lighting purposes.

Works Department.—On the recommendation of the General Purposes Committee it was agreed that the following be a standing order of the Council:—

"The accounts of the cost of all works executed by the Works Department shall be kept by a Works accountant, whose office shall be at the Works Department, Belvedere-road, but who shall report direct and be responsible to the Works Committee for the accounts and subject to general supervision by the manager of Works, for his staff."

The Main Drainage Committee recommended, and it was agreed, that the estimate of 10,000*l.* submitted by the Finance Committee, be approved; and that expenditure not exceeding that amount be sanctioned on the account of the cost of the construction of the portion of the southern high level sewer No. 2, between Plumstead and Catford, and of the acquisition of property and compensation in connection with the said works.

Holborn to Strand Improvement.—On the recommendation of the Improvements Committee that a lease be granted to a Private syndicate for a site between Aldwych and Strand, for the purpose of erecting a Fine

atre, restaurant, art galleries, and industrial exhibitions.

Mr. Davies, the chairman of the committee, said that the whole matter might stand over a week.

This was agreed to. The contractor's Committee reported as follows:—

On July 5, 1904, and on January 24, 1905, we reported on the slow progress made by Mr. C. Wall in his contract for the erection of the superstructure of Vauxhall Bridge. We consider that the progress made has been by no means satisfactory. The contract was completed by the Council on October 20, 1903, but formal order to commence work was not given until May 1, 1904, as we desired to give the contractor a reasonable time within which to make his preliminary arrangements. The time fixed for the completion of work under the contract is two years from the date when the order to commence work was given. Therefore, the order to commence work should have been given by December 31, 1905. From the time, however, our attention has been frequently drawn to the unsatisfactory progress made by the contractor, we decided to build and erect the steel ribs himself, or then sublet this portion of the work to a firm experienced in work of this description and having plant and proper plant to complete it within the allotted time. It has been pointed out to us that one of the principal causes of the delay is the lack of adequate up-to-date contractor's plant at the bridge. Notwithstanding the fact that the contractor's attention has been drawn repeatedly to this fault, Mr. Wall has appeared to be at all willing to remedy the defect. In our opinion another reason for the delay is to be found in the fact that the contractor has appointed an agent to be in charge of the works as required by clause 24 of the contract. The contractor's representatives on the works are unable to carry out the instructions of the Council's officials without reference to the agent. The absence of a proper agent, with full powers to act on behalf of the contractor, both on the bridge and at the contractor's works at Crays, has caused upon the Council's officials additional delay with which they should not be required to deal. Appointment of such an agent would also facilitate co-ordination of the work in the several sections of the bridge. The absence of co-ordination of the contractor's staff, the absence of co-ordination of the work, no doubt, to Mr. Wall being compelled by his attention to his other contracts. The value of a work executed up to date at the bridge is approximately £8,547, or little more than 24 per cent. of the total sum, not including provision money, while the amount of the twenty-four fixed by the Council has elapsed. Even allowing for the amount of work done at Mr. Wall's yard at Crays, the progress in the erection of the superstructure gives one the impression that the work will not be completed until after the end of the year. The delay is a serious one to the Council, and will involve actual financial loss as the linking up of the Council's tramways on sides of the bridge at the point will be referred to the slow progress of the bridge works. We consider that the Council should draw Mr. Wall's attention to the serious delay, and that he should clearly understand that in the event of the work not being completed within the specified time penalties will be levied. The penalty provided in clause 36 of the contract is 100l. for each week the work is delayed after the specified time. We recommend—that, having regard to the terms of the contract between the Council and Mr. Charles Wall for the erection of the superstructure of Vauxhall Bridge, the attention of the Council be drawn to the serious delay which has occurred in carrying out the carrying out of the works, and the Council do inform Mr. Wall that, unless the work is satisfactorily completed within the time specified in the contract, the Council will enforce penalties.

After considerable discussion the recommendation was agreed to. **Non-Inflammable Scenery.**—Mr. Yates, the chairman of the Theatres and Music Halls Committee, in reply to Sir Algernon West, said that a rule was adopted some time ago that scenery should be rendered non-inflammable. The committee sent out a circular to all theatres ordering them to carry out that recommendation. He regretted, however, to find that these instructions had not been carried out as well as the committee wished, and in a report which was being prepared the actual causes of failure to comply would be pointed out.

Opening of New Theatres.—The Theatres and Music Halls Committee drew attention to the practice which obtained with regard to the opening of new theatres and music-halls. It is the custom for a person for whom a new theatre or music-hall was being erected to give many months beforehand, a date for the opening of the premises. Contracts with artists entered into, and all arrangements definitely made for opening on that date, which was often done upon without due regard to the exigencies of construction. It almost invariably happened that when the advertised date for the opening approached the building was in an unfinished condition, and it was only by a night and day that there was any possibility of getting it sufficiently finished for the Council to issue a certificate to enable it to be opened at the advertised time. The result was that the Council was asked to certify the building the moment it was completed, and only a few hours before the advertised date for opening. After reporting on what had taken place during Christmas as to five theatres of entertainment, which had been either

newly erected or reconstructed, the committee concluded: We think the Council will feel that the state of things which now generally obtains should, if possible, be altered, and that sufficient time should elapse between the completion of a building and the date upon which it is desired to open it for public entertainments to allow the Council's officers to survey the premises and report to us, and for us to make an inspection if necessary. We purpose informing owners in future that they must make such arrangements as will enable this to be done.

The Council adjourned at seven o'clock.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Fulham.—Buildings upon the site of Nos. 327 to 343 (odd numbers) inclusive, North End-road, Fulham (Messrs. Jones Brothers).—Consent.

Battersea.—A building at No. 33, Park-road, Battersea (Mr. E. S. Underwood for Messrs. Apin & Barrett and the Western Counties Creameries, Ltd.).—Consent.

Clapham.—Two houses on the western side of Rodenhurst-road, Clapham, to abut upon the northern and southern sides of Hambrook-road (Mr. T. Ward).—Consent.

Battersea.—Additions to the Battersea Town Hall, Lavender-hill, Battersea, to abut upon Town Hall-road and Theatre-street (Mr. T. W. A. Hayward for the Council of the Metropolitan Borough of Battersea).—Consent.

Hammersmith.—A projecting clock at No. 4, Shepherd's Bush-green, Hammersmith (Major Berthon for Messrs. Sainsbury Brothers, Ltd.).—Consent.

Lewisham.—Porches and barge boards at 12 to 12 (inclusive), Tansfeld-road, Sydenham (Mr. A. Cooper).—Consent.

Lewisham.—A porch over the entrance to a house adjoining "Oakdene," Canonbie-road, Lewisham (Mr. W. Preston for Mrs. Browne).—Consent.

Marylebone, East.—A projecting balcony, and projecting stone heads to a door and window under such balcony, at No. 32, Cavendish-square, St. Marylebone (Mr. W. H. White for Mr. W. A. Poole).—Consent.

Westminster.—A one-story shop on part of the forecourt of No. 121, Victoria-street, Westminster (Mr. M. T. Meredith for Mr. M. Power).—Consent.

Dulwich.—An iron and glass covered-way at No. 144, Croxted-road, West Dulwich, to abut upon Turney-road (Mr. F. N. Kemp for Mr. R. Downing).—Refused.

Islington, South.—A one-story shop and gateway at No. 363, Liverpool-road, Islington (Mr. H. O. Ellis for Mr. Curry).—Refused.

Paddington, South.—The retention of an iron and glass covered-way at No. 15, Porchester-terrace, Paddington (Messrs. Napper & Sons for Captain Dundas).—Refused.

Dulwich.—An iron and glass covered-way on the forecourt of "The Arlington" dancing academy, No. 80, Peckham-road, Peckham (Messrs. J. A. J. Woodward & Sons for Mr. W. F. Hurdall).—Refused.

Width of Way.

Hampstead.—The retention of a brick petrol store at "Northcroft," College Villas-road, Hampstead (Mr. W. Scott).—Consent.

Lewisham.—A church upon the site of Nos. 211 and 213, Sydenham-road, Lewisham, with a boundary fence at less than the prescribed distance from the centre of the roadway of Laurel-grove (Mr. R. Curwen for the trustees of the Lower Sydenham Wesleyan Church).—Consent.

St. Paneras, East.—That the application of Mr. T. B. Westcott for an extension of the period within which the erection of a two-story building on the north-east side of Rochester-place, Camden Town, was required to be commenced be granted.—Agreed.

Bethnal Green, South-West.—Buildings on the eastern side of Brady-street, Bethnal Green, to abut also upon Dagnall-place (Mr. A. P. Stokes for Mr. R. E. Soward).—Refused.

Paddington, North.—A building on the south-east side of No. 1, Warwick-place, Paddington (the Metropolitan Electric Supply Co., Ltd.).—Refused.

Line of Frontage and Space at Rear.

Battersea.—An addition at the rear of No. 127, St. John's-hill, Battersea, to abut upon Vardens-road (Messrs. J. A. J. Woodward & Sons for Dr. Wonnacott).—Consent.

Lines of Frontage and Construction.

Hammersmith.—That the application of Mr. I. Kiralfy for an extension of the period within which the erection of a gangway over Wood-lane, Hammersmith, was required to be commenced, and an extension of the period within which such gangway was allowed to be retained, be granted.—Agreed.

Norwood.—An iron building upon a site abutting upon Acra-lane and Brixton-hill, Norwood (Messrs. Humphreys, Ltd., for the London Evangelistic Council of Exeter Hall).—Consent.

Space at Rear.

Lewisham.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building at No. 235, Hither Green-lane, Lewisham, with an irregular open space at the rear (Mr. P. J. Black for Mr. E. Willson).—Consent.

Hammersmith.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of three houses on the east side of Willow-vaie, Uxbridge-road, Hammersmith (Mr. A. G. Channer for Mr. J. Watts).—Refused.

Formation of Streets.

Lewisham.—That an order be issued to Mr. R. Stewart sanctioning the formation or laying out of new streets for carriage traffic to lead out of the west side of Birkland-road to Downhill-road, Lewisham (for Mr. A. Cameron Corbett).—Consent.

Wandsworth.—That an order be issued to Mr. E. S. Trehearne refusing to sanction the formation or laying out of new streets for carriage traffic on the Templeton House Estate, Priory-lane, Roehampton.—Refused.

Means of Escape From the Top of High Buildings.

Strand.—Means of escape in case of fire proposed to be provided in the Waldorf Hotel, Aldwych (Messrs. A. M. Mackenzie & Son for the Waldorf Syndicate, Ltd.).—Consent.

Dwelling-house on Low-lying Land.

Rotherhithe.—Four buildings on low-lying land situated at Nos. 3, 5, 7, and 9, Cathay-street, Union-road, Rotherhithe (Messrs. Stook, Page, & Stook for Mr. W. L. Climpson).—Consent.

The recommendations marked * are contrary to the views of the local authority.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

On February 1 Mr. A. C. Dickie, A.R.I.B.A., read a paper before the Discussion Section of the Architectural Association upon "Steps and their Treatment," and illustrated his remarks by an admirable collection of photographs, drawings, etc. He divided his paper as follows:—Monumental, civic, ecclesiastical and domestic, fountains and open spaces, dealing thoroughly with each in its turn. The monumental type was instanced by the Pyramids and many other examples culled from the East. The speaker next touched upon the steps of the Greek temples, and then passed on to Roman forms. He next described the treatment of the stepped streets of Malta and others like European examples, and, following this, commented upon the treatment of approach to buildings by broad flights of steps. The Renaissance period was next put under contribution, many interesting and instructive examples being mentioned, and pointed out by means of the illustrations gathered together by the speaker. The major part of these were drawn from Italian sources, the most noticeable being Michelangelo's famous steps to the Biblioteca Mediceo at Florence. English domestic work provided a number of good examples, and these Mr. Dickie commented upon at some length, drawing upon such well-known instances as Lord Burlington's villa, Chiswick; Prior Park Bath; Orangery, Bowood. The speaker then, by means of diagrams, showed the various forms of steps, and pointed out the advantages and disadvantages of each. In concluding, he said that perhaps the crux of the whole matter lay in the fact that "By some steps you wish to get there, by others you have got to."

Mr. Louis Ambler, in opening the discussion, regretted that, having only seen the paper that day, his remarks would be somewhat fragmentary. At first sight the subject seemed simple, but, when considered, the enormous number of forms alone was wonderful. He thought that the steps (or stylobates), usually three in number, of the Greek temples suffered

* We give only a short résumé of the paper, as we hope to find space afterwards to publish it in full.—Ed.

from the practical point of view by being too high, and was of the opinion that the Roman examples were better, as being generally shallower. He noted in Mr. Dickie's paper a marked absence of reference to Italian examples, such as the Palazzo Pubblico at Perugia, which was extremely picturesque. The dictum laid down by some authorities as to the imitation in number of steps must, he thought, in view of the numerous successful examples shown that evening upon the screens, give way in measure to a greater latitude. As a contrast to the foregoing, he considered that some cases, notably the celebrated fountain at Viterbo, suffered very much from too many steps, and the one at Guingamp from the absence of any form of steps. In connexion with this, he had noted the comparative absence of steps in the designs of Gothic cathedrals and churches. He also noted that Mr. Dickie had made no allusion to stairs in turrets, of which there were a number of well-known examples, such as the one at the Minelli Palace, Venice, and the Château Blois. Mr. Ambler touched upon a number of French, Italian, and English Renaissance examples, and, in conclusion, referred to the alteration to the steps of St. Martin-in-the-Fields as being unfortunate, inasmuch as the landing on the west side had been removed but the return piece on the south side had been retained.

Mr. Theodore Fyfe gave some interesting facts about the subject, notably in regard to the island of Crete, where one magnificent flight he had seen had a width of 45 ft., the risers being 5 in. and treads 15 in., the latter being slightly weathered. This flight was very easy to mount, due, he thought, to the proportion of tread to riser. He considered the Albert Memorial was a successful modern example, but those at St. George's Hall, Liverpool, the reverse. The steps shown on Mr. Dickie's plate of the Parthenon seemed all too narrow for the purpose.

Mr. F. Lishman drew attention to the satisfactory effect of the blocks to sides of steps in Wells Cathedral leading up to the chapter-house, and thought the steps up to the choir at Canterbury Cathedral exceptionally fine. He agreed with Mr. Fyfe as regarded the Albert Memorial, but regretted the placing of the upper and lower railings to the flights, which marred the complete effect. He failed to see any advantage in weathering the treads of steps.

Mr. A. H. Belcher said that some buildings could be dissociated from their bases of steps without the difference being very noticeable, but others, obviously planned in conjunction with them at the outset, could not, and gave, as an instance of this, Prior Park, near Bath. Another example was that of the Cathedral of St. Gudule, at Brussels.

Mr. H. Gregory Collins (Chairman), in calling upon Mr. Gerald C. Horsley to sum up the discussion in his capacity of Special Visitor, regretted that the lateness of the hour prevented him from joining the discussion, as it was a subject he had a considerable interest in, both practical and artistic.

Mr. Horsley, in speaking, expressed the thanks of the meeting to Mr. Dickie for his interesting paper, but said it left them, so to speak, upon the fringe of the matter, but he trusted that at some future date it would be amplified. Mr. Dickie, he thought, had shown wisdom in confining his remarks that evening to external steps, for, had he not done so, such a paper would not have been possible in the limited space of time. He fancied some of those present might be labouring under a misapprehension regarding the question of the Greek stylobates to the temples, these being intended more in the nature of pedestals or plinths than steps. In a German restoration of the Temple of Zeus, Olympia, the central part of the stylobate was shown as given up to an inclined plane. He thought the interiors of the temples were not much used, the altars being outside and, consequently, steps such as understood to-day were not greatly needed. In reference to Mr. Fyfe's remarks about the steps to the south front of St. George's Hall, he wondered whether the author of the design had not intended the side flights for spectacular use, whilst reserving the central flight for processional purposes. The same idea could be traced in Michaelangelo's beautiful steps at the Laurentian Library. As a comparison, unfavourable, he regretted to say, to us, between the satisfactory form of the Italian steps and the unsatisfactory form of English, he would mention those at Lincoln and Hastings, which, with their steep risers and insufficient treads, contrasted badly with the low risers and broad treads of Italian examples. An interesting

point to note was that many of the steps in this latter country, constructed in times past, were intended for horse or mule traffic, just as was the case in our own west country town of Clovelly. A feature of Italian work was the use of the inclined plane for mounting heights in a building such as obtained in the recently destroyed Campanile at Venice, and many other examples abounded. He thought that perhaps the dictum spoken about by some of the earlier speakers had reference to internal and not external steps, but, personally, he deprecated the use of more than twelve or, at most, fourteen steps in a flight, for anything beyond this was most formidable to persons advancing in years. In concluding, he would offer the advice to study the examples of Michaelangelo and carefully avoid the excesses practised during some periods, such, for example, as the double ogee type of the French Renaissance period.

A hearty vote of thanks was unanimously carried, both to Mr. Dickie for his paper and Mr. Horsley for his address, and, after Mr. Dickie had briefly replied, the meeting terminated.

ARCHAEOLOGICAL SOCIETIES.

ROYAL ARCHAEOLOGICAL INSTITUTE.—At the meeting on the 1st inst., Sir Henry Howarth, President, in the chair, a paper on "Japanese Sword-blades," with lantern illustrations, was read by Mr. Alfred Dobrée, who also exhibited several fine specimens. After remarks by the President, who exhibited three Japanese swords, the discussion was continued by Lord Dillon, Mr. Rice, and Mr. Worsfold.

THE SANITARY INSPECTORS' ASSOCIATION.

THE twenty-second annual dinner of the Sanitary Inspectors' Association (Incorporated) was held on Saturday last week in the Venetian Chamber, Holborn Restaurant, W.C. In the unavoidable absence of the President (Sir J. Crichton-Browne, F.R.S.) the chair was occupied by Sir Hugh Gilzean Reid, D.L., LL.D., past-President of the Association, and there was a large number of members and friends of the Association present, including Sir Lauder Brunton, M.D., F.R.S., Sir Shirley F. Murphy, L.C.C., Dr. T. O. Duffield, Dr. Parkinson, Dr. Sykes, Alderman J. McLauchlan, Alderman Francis, and Messrs. G. H. Anderson, Andrew Clarke, M.D., T. G. Dee, G. Elliston, G. Laurence Gomme, C. Grey, H. Johnson, J. Pearce, L. Potts, J. T. Quinton, J. Milson Rhodes, M.D., E. White Wallis, W. Watkins, J. Smith Whittaker, W. Whittaker (Chairman of Council, Royal Sanitary Institute), I. Young (Chairman of Council), E. C. C. Tidman (Secretary), and several mayors of Borough Councils.

After dinner, the Chairman said his first words to them that evening—and he was sure they would express the sentiments of everyone present—would be an expression of sorrow, for they had not there with them their late secretary and friend, Edward Tidman. He had known Mr. Tidman from boyhood, and had traced all the steps of his career, and had known him always as a true friend, and a capable expert in his profession, and a devoted servant for the people. They all deeply regretted the loss of Mr. Tidman, and the only compensation they had was that his son had been appointed to succeed him.

The loyal toast having been honoured, Alderman Francis, ex-Mayor of Southend-on-Sea, proposed the toast of "Local Government," and in doing so said he appreciated the chairman's remarks about their late secretary. He knew full well that Mr. Tidman's interests were bound up in the success of the Association, and he ventured to suggest that they could show their regard for him by doing all they possibly could to further the work he had so much at heart.

Sir Shirley F. Murphy, in reply, said there had perhaps been no greater event in the history of the country than the development of local government within recent years, and it would have been impossible for the country to have made the progress it has made if communities had not been permitted to govern themselves. But however much local government might develop, it would always need the help of medical officers of health and sanitary inspectors, and it was necessary for them to keep ahead of existing knowledge, and well informed on all technical matters on which they might have to advise their Councils. Efficiency and integrity were the two qualities needed, and

without them not only would officers fail, but local government also. There was no question that confidence existed now as to local government.

Mr. G. Laurence Gomme, Clerk to the L.C.C., also replied, and remarked that in his opinion many matters now attended to by Parliament would in time be dealt with by local parliaments, and as officers they should make themselves capable of dealing with any new powers which might be given to them. He strongly believed that Englishmen were capable of governing themselves—in local as in Imperial government.

The Chairman then proposed "The Sanitary Inspectors' Association." He said that the membership of the Association had been steadily increasing all the time, but within the past two years a new departure had been taken. Last year they effected one or two amalgamations which had enabled them to carry out a scheme which had hitherto been impossible, i.e., to divide the whole of England and Wales into districts or centres, so that the Association covered every part of the country with local representatives who knew the local requirements. This was giving, and would give, a life and vitality to the Association which it was impossible for it to possess when merely worked from the centre in London. They had also arranged to affiliate with the Inspectors' Association in Scotland, and the principle of decentralisation on which they had been working would make the Association a living power in every part of the Kingdom. The British Medical Association had promoted a Bill in the next session of Parliament the object of which was to amend the law relating to the tenure of office of medical officers of health and sanitary inspectors. The object was to define legally the qualification of medical officers and sanitary inspectors, and to obtain security of tenure in their respective offices. He hoped to see the Association take another step forward and obtain a Royal Charter of Incorporation which would legally define the position of the sanitary inspector, would give him a recognised professional status, and would bring to him privileges and powers akin to those possessed by the Royal Academy of Arts and our great Universities. The Association meant to go forward and become recognised as one of the great permanent institutions of the country. With the toast he coupled the name of Mr. Isaac Young, who, to his knowledge had rendered great services to the Association.

Mr. Young, in response, first referred to the loss the Association had sustained in the death of Mr. Tidman, who had laboured well for the Association for a number of years, and under whose guidance the Association had made excellent progress. The loss they had sustained could not yet well be made good by anyone inside or outside the public health service, but they had appointed Mr. E. C. C. Tidman to succeed his father. Mr. Tidman had for the last two and a half years carried out the duties of his father in an excellent way.

During the past three years the work in the Association had been exceptionally heavy. They had altered the articles of association and had created the National Union of Sanitary Inspectors, and since then they had been joined by the South Wales and Monmouthshire Association, and had arranged a scheme of federation with the Scottish Association. They would now be able to settle down to some useful work in their own cause and in their own purpose. As to the security of tenure of office, officers were not able to charge their duties because of vested interests and the consequence was that the public health service was jeopardised. If Parliament would not give them security of tenure then the whole of the local government should be transferred to a central authority. From an almost any point of view, and in the interest taken in the meetings, the visit to Bournemouth last autumn, and the previous similar meetings. They had in the Association about 1,000 members, and before the next annual meeting they hoped to increase that membership by 300 or 400. They were determined to secure for themselves that recognition which they undoubtedly ought to have, not only from the public, but from the powers that be.

Dr. Sykes then proposed "Science and Art," coupled with the names of Sir Lauder Brunton and Mr. Andrew Clarke, M.D. In the course of his remarks he referred to the improvement of the class of men who formerly served the public in the capacity of medical officers, sanitary inspectors, and surveyors, especially in small

districts, compared with those officers of the present day. The toast should really be "science and art of hygiene and sanitation."

Sir Lauder Brunton, in reply, said that the three arts—painting, sculpture, and architecture—were all very advantageous to man, and gave a very great deal of pleasure. They had little to do with painting and sculpture and a great deal with architecture, and he called attention to an exhaustive little book by Dr. Sykes in which the author traced the history of architecture from the earliest to civilised times. There was one art which more than any other engaged the attention of other men and women, and that was the art of prolonging life; but although this art had been practised for unknown thousands of years, they had not attained to very great perfection in it. Science gave the general rules, but it was the individual who practised the art. He hoped the Association would be successful in their endeavour to carry this art to perfection, and enable people to live up to and beyond 100 years of age.

Dr. Clarke said that as a medical student he used to be struck with the artistic drawings on the blackboard of anatomical subjects. It was the desire of the British Medical Association to assist not only medical officers of health, but sanitary inspectors also in regard to the matter of security of tenure of office. They knew that the subject was of very great importance, and they hoped that the Bill which had been promoted would be of some use.

Alderman Jeffreys, Mayor of Chelsea, in proposing "Kindred Associations," said he agreed as to the necessity of security of tenure of office for sanitary inspectors.

Dr. Parkinson, M.O.H., in reply, said that the Bill for securing tenure of office had been before Parliament many times, and it contained a proviso for superannuation which had proved a hindrance to the passing of the Bill, and they would have to drop that part of it in order to secure the principle of tenure of office. They had greater hope of passing the Bill than ever they had before, for it was recognised as being necessary by some of the officials of the Local Government Board. The British Medical Association hoped that Mr. Long would receive a deputation, and they hoped to be joined by the Sanitary Inspectors' Association and other kindred bodies. He congratulated the Association on the way in which it was managed.

Mr. Whitaker, F.G.S., also replied, and referred to the improvement of the class of sanitary inspectors of to-day compared with those of ten years ago; no doubt they would continue to improve, and it was good that they should have an association to look after their interests.

Dr. R. Duffield said he wished the British Medical Officers of Health and the Association of Sanitary Inspectors were more closely united, but he feared it was too late now to merge the two.

The concluding toasts were "The Visitors," proposed by Mr. J. T. Quinton, and responded to by the Mayors of Kensington and Bethnal Green; "The Chairman," proposed by Mr. G. H. Anderson; and "The Press," proposed by Mr. T. G. Dee, Hon. Treasurer.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—The first ordinary meeting of the Society of Engineers for the present year was held on Monday, the 5th inst., at the Royal United Service Institution, Whitehall. Mr. D. B. Butler, the President for 1904, first occupied the chair, and presented the premiums awarded for papers read during that year, viz.:—The President's Gold Medal to Mr. William Edward Storey for his paper on "Condensing Machinery"; the Bessemer Premium of Books to Mr. R. G. Allanson-Winn for his paper on "Deep Sea Erosion and Foreshore Protection"; a Society's Premium of Books to Mr. A. S. E. Ackermann for his paper on "British and American Coal-cutting Machines"; and a Society's Premium of Books to Mr. Frank Latham for his paper on "Some Recent Works of Water Supply at Penzance." The thanks of the Society were also accorded to Mr. H. C. H. Shenton for his paper on "The Latest Practice in Sewage Disposal"; to Mr. Percy G. Scott for his paper on "Railway Surveys and Design in New Countries"; to Mr. James Thame for his paper on "Recent Developments in Crushing and Concentrating Machines"; and to Mr. Perry F. Nurse, Past-President and Secretary, for his "Jubilee

Retrospect," being a brief history of the Society from its inception to date. Mr. Butler then introduced the President for the present year, Mr. Nicholas James West, to the meeting and retired from the chair, receiving a hearty and unanimous vote of thanks for his services during the past year. The President then proceeded to deliver his inaugural address, in which he dealt mainly with the mechanical side of engineering, with reference to the historical use and improvement of pumping and marine engines and the application of the latter at various periods to vessels of different kinds, and he included a reference to the latest phase of turbine propulsion. He first gave a historical account of Cornish pumping engines, tracing their gradual development at the hands of Savery, Newcomen, Trevithick, Watt, Hornblower, and Woolf, and describing the inventions and adaptations of those pioneers of steam-pumping engines. He noted as an interesting point that, incredible as it might seem, for fifty years the use of the steam engine was confined to the pumping of water. It was not until 1780 that rotary motion was obtained from the steam engine by means of a crank. Watt objected to the use of his engine, if the crank was attached to it, and invented the sun-and-planet wheel in place of the crank. In 1837 Cornish engines were first introduced for pumping water for the supply of London at the East London Waterworks. One was purchased in Cornwall having a 90-in. cylinder and a 10-ft. stroke. It worked most economically for twenty-five years, and was only removed when the pumping works were closed in 1892. This class of engine is extensively used by the large London and other water companies. The President then referred to the Severn Tunnel pumping plant, which, he observed, was the largest pumping plant of which he knew. It was installed at each side of the Severn Tunnel on the Great Western Railway. It is entirely of the Cornish type, and the engines and pumps have a total pumping capacity of 66,000,000 gallons in twenty-four hours. The quantity dealt with under ordinary circumstances varies from 16,000,000 to 34,000,000. The President observed that he was connected with that installation from commencement to finish, a period of about thirteen years. The remainder of the address dealt with the subject of marine propulsion.

THE INSTITUTION OF CIVIL ENGINEERS.—At the ordinary meeting on Tuesday, the 7th inst., Sir Guilford L. Molesworth, President, in the chair, it was announced that nineteen associate members had been transferred to the class of members, viz., Messrs. William Bates, E. T. Beard, O. F. L. W. Cuffe, C. R. Fenwick, C. O. Grimshaw, D. J. Highet, J. N. Kirby, C. N. Lailey, O. C. Lees, C. F. Marsh, E. H. S. Napier, H. W. Parkinson, J. S. Pickering, Arthur Powell, Theodore Pridham, George Rankin, P. J. Sheldon, A. T. Snell, E. R. Waight. It was also reported that sixteen candidates had been admitted as students, viz., H. L. Byrd, C. C. Carney, G. C. Carson, F. J. Collier, B. G. Cooke, F. R. Gibbins, A. F. J. H. Harrison, T. B. Keen, Lionel Page, A. E. Paul, B. A. G. B. Rolfe, G. W. N. Rose, B.Sc., T. B. Stewart, T. F. Tomlinson, H. B. Ward, B.Sc., and P. E. Williams. The monthly ballot resulted in the election of seven members, viz., Messrs. F. Hellmann (Transvaal), J. B. Hunt, J. Inglis, D. Macdonald (Hong Kong), C. B. Smith, M.A. (Toronto), J. F. Sorzano (New York), and G. W. Wolff, M.P. Twenty associate members were also elected, viz., W. H. C. Clay, Stud.Inst.C.E., J. L. Cridlan, Stud.Inst.C.E., H. Dalgarno-Robinson, J. D. D. Davis, Stud.Inst.C.E., T. S. Ennis, B.E., Don E. Ferro, B.A. (Colombia), E. P. Harvey, B.A., A. G. F. Heather, Stud.Inst.C.E. (Transvaal), L. H. L. Huddart, B.A., Stud.Inst.C.E. (West Coast Africa), W. C. Isle, B.Sc. (Victoria), Stud.Inst.C.E., J. M. Mackay, Stud.Inst.C.E., M. S. McKay, B.A., B.A.L., R. C. S. Murray, B.A., Stud.Inst.C.E., I. V. Robinson, Stud.Inst.C.E., G. W. Shearer, B.Sc., A. O. Sherrin, Stud.Inst.C.E., E. D. Simon, B.A., Stud.Inst.C.E., P. B. le D. Tree, Stud.Inst.C.E. (Punjab), R. P. Wilson, W. R. Wilson, B.Sc. (Orange River Colony); all of Great Britain except where otherwise stated.

APPOINTMENT.—Mr. Henry Adams, M.Inst.C.E., etc., and until recently Professor of Engineering at the City of London College, has been appointed a Chief Examiner in Building Construction to the Board of Education, South Kensington.

Books.

Lives of the Engineers: Vermuyden—Myddelton—Perry—James Brindley. By SAMUEL SMILES. Popular Edition. London: John Murray, 1904.

NEARLY fifty years ago the author published the life of George Stephenson, and the lives of other engineers followed, forming a complete series. The original edition being exhausted last year, the work is now republished in popular form. Some modifications have been made, but essentially the original narrative remains unaltered. The book which we have received is simply one of five volumes, and for this reason we are unable to notice more than a small part of the complete work.

In early times reliance was placed almost entirely upon foreign engineers for works of embankment and drainage, and particularly upon the Dutch, for whom Sir Cornelius Vermuyden was a worthy representative. The great works of reclamation inaugurated by this indefatigable engineer are fully recounted by the author. Among these the chief were the drainage of Axholme, on the borders of Yorkshire and Lincolnshire, and of the great Fen Level, the final reclamation of this area in later years having added 680,000 acres of most fertile land to the natural wealth of the country.

Sir Hugh Myddelton, another early engineer, is famous as the creator of the New River, the construction of which is adequately dealt with in the life of this pioneer, who afterwards devoted himself to various other engineering works in the way of land reclamation and mining. Captain Perry is the next example taken, and in his life the reader will find most interesting material relative to the great breach in the river Thames at Dagenham, which resulted in the ruin of a thousand acres of agricultural land, and in the formation of a bank half-way across the river to the serious interruption of navigation. This breach, which for years defied the engineering talent of England, was finally stopped by Perry in 1719. In the next chapter, the author discusses briefly, "The Beginnings of Canal Navigation," afterwards commencing the "Life of James Brindley," in seven chapters, which, with the exception of an appendix, occupy the remainder of the present volume. As the engineer of the Bridgewater Canal, the Grand Trunk Canal, and many other inland waterways with a total length of nearly 370 miles, and the consulting engineer to various canal projects, Brindley may be characterised as one of the greatest among early English engineers, and the excellent memoir of him presented by the author affords interesting as well as most instructive reading.

Few of the men whose lives are recorded by Dr. Smiles belonged to the educated classes. Some could scarcely write their own names, but, being born engineers, they rose to eminence by the help of observation, sound judgment, tireless industry, and indomitable perseverance. Their lives will continue to be read with pleasure by all true Englishmen, and should be studied by every engineering student and young engineer who is not already familiar with them.

Since the above was written, we have received the second volume of the same series containing the lives of Edwards, Smeaton, and Rennie. The sketch of the former is, however, only a kind of appendage to a historical sketch of the difficulties with harbours, beacons, and bridges in the pre-engineering days of England, with a chapter devoted to old London Bridge. There is curious oversight on page 68, where it is stated that in the bridge at Llanrwst, said to have been designed by Inigo Jones, "the pointed arch is no longer adopted, but three segmental arches," while on the previous pages is the view of the bridge with three pointed arches! This looks as if Smiles got up his facts independent of the illustrations, or did not understand the latter. The name of Edwards, the Welsh bridge-builder (born 1719), is nearly forgotten now, but he was a man of courage and resource, and his Pont-y-pridd bridge, with its arch in one span of 140 ft., was a remarkable work, which still stands, though its formidable gradient led to the building of a modern bridge alongside of it with a more level road-way, the original work being fortunately left as a monument of its author.

With the life of Smeaton we come nearer to the times of modern engineering. A good sketch is given of the history of Winstanley's and Smeaton's Eddystone lighthouses. The illustration of Winstanley's lighthouse, which was swept

away, with the too confident designer, in a gale, suggests the lesson of not attempting to make a thing ornamental when it is a question of stability only. His Chinese-pagoda kind of erection seems the last thing that one would expect to withstand the assault of heavy seas. Rudyard's lighthouse, which succeeded it, though still of timber, was a much more practical affair, and apparently might have stood for long had it not caught fire and been burned down. Smeaton's great work is still of practical interest, and is well described, and a plan of one story is given showing its remarkable construction. The accounts of the building raised great interest at the time, and Smeaton's rooms were thronged with visitors to see the model, though his success does not seem to have brought him much work at the time.

Rennie's engineering work was so varied and extensive that even a popular account of it can hardly be adequately given within the limits allowed in this volume; but the general reader may obtain from it a fair estimate of the man and his work. In fact, during a considerable part of his life Rennie's directing mind was almost everywhere in engineering work, in drainage, harbours, and bridges. There are important bridges of which his authorship is mostly forgotten; and, on the other hand, works of which the design was probably his but of which some one who carried them out got the credit. One incident in regard to Plymouth breakwater is interesting as illustrating both Rennie's perception, and the manner in which the forces of nature found out his opponents; for Rennie has advised a slope of 5 to 1 on the sea face of the breakwater, which was commuted to 3 to 1, for economic reasons and against his judgment. However, after a portion of it had been built on the 3 to 1 slope, a night's gale raked it down to 5 to 1, thus conforming the engineer's prescience; and the joint advice of Rennie and the sea was accordingly followed.

Papers of the British School at Rome. Vol. II. By T. ASHBY, Junr., M.A., F.S.A., Assistant Director of the British School at Rome. London: Macmillan & Co. 1904.

THE second volume of the papers of the British School at Rome deals entirely with one subject, the notes and explanations in regard to a set of original architectural drawings of the Renaissance period, which form a portion of the hidden treasures of the Soane Museum. Thus the material for the latest publication of the School at Rome comes from a museum in London; but it quite falls within the programme of the school, and they have done a service in publishing this very interesting set of drawings.

The portfolio containing the drawings was bought at Robert Adam's sale in 1818, and appeared in the catalogue as "*Architettura Civiltà*," a volume containing measurements and sections of celebrated ancient edifices by a Florentine architect. Whether the supposed author of the larger proportion (for there are two hands in the collection) could be rightly called "a Florentine architect" may be a question. If Mr. Ashby's attribution of the authorship is correct he was more probably a German, and not even residing in Florence. None of the sketches are signed, and the only clue to the authorship is that one of the sheets is a copy of a letter from one Andreas Coner, written in Italian and dated from Rome, addressed to Bernard Rucellai of Florence, describing an ancient Roman sundial of which one drawing appears in the collection, but four drawings are mentioned in the letter. The letter is a copy, as it bears the heading, "Lettera d'Andrea Conero a Bernardo Rucellai." This does not seem very convincing as to the authorship of the drawings, but as nothing is known of Coner in any other way it perhaps does not very much matter; and it is convenient to call them the Coner drawings, whether we accept the name as that of the author or not.

The drawings are numbered in order, but not in the hand of the author, so that they must have been collected and numbered by someone else. The originals are about 9 in. high by 6½ wide; sketch book leaves, many of them drawn on both sides. They have been reproduced to a size about five-sixths that of the originals.

Most of them are drawings of portions of Classic buildings, sketches and sections of cornices, capitals, etc.; a certain number of plans, and some interesting perspective sketches of considerable portions of a building, notably an admirable one of part of the interior of the Colosseum, part section part view, which as a

sketch is masterly, and shows a very practised hand. The drawings of cornices and entablatures are for the most part carefully figured as to heights and projections; the whole are evidently the work of an architect.

Any such collection from the Renaissance period is, of course, interesting to possess in fac-simile; it seems to take us back into the artistic life of the time. There are some, however, which are of special interest. There is a plan of St. Peter's which Baron de Geymüller (and there can be no better judge) is certain has been copied from one of Bramante's, and shows one stage in the working out of his plan. There is a sketch of the wall under the portico of the Pantheon indicating the decorative marble panels between the pilasters, which are now gone.

There is a very fine sketch of the entablature and capitals of the Basilica Æmilia; the correctness, Mr. Ashby tells us, has been proved by some fine fragments recently discovered. There are some fine sketches of entablatures not recognised, which may be original designs. There is a remarkable head of a female Caryatide, of which the original is lost, but which is said to be evidently the model for the Caryatides by Raphael in the Stanza d'Eliodoro; and we should surmise that the Caryatides of the Erechtheion had furnished the suggestion for this one; the similarity in general character is remarkable, in spite of differences of detail.

Mr. Ashby's notes on the drawings show that he has made himself acquainted with almost all documents and drawings bearing on the subject. In every sense the volume does honour to the British School at Rome, and forms an important addition to architectural literature.

Fifty Years Ago.

THE BRITISH INSTITUTION. Little can be said congratulatory of the majority of the works here appertaining to the historical or subject class. *Mediocre* would be a polite term to apply to them. Even the few that assert a claim to be looked at and admired, excepting one or two instances, emanate from those from whom more might be expected. Not many years ago the opening day of the British Institution used to be anticipated with a pleasure and excitement only second to that which awaited, and still awaits, happily with growing cause, the annual gathering by the Royal Academy. Then it was customary with our first painters to contribute. Macise, Landseer, Collins, Etty, Stanfield, Roberts, Poole, Danby, Finnell, Martin, and other names of equal celebrity were naturally looked for and found in the catalogue. Who now are their substitutes? Is it not extraordinary that amongst the half score of rising men, who year after year complain of neglect on the part of Royal Academy jurors (because they, having barely space for six pictures, are expected to award good positions to twelve, and fail sometimes in pleasing all), some do not avail themselves of this gallery to be seen to advantage? Whether they may have been deterred from exhibiting by instances of injustice on the part of former hanging committees, or whatever may be the cause, certain it is, they do not come here, and the value of the exhibition is not maintained.—*The Builder*, February 10, 1855.

Illustrations.

ILLUSTRATIONS OF BAALBEK.

THE first three of these plates are given as illustrations of the important paper by Mr. Spiers which forms the second article in this issue.

The fourth illustration, that of part of the Temple of Jupiter, is not directly connected with the main subject of Mr. Spiers's article—the trilitheon; it is added as giving an illustration of more directly architectural character than the others; but it also bears on the subject of the great size generally of the stones used in the structures at Baalbek. On this point Mr. Spiers writes:—

"Fergusson, in his *History of Architecture*, commenting on the immense size of the stones composing the trilitheon, says: 'It is true that in many places in the Bible and in Josephus nothing is so much insisted upon as the immense size of the stones used in the building of the Temple and the walls of Jerusalem, the bulk of the materials used appearing to have been thought a matter of far more importance than

the architecture. As it is, there seems no reason for doubting their being of the same age as the Temples they support, though their use is certainly exceptional in Roman buildings of this class.' Now, although the dimensions of the stones of the trilitheon are far greater than others employed in the structure, the walls of the lower portion of the whole acropolis up to a level of about 30 ft. from the ground are built in courses the height of which varies from 3 ft. to 6 ft. The substructure of the propylæa, for instance, which is 25 ft. high, has only four courses, which, therefore, average 6 ft. 3 in. each.

In the Temple of Jupiter, the stones which constitute the architrave and frieze of the entablature are worked out of blocks which measure 8 ft. in height, 7 ft. in thickness, and 16 ft. in length, and they are raised to a height of 97 ft. from the ground. The stones occupying a similar position in the great Temple of Jupiter Sol are, of course, still larger in their dimensions."

PROPOSED BRIDGE, AYLESFORD.

WE gave in our issue of September 17, 1904, an illustration of the picturesque old mediæval bridge at Aylesford, the threatened removal of which had occasioned strong expressions of regret in many quarters, in which we fully concurred. After a special visit to the place, we came to the conclusion that there were no obvious practical reasons for the removal of the bridge which could in any way compensate for the destruction of so charming and picturesque a bit of old England.

The design for a bridge here illustrated is the one which was selected in the competition opened for a new bridge by the Town Council of Maidstone, when the unfortunate idea of destroying the old bridge first occurred to them. We refer to the subject of the old bridge and an illustration of it in order to point out that, in giving an illustration of the proposed new one, we are not for a moment wishing to support the scheme. On the contrary, we hope it will never be carried out, seeing that this will involve the destruction of the old bridge and of the greatest element of the picturesque in connection with Aylesford; something will be lost which cannot be replaced.

On the other hand, this is a very good specimen from an engineering point of view, of a masonry bridge for a small navigable river; it is not always that we have an opportunity of illustrating a constructional scheme of this kind; and from the architectural point of view is wholly unobjectionable; it is quite simple and straightforward in treatment, and not vulgarised by any misallied ornament. It is a bridge we should be quite willing to see built in any position where an old and picturesque one was not sacrificed for the sake of it.

The principal practical improvement is in the increased width of roadway and waterway, but as far as one day's observation goes we should have said that both widths are more than required by the existing traffic, Aylesford being apparently about as sleepy a little town as one could well come across. One of the complaints against the existing bridge is its gradient, but it will be seen by the small comparative diagram that the gradient for the proposed new bridge is slightly steeper than that of the existing one.

The requirement in the competition was that the width of the roadway was to be 30 ft. with a footpath of 5 ft. wide on each side and that the river was to be spanned by a single arch of not less than 100 ft. clear opening at high tide, with a headway equal to that of Rochester bridge. It was subsequently proposed, in order to lessen the cost, to reduce the bridge to 34 ft. total width and 16 ft. headway.

The engineers' estimated cost of the bridge and approaches is 27,885*l.* Other miscellaneous contingent expenses connected with alterations in adjoining properties, compensation, etc., would bring it up to 37,000*l.*

The scheme had to have the concurrence of the County Council and of the Rochester bridge wardens, as well as that of the Maidstone Town Council. In what position it now stands we are not able to say.

THE LATE J. T. WIMPERIS AND THE INSTITUTE.—It is stated that the gross value of the estate of the late John Thomas Wimperis, F.R.I.B.A., amounts to 51,430*l.*, and that dispositions comprise a bequest of 1,000*l.* to the Royal Institute of British Architects for the purpose of promoting the study of architecture.

COMPETITIONS.

OFFICES, WALLASEY.—It is stated Sir William Emerson, the assessor appointed by the Wallasey District Council to allocate upon the plans received for the new offices proposed to be erected on the Made estate, Seacombe, has awarded the first premium of 250*l.* to Messrs. Briggs & Jenhams, of North John-street, Liverpool. Other premiums of 75*l.* and 50*l.* are awarded to A. R. Jennett and Mr. G. T. McCombie, Little College-street, Westminster, London, Mr. W. H. Ashford, of Messrs. Ashford & Co., 90, New-street, Birmingham. No more than 96 designs were sent in.

LYNSHAM-ROAD SCHOOLS, CHELTENHAM.—result of the competition for these schools follows:—(1) Messrs. Chatters & Smithson (Cheltenham); (2) Messrs. Healing & Overbury (Cheltenham and Gloucester); (3) Mr. H. E. Under (Walsall).

COFFEE COTTAGE HOSPITAL.—On the 6th at a meeting of the trustees of the proposed Coffee Cottage Hospital, the competitive plan submitted by Mr. Edward C. H. Maitland, Edinburgh, was selected from among 12 designs. The hospital, which is estimated at about 1,000*l.*, will be erected on a site which has been acquired on the Selkirk-road.

NEW LIBRARY, NELSON.—The following, addressed to Mr. George Brown, Hon. Secy. of the Competitions Committee of the Chester Society of Architects, has been rendered to us:—

"Town Hall, Nelson,
February 2, 1905.

FREE LIBRARY.

Adverting to your letter of January 24 ultimo, and to the information therein given regarding the plans, and to the persuasive arguments of Mr. W. H. Willoughby, who happened to be here upon a matter a day or two later, my Council have decided the condition as to remuneration, and now amended same by allowing 1*l.* per cent. for fees. A post-card, notifying this alteration, has been sent to each applicant for the conditions, and I will be quite satisfied.

Yours faithfully,
J. H. BALDWIN,

Town Clerk.

BROWN, Esq.,
8, Exchange-street,
Manchester.

We are glad to learn that the Committee has been successful in securing proper terms for the architects in this competition.

LIBRARIES, BELFAST.—The plans of Messrs. W. Watt & Tulloch, of Belfast, have been selected in the competition for three free Branch Libraries at Belfast. Sir W. Drew was the assessor.

Correspondence.

THE "WELL FIRE."

—On reading a report of a meeting of the Architectural Association,* which appeared in issue of January 28, we noticed some points which appeared to be detrimental to the "Well Fire," and which, if left uncorrected, will no doubt, give your readers an impression that the "Well Fire" is a dangerous form of fireplace, and a common cause of fire in dwelling-houses.

The first place it is necessary to state is that the "Well Fire" is not a new term, and that there is only one type of which we are the sole proprietors. We find it necessary to emphasise this statement, because of late quite a number of other low types of fireplaces, of which include the essential feature of the "Well Fire," have been indiscriminately called "Well Fires," and consequently the "Well Fire" has not only been confused in cases with these other types, but it has been associated with many other types and fires for which these other types are responsible. We will take as an example the statement of Mr. E. O. Sachs, who had been given to understand that the fire at Sandringham was due to a fire of the "well type." No doubt this statement is based upon a report to this effect which we know has been widely circulated by reporters, but it is totally untrue. We are entitled to state, on the authority of the fact, that the fire at Sandringham was caused by a "Well Fire," but by a different type of fireplace. Had a "Well Fire" been fixed it would have caused the removal of the timber underneath the hearth. The fireplace, in this case, was

placed upon the hearth, therefore the beam underneath was overlooked.

That a great many fires are caused by the use of ordinary modern grates, and especially the more recent low types, and that a still greater number of fires are narrowly averted thereby, we have ample proof, for in a large number of cases, when removing these types of fire "Well Fires," charred timber has been found underneath the hearthstone. There is no doubt that there are many modern grates which are unfortunately called "Well Fires," but which have no claim whatever to this title, to which the remarks of Mr. Max Clarke and Mr. Louis Jacobs will apply, but as these are fixed upon the hearth, and the "Well Fire" is partly sunk, and necessitates an examination of the space underneath the hearth, it should, if fixed according to printed instructions, be justly regarded as an actual preventative against fire rather than a source of danger.

We do not know whether the case mentioned by Mr. Louis Jacobs was connected with one of the various low types mentioned, or a genuine "Well Fire." A similar case, however, has come under our own observation, but it was found, on examination, that not only was the fireplace badly fixed, but the brickwork surrounding the fire was in a very bad condition. The fact that hundreds of "Well Fires" are fixed against a 9-in. wall without causing any similar trouble to the one named is a sufficient proof that the above case was an exception, and due to special causes.

For the Well Fire Company, Ltd.,

J. J. Fawcett,
General Manager.

SEWER VENTILATION AND INTERCEPTORS.

Sir,—Some little while since you printed in your paper a report which I submitted to the Works and General Purposes Committee of the Lewisham Borough Council. This report was approved by the Committee, and they recommended that it should be reported *in extenso* to the Council, and thus it became public. I now desire, in view of the fact that this report was not intended for publication, to amplify my views on the subject, and shall be obliged if you will publish this letter.

The benefit to sewer ventilation which must arise from the abolition of the interceptor I, I presume, admitted; it therefore only remains to show that there is no damage to the individual inhabitant by its omission. One of the most frequent objections which I have heard is, "Why should property owners ventilate the public sewers?" My answer to this is:—The public sewers are the property of the community at large, and if not ventilated by each individual house, some other system, probably a very expensive one, must be adopted, which will have to be paid for by each house.

The interceptor is designed to block off from the house drain the air from the sewers, on the supposition that the sewer air is more foul than the drain air—a proposition which I do not admit—the condition of things in sewers being in all ways more favourable to pure air than the state of affairs in a private drain. In a sewer there is a flow which is always proceeding, although the depth varies, consequently the solid matter is always covered with water and gives off less effluvia than in a drain, where, as a rule, there are three or four deposits always left between the water-closet and the sewer, as the 2-gallon flush is not sufficient to carry the solid matter by one discharge into the sewer, and, in most cases, it takes three or four discharges; this was conclusively proved by the Sanitary Institute in 1893 (Vol. XIV., p. 237) in a series of over 800 experiments carried out with channel pipes, so that actual observations could be taken. The results arrived at showed that with 4-in. pipes, 50 ft. in length, at a gradient of 1 in 30, a total of 59 per cent. of solid matter was left in the closet-trap, the drain and the interceptor, with a gradient of 1 in 40, the solid was 69 per cent., with a gradient of 1 in 75, 83 per cent. of the solid matter was not taken into the sewer. A further argument in favour of the superiority of sewer air to drain air is the frequent flushing and cleaning of sewers, whereas I have seldom heard of anyone who cleaned a drain unless it became stopped.

That the interceptor is a frequent cause of stopped drains is a matter beyond dispute to anyone who has had much experience in the maintenance of drains.

The fresh-air inlet, with a mica flap, is as often as not the foul-air outlet, as mica flaps are mostly out of order after they have been fixed six months.

A question has been asked, whether it is necessary to ventilate sewers; the answer appears so obvious that it seems a waste of

time to argue the matter. There are two reasons which ought to be sufficient:—Firstly, the air would become so foul that I am confident it would be taken up by the water on the sewer side of the traps and given off again on the house side of the traps; secondly, it would be impossible for men to work in sewers which were unventilated, and in this borough, both brick and pipe sewers are regularly cleaned.

EARLSEY VAN PUTTEN, A.M.I.C.E.
Borough Surveyor of Lewisham.

. We have no objection to giving Mr. van Putten's letter the publicity he desires, although we do not think that he has made out a strong case against the intercepting trap. We acknowledge that stoppages in drains are often caused by these traps, and that the abolition of the interceptors in private drains would greatly improve the ventilation of the public sewers, but it does not follow that the abolition of the interceptors would be, on the whole, beneficial.

We are inclined to think that Mr. van Putten attempts to prove too much; certainly he will have some difficulty in convincing any normal sanitarian that "the condition of things in sewers [is] in all ways more favourable to pure air than the state of affairs in a private drain." If the conditions in sewers are indeed so favourable to pure air, why this trouble about sewer ventilation? In support of his dictum, Mr. van Putten adduces some experiments recorded by a committee of the Sanitary Institute in 1893, and makes the definite statement that these "conclusively proved" that "in most cases it takes three or four discharges" of a 2-gallon flushing cistern to wash the deposits from a water-closet into a sewer. They *proved* nothing of the sort, as in each experiment the solid matter left in the closet-trap, the drain, and the interceptor after one discharge of the flushing cistern, was "removed before the next experiment." We may infer that, at the least, one additional flush would be required to remove the solid matter, but we may not take it for *proved* that a third or a fourth would be necessary. Mr. van Putten also takes a somewhat unfair advantage of his readers by mentioning only those experiments which appear to tell in favour of his opinion, and ignoring those which have a contrary tendency. The experiments were made for the purpose of ascertaining "the quantity of water required to flush a water-closet," but our correspondent quotes only the tests with a 2-gallon flush and 4-in. drains (the conditions, we admit, usually, but not invariably, obtaining in practice), and even in these cases does not give the proportions of solid matter left in the closet-trap, drain, and interceptor respectively. With a 2-gallon flush the proportions left in the drain itself were 11, 27, and 26 per cent. for the three gradients of 1 in 30, 1 in 40, and 1 in 75. With a 2½-gallon flush, the proportions were only 2, 8, and 8 per cent., and with a 3-gallon flush, 0, 1, and 3 per cent. The experiments with 6-in. drains of the same length, and with shorter 4-in. and 6-in. drains were still less favourable to Mr. van Putten's contention. The obvious conclusion is that the 2-gallon flush was insufficient, and that when a larger flush was used and the drains were laid with sufficient fall, the deposit in the pipes was very small indeed.

It must not be forgotten that, in actual practice, two flushes are often given after each usage of a closet, and that the discharges from other sanitary fittings, especially baths, are useful in keeping drains free from permanent deposits.

But even if it be admitted that the air in drains is not always as pure as it might be, we do not see why this should be adduced as an argument in favour of using them as conduits for what we believe to be the still fouler air of sewers. We should say that the wiser course would be to rectify the defects, and so render the air as pure as the circumstances will allow.

It is incorrect to say that in a sewer "the solid matter is always covered with water." Does the writer of the statement forget that there are such things as branch sewers with dead ends, and that near these dead ends the sewers may receive the discharges from one drain only? And if deposits occur in a 4-in. drain with a gradient of 1 in 40, will they not also occur in a 9-in. or 12-in. sewer laid to a much lower gradient, and receiving the discharges from one, or even two, drains only? Again, it is well known that many sewers are very far from satisfactory, and it is unfair to call upon private owners of property to abate the nuisances created by the public authority. The fact is that many sewers are so foul that some of the ventilators at the street level have proved such intolerable nuisances that the public authorities have had to close them, and the public


officials appear to be at their wits' end to devise a simple and economical, as well as inoffensive, method of getting rid of the foul emanations so pervasively produced under conditions "in all ways more favourable to pure air than the state of affairs in a private drain."

We believe that it would be a grave error and also an injustice to abolish intercepting traps, and thereby convert existing soil pipes into sewer-ventilators. The result would be that the only protection against the entrance of sewer-air into buildings would be the traps of water-closets, and if these were unsealed in any way (whether by siphonage, fracture, or removal for renewal and repairs), the sewers would be ventilated directly into the buildings. The ventilating shafts for public sewers ought to be entirely separate from private drains and sanitary fittings; the objections to the fixing of such shafts against the walls of buildings would be much less serious than those raised to the utilisation of existing soil pipes as sewer-ventilators.—Ed.

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE-STEEL.—VI.

A ONE-STORY FACTORY BUILDING.

 HIS week we consider a building of an entirely different type from that forming the subject of the three preceding articles. The structure, which is typical of the Wight-Easton-Townsend system of reinforced concrete, is 312 ft. long, with a minimum width of 52 ft. and a maximum width of 112 ft. Beneath one of the workshops, measuring 142 ft. long by 65 ft. wide, a basement has been constructed, a portion of which is shown in section by Fig. 36. The roof of the entire building consists of a concrete-steel slab with girders of the same material, and over a portion of it are situated three tanks for the storage of water (see Fig. 34).

The building was erected on a part of Long Island City, New York, where the ground is of alluvial character, being in fact little better than mud. Consequently, pile foundations were absolutely necessary, the piles being driven in groups, upon each of which a mass concrete footing was formed, and upon the footing a concrete pier, as represented in Fig. 36. The footings were spaced 16 ft. apart, longitudinally on lines corresponding with those of the outer walls, and in one portion of the building additional footings were made to afford a longitudinal row of supports for interior columns. The lateral spacing of the footings varied from 33 ft. to 52 ft. in different parts of the building.

In the basement mentioned above, the floor consists of a bed of simple concrete 6 in. thick, deposited on rammed and levelled earth. The columns, rising from the tops of the concrete piers, support the main floor and the roof of the building. The exterior columns are incorporated with the walls, forming pilasters either on the outside, as in Fig. 36, or on the inside, as in Fig. 35, while the interior columns serve as intermediate supports for the girders.

The exterior columns have a section of 16 in. by 12 in., and are reinforced by four vertical bars, with $\frac{3}{4}$ -in. diam. horizontal ties at intervals of 12 in. measured vertically. In Fig. 36 the vertical reinforcement is composed of $\frac{3}{4}$ -in. diam. bars, and in Fig. 35 of 1-in. diam. bars. In some of the columns it was necessary to employ $1\frac{1}{2}$ -in. diam. bars as vertical reinforcement. All the concrete used in column construction was mixed in the proportions of 1 part Portland cement, 2 parts sand, and 4 parts broken stone.

A section of the exterior wall at the basement will be found in Fig. 36, from which it may be seen that, commencing at the top level of the concrete piers, the design is that of a curtain wall. To insure adequate support between the piers, the wall is provided with reinforcement consisting of four steel bars, two straight and two bent (see Fig. 36), and of thirty-nine vertical stirrups for resisting shear. This reinforcement really converts the lower part of the wall into a strong beam. At the level of the main floor the floor slabs are carried by girders formed in the thickness of the wall, the reinforcement being similar to that employed in the case of the walls at the basement.

Apart from the columns and girders incorporated in them, the walls are reinforced through-

out with sheets of steel netting placed near the inner surface, the edges of the sheets being bent back to U-shaped section at the various window openings. This netting has strands of No. 9 gauge wire with 6 in. by 4 in. meshes, secured at the intersections by pieces of No. 9 gauge wire. Sheets of the same material, also bent to U-shape, are embedded below the window sills, and immediately under the roof slab the wall, for a depth of 11 in., is converted into a girder by the addition of longitudinal and vertical reinforcement generally similar to that at the lower levels. The details in question are clearly shown in Fig. 36.

The walls are 6 in. thick, and the concrete was mixed in the proportions of 1 part Portland cement, 2 parts sand, and 5 parts cinders.

That portion of the floor which is above the basement consists of a continuous concrete-steel slab 7 in. thick, the reinforcement being applied in the form of two sheets of steel netting, one sheet perfectly horizontal and the other bent up towards the lines of support. The edges of the sheets are folded at right angles to afford satisfactory anchorage. A part of the floor slab is shown in the section A—A, Fig. 36. The weight of the main floor is carried entirely by the columns and girders, the latter term including the girders formed in the substance of the outer walls.

One of the most interesting features in this building is to be found in the roof construction. The upper surface of the slab has a slope of about 1 in 48, and the slab is divided into panels approximately 16 ft. square by the transverse and longitudinal girders. Over some of the workshops the slab is 4 in. thick, but generally the thickness is 6 in. Reinforcement is provided by two sheets of steel netting, as in the case of the main floor slab.

The transverse girders vary in dimensions and span at different parts of the building. Over one room their dimensions are 10 in. wide by 24 in. deep, over the boiler room the dimensions are 12 in. wide by 24 in. deep (see Fig. 34), while elsewhere they are 15 in. wide by 30 in. deep. The last mentioned dimensions apply to the girders illustrated in Figs. 33 and 35, these having the exceptionally long span of 52 ft. centre to centre, or 50 ft. 2 in. clear span between supports. The longitudinal girders, practically floor joists, measure 6 in. wide by 12 in. deep in some cases and 8 in. wide by 12 in. deep in others.

The panels over the boiler room are covered by concrete-steel water tanks, particulars of which are shown in Fig. 34. It will be observed that the tank at the left side of the figure is about 14 ft. wide by 12 ft. deep, inside measurement. The walls of the tank are formed by vertical slabs of reinforced concrete, with stanchions at intervals, generally similar in design to the joists used in the floors.

Owing to the weight of the tanks and of the water contained therein, the stress in the compressive areas of the girders was found by calculation to be greater than the compressive resistance of the concrete. Hence it became necessary to add horizontal reinforcing bars along the upper flanges. Similarly, owing to the high stress in the tensile areas, it was requisite to increase the amount of reinforcement in tension. By reference to the two sections in Fig. 34, it will be observed that nine $1\frac{1}{2}$ -in. bars are used in the tension areas of each type of beam, and that eight bars of equal diameter are employed in the compression area of one beam and six in the corresponding area of the other.

Adverting to the main roof girders, we may say that, although the clear span is not the longest on record, it is very nearly so. Therefore, it is satisfactory to be able to state that the members proved to be of ample strength and rigidity. As may be seen on reference to Figs. 33 and 35, they are reinforced by six $1\frac{1}{2}$ -in. diam. horizontal bars in the compression area, three horizontal $1\frac{1}{2}$ -in. diam. bars in the tension area, $1\frac{1}{2}$ in. above the bottom surface of the concrete, and two sets of three bent bars of $1\frac{1}{2}$ in. diam. The upper and lower horizontal bars are connected by vertical bars $\frac{3}{4}$ in. diam., the ends being turned over the horizontals. The vertical bars are wired to the bent longitudinal bars, and the whole reinforcement formed a rigid framework before it was placed into the mould. The vertical bars for resisting shearing stresses are spaced apart at distances increasing from 44 in. at the supports to 18 in. at the centre of the beam. The section A—A in Fig. 35 gives details of the reinforcement in the longitudinal beam shown

in the upper drawing. In Fig. 33 may be seen particulars of a wall bracket suitable for the attachment of a pedestal for shafting. The formation of brackets in this way saves backing the walls about, and affords a far better connection than would be given by the usual bolt and nuts. Although this bracket may seem insignificant detail, it is sufficient to suggest the great adaptability of concrete-steel architectural and other requirements.

From the foregoing particulars a general idea may be obtained of the main features of the construction exemplified in this building. We may point out, however, that the design of the walls and floor slabs is of distinctive character, and that exceptional provision has been made for withstanding shearing stresses in all the members subject to flexure, as well as for obviating voids in the concrete and other defects due to carelessness or want of skill on the part of the workmen. The mechanical principles taken into account by the designers are those discussed in our previous series of articles, and in applying them the following were the data used:— Ultimate compressive strength: cinder concrete = 36,000 lb. per sq. in., stone concrete = 52,000 lb. per sq. in., factor of safety = 4; steel = 80,000 lb. per sq. in., factor of safety = 4. Ultimate tensile strength: concrete = steel = 80,000 lb. per sq. in., factor of safety = 4. Adhesion between concrete and steel = 80,000 lb. for a bar having a length twenty-six times its diameter.

The moulds employed during construction were of very simple design, as may be seen by inspection of Figs. 37, 38, and 39. Part of an interior column mould is illustrated in Fig. 39. The boards forming the three flat sides were carefully planned and secured by vertical battens, and the boards finally substituting the fourth side were nailed on, not after the other as the concrete was deposited, until the work reached the top of the mould. The first stage in the making of a column is to put the vertical reinforcement in place, with the horizontal ties at the top, as shown in Fig. 39. Two of the front boards were nailed on, concrete was shovelled in to the depth of 12 in., and one transverse tie slid down so as to rest upon the surface of the concrete. The same series of operations was repeated until the work reached the top of the mould.

Part of a wall mould is shown in Fig. 38. The sides were formed of 1-in. boards, planed on face and edge, clamped together by horizontal battens, and kept at the proper distance apart by short pieces of board nailed up to the top at suitable intervals. The drawing represents the mould ready for continuing a part of a wall already commenced. In building the first course of the wall the mould was set upon the ground, which was rammed and carefully levelled, and the mould was held in position by means of struts on either side. Three days were allowed for the concrete to set, the sides of the mould were then loosened, and the mould raised to the position indicated in Fig. 37, where it was held by inserting and tightening the bolts. The sleeves through which the bolts passed were simply of cast-iron board, this being quite sufficient to prevent the concrete from adhering to the metal, and so obviating any difficulty in the way of removing the bolts.

The wall moulds were made in sections, 16 ft. long by 3 ft. high, fitting between the wall columns.

Fig. 38 shows part of a girder mould and the boarding for the floor slab. The boards of the mould consisted of a board or planks from 1 in. to 3 in. thick, according to circumstances, and attached to the sides by sleeves passing through longitudinal fillets, as shown in the sketch. The sides were formed of vertical boards 4 in. wide by $\frac{3}{4}$ in. thick, nailed to top and bottom longitudinal fillets 4 in. wide by 2 in. thick, and also by a third fillet provided for supporting the 4-in. by 6-in. timbers for carrying the floor slab falsework. For the support of the girder moulds, 6 in. by 8 in. struts were wedged beneath short pieces of board acting as caps, as shown in the figure. The board acting as caps and floor slab had been formed and allowed to harden for about seven days, the floor centring was struck by a crane, the 4-in. by 6-in. timbers on top of the centring permitting the floor boards to follow.

Another week the sides of the girder mould were removed, and the girders remained in place, the bottom board in place for a further period of three weeks, on the expiration of which the wedges between the struts and the cap board

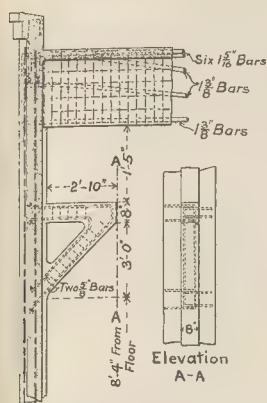


FIG. 33.

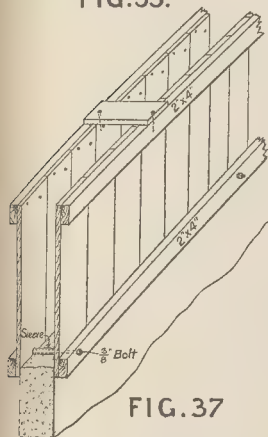


FIG. 37

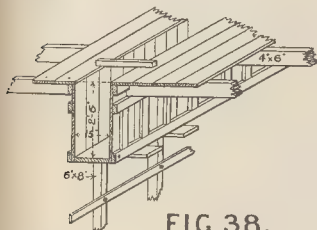


FIG. 38.

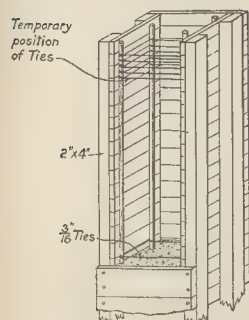


FIG. 39.

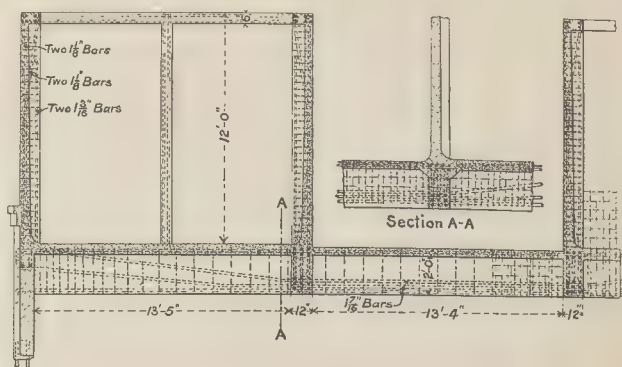


FIG. 34.

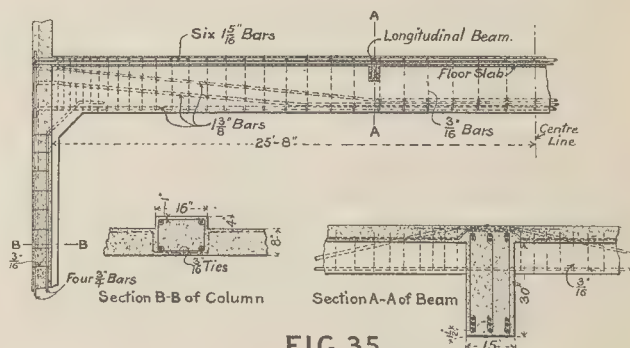


FIG. 35.

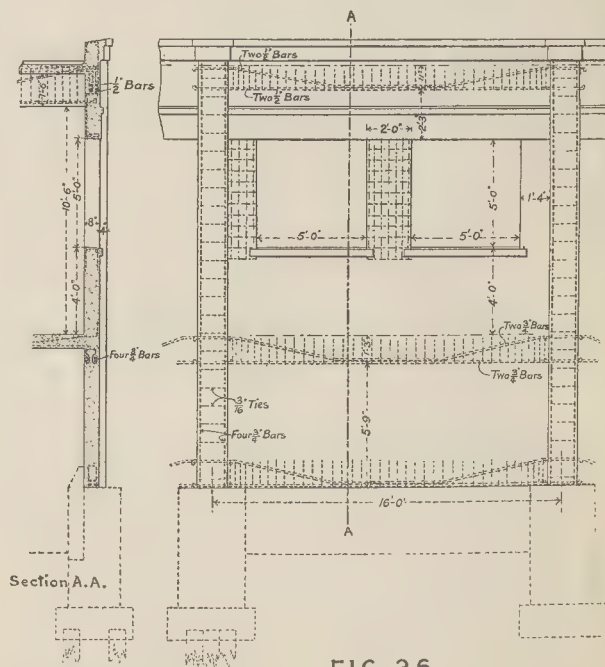


FIG. 36.

Illustrations to Student's Column.

were knocked away, and the girders were left for another week with the struts in position and ready to afford support in case of failure. The advantages claimed for this method of hardening are that the free access of air facilitates the setting of the concrete, and at the same time offers safeguards in the event of collapse through unsuspected defects of any kind.

One point to which special attention may be drawn is that the reinforcement of the various members was wired and otherwise fixed in the moulds, so that displacement of the bars became practically impossible, or at all events extremely unlikely. Considerable care was taken with the view of insuring a good bond between new and old work. Generally, it was found that an interval of about twelve hours did not interfere with satisfactory union, but in cases when a longer stoppage of work became necessary, the existing surface was well washed and covered with a thin layer of mortar before the resumption of concreting. All junctions were strengthened by the insertion of steel netting of the kind already described.

With the object of verifying the correctness of the calculations, three test beams were made by the engineers, these beams having a clear span of 20 ft. The general result of the trials was that each beam showed cracks at the lower surface of the concrete when the load was approximately equal to the calculated amount.

COURT OF COMMON COUNCIL.

THE usual fortnightly meeting of the Court of Common Council was held at the Guildhall on Thursday last week.

Duke's Head passage.—Among the documents for the City Seal was an agreement made between the Corporation and the Ecclesiastical Commissioners, whereby the former body agreed to pay the latter a sum of 500l. for the removal of the archways with the rooms thereover at the east and west end of Duke's Head passage.

St. Bartholomew's Hospital.—On the recommendation of the Streets Committee, it was agreed to sanction the carrying out of certain works in connexion with the erection of the new out-patients' department at this hospital. It was resolved also to relay a portion of the carriage-way of Finsbury-circus with macadam, at an estimated cost of 450l.

Tramways on the Embankment.—The Streets Committee submitted a report on this matter, and recommended that the Corporation should not consent to the proposed tramways within the City.

Mr. J. A. C. Morrison, in moving the report, said that while it was to the interests of the City to get people into the City quickly, he was afraid that the proposed scheme could not be carried out without greatly interfering with the traffic. Mr. Wm. Cooper moved as an amendment that the report be referred back, and further consideration of the whole matter adjourned until the report of the Royal Commission on London Traffic is published. He considered that the Corporation were not called upon at the present time to say yes or nay; they ought to wait until the whole matter was before them. This was seconded by Deputy Parnell. Several other amendments were moved, but, after a long discussion, the Committee's recommendation was finally agreed to.

London Building Acts Amendment Bill.—The following motion by Mr. Deputy Parnell was agreed to:—"That the London Building Acts Amendment Bill be referred to a special committee consisting of the nine members (appointed by the three committees to whom the Bill has been referred), with power to retain counsel, obtain evidence, and take such other steps as may be deemed advisable, reporting thereon from time to time to this Court as may be necessary, and that the resolution of the Court of January 12 last be varied accordingly, and, further, that all references appertaining to the matter be transferred to the said special committee."

MISSION BUILDINGS, ISLINGTON.—Messrs. Patman & Fotheringham ask us to mention that they were the contractors for this building, briefly mentioned in our last issue.

MEMORIAL BUXT, NEWCASTLE-ON-TYNE.—It was decided, on the 7th inst., by the Laing Presentation Committee, under the presidency of Alderman Newton, to appoint Mr. C. Neuper, of Newcastle, the sculptor of a marble head of Mr. Alexander Laing, to be placed in the new Art Gallery, to commemorate the generosity of that gentleman in giving the building to the city. The bust is to be of life-size, 2½ ft. in height.

OBITUARY.

M. ERNEST BARRIAS.—French art has lost a great sculptor by the death, last Saturday, of M. Ernest Barrias, at the age of 63. Born at Paris in 1841, Louis Ernest Barrias studied under Léon Cogniet, Joffroy, and Cavalier. In 1860 he obtained the Second Prix de Rome for his "Chryseis," and in 1865 the Grand Prix in sculpture for his "La Fondation de Marseille." His first work sent from Rome, "Jeune Fille de Mégare," was likely to take in contemporary art. His last work sent from the Villa Medici, "Le Serment de Spartacus," is in the garden of the Tuileries. The annual Salons were so many triumphs for him, the greatest being in 1873, with his group of the "Premières Faneurales," now in the Petit Palais. Among his best known and most important works are the "Défense de Paris," which decorates the rond-point at Courbevoie; the "Défense de St. Quentin," and the fine monument to Victor Hugo erected at Paris two years ago. Then there are the works executed for the Hôtel de Ville at Paris; the "Bernard Falguière" at Boulogne-sur-mer; the monument to Emile Augier, and "La Nature découvrant ses Secrets," now in the Luxembourg museum. Besides his great genius for composition, Barrias rejoiced in an exceedingly keen sight, which contributed to give him great power as a portrait sculptor. He was the author of many portrait busts of the highest order, notably those of Jules Favre, of Marmontel, of Couture, and of his brother M. Felix Barrias, who, though much his senior, survives him. Barrias was a great artist, and his death is lamented in the world of French art by all who knew either the sculptor or his works.

Mr. JOHN LEANING.—We greatly regret to record the death of Mr. John Leaning, which took place on Sunday last from heart failure resulting from an operation for appendicitis on the previous Friday. Mr. Leaning was born at Colchester in 1840, was educated there, and afterwards emigrated to Australia, where he was engaged in the occupation of the Surveyor of the Crown Lands at Melbourne. He returned to England in 1868, and devoted himself to quantity surveying, and in 1880 published his well-known work on that subject. That work has had a wide circulation, and is now in its fourth edition. Other works by him are:—"Conduct of Building Work" (1885), and "Building Specifications" (1901). He has been engaged upon many important public works for the London County Council, and recently for the Admiralty and other public bodies. He was an examiner at the City of London College and one of the original lecturers at the Architectural Association. He joined the Surveyors' Institution in 1888. In later years he acted in many building arbitration cases, both as expert witness and arbitrator. By his unflinching faithfulness to his duty, his integrity, and his untiring energy he won the respect and goodwill of all with whom he was concerned. He had recently written a paper for the Surveyors' Institution on "Uniformity of Practice in Quantity Surveying," which was to have been read this session.

MR. ASTON.—The death, on January 29, at Limefield, Bollington, is announced of Mr. Walter Aston, of King-street, Manchester, in his 44th year. Mr. Aston was elected a Fellow of the Royal Institute of British Architects in January, 1901; he was a Fellow of the Manchester Society of Architects and a member of the Lancashire and Cheshire Antiquarian Society. Mr. Aston was the architect of the "Pence" almshouses and the "Old Shoppe" at Macclesfield, and of the Wesleyan day and Sunday schools in Old Chapel-lane, Rainow, Cheshire. We gather that he acted as assistant to Mr. James Stevens, of Macclesfield, in the restoration, 1882-92, of the parish church of St. Michael in that town.

BUILDING BY-LAWS (RURAL).—On the 23rd inst. Mr. Walter Long, President of the Local Government Board, will receive a deputation of members of the National Workmen's Housing Association, and of some rural district councils, who will submit their views in favour of building by-laws that shall be based upon the following principles:—

- (a) By-laws are absolutely necessary, and their enforcement is a duty.
- (b) They should contain nothing that hinders the construction of good cottages.
- (c) In any modification with respect of material, health, safety, and stability must be safeguarded.
- (d) In any modification as to the mode of building, recent calamities, due mainly to the use of unsuitable materials, must be considered.
- (e) A proper definition of a room is desirable.

The secretary of the Housing Association is Mr. Williams, of No. 10, Clifford's-inn.

GENERAL BUILDING NEWS.

BAPTIST CHURCH, NEWCASTLE-UNDER-LYME.—A Baptist church and schools, etc., are about to be erected at Newcastle-under-Lyme. The schoolroom or assembly hall will be placed under the church, this being necessary owing to the narrowness of the site. It is proposed to use red terra-cotta for the elevations, and grey for the interior. The figurework and enrichment will be modelled by Mr. Watson, of the Birmingham School of Art. The buildings will be heated on the low-pressure system. Fireproof floors and materials will be used wherever possible. Mr. E. Stanley Milton, of Birmingham, is the architect.

WESLEYAN CHURCH, BENTON.—The Wesleyans at Benton formally opened their new church lecture hall on the 1st inst. When the buildings are completed they will embrace a chapel to seat 500, a lecture hall with seating accommodation for 250, with large classrooms, vestries, etc. Messrs. Marshall & Tweedy, Newcastle, are the architects for the buildings.

WESLEYAN CHURCH AND SCHOOLS, NORTHAMPTON.—The new church and school buildings, which have been erected in connexion with the Regent-square Wesleyan Methodist Church, Northampton, were recently opened. The architects were Messrs. H. H. Dyer, Son, & Winterburn. On the ground floor there is a parlour, a young men's room, and classroom, all leading out of an entrance hall. On the first floor there is a lecture hall with platform, and a class or retiring-room. The necessary equipment for the lecture hall is provided in the basement. A lift runs from the basement to the classroom adjoining the lecture hall. The building is heated throughout with hot water on the low-pressure system. The builder was Mr. H. Higgs, who secured the contract at £,510l. The hot-water apparatus was erected by Mr. Marriott, of Higham, Faversham. The electric light was installed by Mr. Mansell, and the decorations were carried out by Mr. Hanwell. It is estimated that the whole scheme will cost 2,200l.

WESLEYAN SCHOOLS, LEEDS.—The new Sunday schools in connexion with the Burley Wesleyan Church, Leeds, were opened on Saturday last. The new schools, which adjoin the church, and have a frontage on to Burley Park, comprise a schoolroom, infants' room, and nine classrooms. The building is 63 ft. long and 31 ft. wide, and is lighted at the front by two traceried windows, on the sides by six more traceried windows, and over the platform by a large circular window. On one side of the main room are four of the classrooms, which, by means of folding partitions, can be opened out into the schoolroom. Communication with the church is made by way of corridors, two stone staircases being arranged for the scholars to have direct access to the gallery. The heating is on the low-pressure hot-water system, and the lighting is by electricity. A detachable staircase is provided for the caretaker. The building, like the church, is of stone in the Decorated style, from the designs of Messrs. Danby & Simpson, architects. The principal contractors were Messrs. Ledgard & Son and Mr. Walter Colley.

WESLEYAN SCHOOL HALL, ROUNDHAY, NEAR LEEDS.—The new Wesleyan school hall, which has been erected in Lidgett Park-road, Roundhay, was opened a short time ago. The building has an open timber roof, and will accommodate about 150 persons. It consists of a school hall, with two classrooms and lavatories, etc., on the ground floor, and a kitchen and storerooms in the basement. The hall is separated from one classroom by a sliding shutter, which can be removed to increase accommodation at meetings and services. A lift connects the kitchen with the hall. The building has been constructed of local stone, in the Early English style. Mr. W. H. Bevers, of Leeds, is the architect. The portion of the scheme already carried out has cost about 2,600l.

Y.M.C.A. BUILDINGS, MORPETH.—New premises for the Young Men's Christian Association have been opened at the corner of Market-place and Oldgate, Morpeth. The architect for the work was Mr. J. W. Taylor, Newcastle, and the contractor Mr. Jackson, of Rowland's Gill and Newcastle.

ALTERATIONS TO THE CENTRAL FREE LIBRARY, BRADFORD.—Alterations are now being carried out at the Bradford Central Free Library, incidental to the removal of the art collections to the Cartwright Memorial Hall. The plans have been prepared by the City Architect, Mr. F. E. P. Edwards, in consultation with the City Librarian, Mr. H. Butler Wood. In the conversion of the Art Gallery into a library, nine windows, which have been blocked up, are to be opened out. The present galleries will be divided by three glazed partitions.

The first of these apartments will provide a magazine-room, the second is to be used as a reference library, with a reading-room attached, and the third will be sub-divided into the reference library, and to provide a room for students. Shelving space in the area allotted to the reference library will be constructed, in nine book-stacks, to accommodate 51,000 volumes. The space in the reference library will be entirely rearranged. The present ladies' room will become a work-room for the staff, with bookshelves for about 10,000 volumes. The ladies' room will occupy the place of the present bookcases for the reference department. The present magazine-room will become the lending library. Beyond the counters, bookshelves will be provided for about 30,000 volumes, as compared with 25,000 volumes at present on the shelves. The removal of the lending library will enlarge the newsroom, which will then have tables for eighty-four persons, and a larger number of newspaper racks. There will be a complete system of mechanical ventilation, and the present heating arrangements are to be improved. The cost of the alterations will be over 2,200.

PRINCIPAL SCHOOL, LICHWINGNOCH.—This new school has just been opened. Four classrooms are provided on the ground floor and six on the upper floor, each with a stove. One is situated in the centre of the school, behind the front range of classrooms. Male and female teachers' rooms are provided on the ground floor, and assistant teachers' cloakrooms and lavatories on the upper floor. Cloakrooms and lavatories for the scholars are provided immediately inside the cloakrooms. One of the upper rooms is arranged suitable for cookery classes, and another can be adapted for drawing, while physical instruction can be taught in the hall. The whole school is heated by hot-water pipes and radiators from an independent boiler in the heating chamber, and fresh warm air is drawn from the boiler by means of inlets all round the building in connexion with the heating radiators. The vitiated air is extracted by means of ducts from the walls and ceilings connected to ventilators on the roof. The cost of the building will be about 10,000. The architect is Mr. C. Davidson, Paisley.

PRINCIPAL HEALTH LABORATORIES, MANCHESTER UNIVERSITY.—The new buildings are now completed, and will provide facilities for the study of all home diseases. They have been erected from plans prepared by Professor Capper and the Director and Secretary, Professor Delapine. On the ground floor are a large chemical laboratory, two bacteriological laboratories, one of which is fitted with five cubicles for advanced research work, two large rooms for general research and available for use by public authorities, rooms for dissection and photography, and an apartment reserved for clinical pathology, to be used by the staff of the Royal Infirmary, for which an adjoining site has lately been secured. On the first floor are the museum, Professor Delapine's offices and special laboratory, and the library, which already contains some 3,000 books relating to pathology and public health. The building stands near Owens College; they are constructed of brick.

BUSINESS PREMISES, DUNDEE.—Alterations and additions are now being carried out at the premises of Messrs. J. A. MacLean & Sons, in South Tay-street, Dundee. The work has been planned by Mr. James Sibbald, architect.

FREE LIBRARY, LITTLEHAMPTON.—The laying of the foundation-stone of the Littlehampton Free Library will take place shortly. The new building will stand on a site at the corner of Maltravers-street and Fitzalan-road. Mr. Walter Willis has secured the contract for the structure at 2,197, and has to complete within six months. Mr. H. Howard Surveyor to the Littlehampton Council, is the architect.

CARDIFF MUSEUM AND ART GALLERY.—A meeting of the Cardiff Museum and Free Libraries Building Committee was held on the 1st inst. for the purpose of considering the amended plans and specifications of the proposed new museum to be erected in Cathays Park, at an estimated cost of between 150,000 and 160,000. It was recommended to the committee that only the central block and the western wing, which the architect, Mr. Edwin Seward, estimates to cost 25,876, exclusive of architect's fees, bills of quantities, and the cost of the clerk of the works, should be proceeded with. The plan to be the central block and western wing were concerned, were approved and adopted, and it was decided that the work should be carried out at a cost not exceeding 25,000, the cost to include the architect's commission. Bills of quantities and the clerk of the works' salary. The first of the building to be built of Portland stone, to harmonise with the new town hall and law courts.

INEBRIATES' HOME, CATTAL.—The Yorkshire Inebriate Reformatory at Cattal, near York, which is to be opened in March, will have accommodation for about eighty patients—sixty women and twenty men—besides the arrangements necessary for the administrative staff. The building is so planned that it can be enlarged, if necessary, until ultimately accommodation is found for 250 patients. It has been designed by Mr. Victor Edwards, the West Riding architect, and the estimated cost is about 30,000.

MUNICIPAL BUILDINGS, SOUTH SHIELDS.—Within the next few months, the foundation-stone of the new municipal buildings at South Shields will be laid on the site situated at the corner of Ogle-terrace and Westcote-lane. The Town Council at their last meeting decided to advertise for tenders for the erection of the building from designs prepared by Mr. Ernest E. Fetch, architect, of London.

WOMEN'S HOSPITAL BUILDINGS, BIRMINGHAM.—New buildings are being erected for the Birmingham and Midland Hospital for Women. The Convalescent Home, which stands a short distance away from the main hospital, and upon the other side of Park-road, is quite finished, and has just been opened. The convalescent home is two stories, the lower part the facade being in red brick, and the upper in white stone. It will afford accommodation for twelve patients. It is planned with a centre portion and two wings. On the right of the entrance are the matron's sitting-room and the patients' day-room, measuring 22 ft. by 16½ ft.; also a dining-room, 20 ft. by 14 ft. At the left or east end are the kitchen, cloth room, and other accommodation. Upon the upper floor are two dormitories, each containing five beds, and one with two beds, bedrooms for the matron and servants, and linen store. An external iron staircase, for use in case of fire, is provided, in addition to the internal means of access.

The main hospital is in the Queen Anne style. The administrative block, a detached nurses' home, and a laundry, have their front to Showell Green-road. Behind the central entrance to the administrative buildings a corridor extends to the hospital, of which the principal apartments are four wards, upon the ground floor and two upstairs. Each of these will contain ten beds. The upper wards have open balconies on three sides. There are also four small wards, containing two beds each, two operating-rooms, and store and service accommodation. On the south side a small detached building will have two wards, one bed to each, for special cases. The upper wards are both furnished with external fire-escape staircases. The buildings have been designed by Messrs. Martin & Martin, and the contractor is Mr. C. Gray Hill, of Coventry.

SANITARY AND ENGINEERING NEWS.

WATER TOWER, NEW BRIGHTON.—The new reservoir and water tower at Gorse-hill, New Brighton, which have been erected for the purpose of supplying the high lying districts of New Brighton, are now complete. The work has been carried out from the designs of Mr. H. Crowther, Gas and Water Engineer to the Wallasey Urban District Council, by Mr. John Gourley, engineer and contractor, Liscard and Liverpool. The site selected for the reservoir was of a rocky nature, and 28,000 yds. of rock had to be excavated in order to provide the necessary space for the reservoir, which is 312 ft. in length, with an average width of 120 ft., and depth of 20 ft. 6 in., giving a capacity of four and a quarter million gallons. The reservoir is lined throughout with bitumen sheeting. The tower, which is octagonal in shape, with a platform on top, is built of red Runcorn stone, partly faced with brickwork inside. The tank, which is placed about 60 ft. above the roadway, has a capacity of upwards of 70,000 gallons, and is supplied by a 21-in. pipe leading from the Vyrnwy supply, and also with an 18-in. pipe from the pumping station at Liscard, both of which can be run direct into the tank if required.

RAILWAY EXTENSIONS, LIVERPOOL.—The work in connexion with the widening of the line between Kirkdale and Walton Junction, on the Lancashire and Yorkshire Railway, has been completed. The old tunnel, which commenced at Kirkdale Station and continued to within a short distance of Walton Junction, was 1,149 yds. in length, and two lines which were used by both fast and slow trains met the requirements of the railway company up to a year or two ago, when, in consequence of the congested state of the traffic, it was deemed advisable to make some alterations in the system. The execution of the contract commenced at Kirkdale Station, over two miles from Liverpool, the termination being at Walton Junction Station, over three miles from Liverpool. The tunnel has been shortened at each end by about 160 yds., and opened out in the centre for a length of 111 yds. Alongside the old tunnel new tunnels have been constructed for two lines of way, of a similar length to the old tunnel as altered, and the line has been doubled so as to provide four lines of way between Walton Junction and Sandhills. Alterations have been effected at Kirkdale railway station. Covered entrances and staircases to the two platforms have been erected, and the middle platform has been lengthened. The contractors for the main portion of the work are Messrs. J. D. Nowell & Sons, Victoria-street, Westminster, and the whole of the work has been designed and carried out under the direction and supervision of Mr. W. B. Worthington, Chief Engineer to the Company, and his resident engineer in Liverpool, Mr. M. Glen Ross.

SEWAGE SCHEME, TOTNES.—At Totnes on the 2nd inst. Mr. H. Ross Hooper, Local Government Board Inspector, held an inquiry relative to an application of the Corporation for leave to borrow 6,800, to complete the sewage scheme. The Town Clerk (Mr. E. Windeat) said the sewage was taken down a tidal river, and as there was no manufacture in the town the scheme was purely for sewage. With reference to the outfall works, the Council was prepared to erect tanks and filters, but objected to 494, for irrigating the land at the outfall works. The Council contended that the septic system was not required, the river being quite sufficient, as there were two tides each day. There were also heavy floods in the summer. Out of 650 inhabited houses in the borough 494 would not be connected in the system. Mr. Ware, C.E.S., also gave evidence, and the inquiry closed.

FOREIGN.

FRANCE.—Mlle. Dufau and M. Ernest Laurent have been commissioned to execute the Salon "Des Autorités" at the Sorbonne, eight decorative panels. Two large wall-paintings have also been commissioned from M. Henri Martin, to decorate the gallery which runs round the principal courtyard. M. Aman-Jean has been commissioned to paint a large composition for the amphitheatre of Physiology, and M. Dewambez is to execute, in the Council-room of the University, a painting of a modern subject. M. René Ménard has received a commission for a frieze for the Ecole des Hautes Etudes. M. Roos has been commissioned to paint an allegorical picture for the Collège de France, and M. Le Bonche a panel for the Elysée, representing a "Fête de Fruit." M. Lucien Simon is to paint some figure and animal pictures for the veterinary school at Lyons. A committee has been formed to raise a monument to Daubigny at Anvers-sur-Oise. The Municipality of Fontainebleau has opened a competition for a new theatre. A competition has been opened at Auch for the building for a new Prefecture, to cost 700,000 francs. There is shortly also to be a competition for a new prefecture at Toulouse. M. Max Raphael, architect, of Nîmes, has been elected president for this year of the Société Départementale des Architectes du Gard. The discovery is announced at Rodon, of a Romanesque crypt of the XIIIth century, beneath a portion of the church. A committee has been formed at Anney to raise a monument to Eugène Sue.

GERMANY.—The new Catholic church at Königshütte in Upper Silesia, after plans by Professor Josef Schmotz, will be built in the form of a Basilica. The Exhibition of Arts and Crafts, to be held in the National Museum at Munich this year, promises to be unusually interesting and complete, as the exhibits sent by this town to the St. Louis Exhibition will be utilised. The new church at Breslau is to be built from the designs of MM. Gatz & Böttcher, at a cost of 550,000 marks. The new Orphanage at Godesberg, built in Romanesque style by the architect Herr Friedrich Schulte, was opened last October. The hospital at Munich, built by the MM. Heilmann & Littmann, under the direction of the architect Herr Stempel, is now in use. The Gymnasium at Zehlendorf, near Berlin, a building in German Renaissance style from the designs of Herr Franz Thyriot, is completed. The Town Hall at Ratisbon, a very ancient and interesting building, is being restored; a committee has been formed to superintend the work, consisting of antiquaries, architects, and members of the Town Council. The Town Hall of Friedrichshafen is to be rebuilt from the designs of MM. Eisenlohr & Weigl.

SWITZERLAND.—Professor Hans Bachmann, of Lucerne, has nearly completed two large pictures representing the "Death of Gessler," and the "Death of Wilhelm Tell," the paintings are to be placed in the "Tell" chapel at Küsnacht, which has lately been restored.

The tower of the church at Hausen is to be rebuilt, and the church itself restored, under the direction of the architect Herr R. Kuder, of Zurich.—The Town Council of Lausanne, in order to meet the overcrowding of the schools, has decided to erect two portable school pavilions.

AUSTRIA.—The theatre at Bielitz is to be rebuilt from plans by MM. Fellner & Helmer, at a cost of 100,000 kr.—A new church is to be built at Mähr-Ostau, from plans by MM. Troll & Feigl.

PUBLIC WORKS IN VIENNA.—It is stated that the Municipality of Vienna will shortly invite tenders for the execution of several important works, viz.:—Extension of the tramway system, estimated cost about 256,000l.; establishment of a second water system, 120,000l.; construction of bridges, 250,000l.; paving works, 112,000l.; construction of a market, 17,000l.; provision of a central abattoir, 20,000l.; erection of a museum, 2,000l.; works at the central cemetery, 64,000l.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. Marchant & Co., the present owners of the County Gallery, in Regent-street, have opened additional premises at 2, Haymarket.

—The practice of the late Mr. John Leaning will be carried on by his two sons, Messrs. Henry & William Leaning, who since 1900 had been in partnership with their father under the name of "John Leaning & Sons." The name of the firm will be retained unaltered.

GRAMMAR SCHOOL, FARNHAM.—The governors have appointed Messrs. Jarvis & Richards, of London, as architects of the new buildings. The school was originally established at Farnham, in the county of Surrey, in a remote period, and was refounded, and endowed in 1611 by Dr. J. Harding, President of Magdalen College, Oxford. The school was re-established about sixty years ago; in 1872 new schoolrooms, with a dormitory, were built in West-street, and the premises were enlarged twenty years afterwards.

THE QUESTION OF INTERCEPTING TRAPS.—At the meeting of Lambeth Borough Council, on Thursday of last week, the following report by the Medical Officer of Health (Dr. Priestley) was submitted:—

"I have carefully considered the letter of the Town Clerk of Lewisham, dated December 2, 1904, together with the copy of the report of the Lewisham surveyor (Mr. Ernest van Putten), dated November 4, 1904, and am of opinion that the suggestion made therein for the removal of all intercepting traps, and the repeal of the London County Council Drainage by-laws, with reference to the compulsory provision of such traps, is one that is fraught with considerable danger to health, and should consequently be opposed at all costs."

The Borough Engineer (Mr. H. C. J. Edwards) reported stating that, in his opinion, until a more satisfactory arrangement was devised, it was scarcely practicable to do away with the intercepting trap. The following motion was adopted:—"That the Borough Council do not co-operate with the Lewisham Borough Council in approaching the London County Council with the object of obtaining the repeal of the London County Council by-law which requires the provision of a suitable and efficient intercepting trap to every main drain, or other drain, of a new building; and that the Lewisham Borough Council be so informed."—Deputy Borough Council has concurred in the opinions expressed in the letter of the Lewisham Borough Council, and will co-operate in approaching the London County Council on the matter.—Shoreditch Borough Council has merely "received" the portion of the Lewisham Council's letter relating to surface ventilators. The Shoreditch authority will co-operate, however, in approaching the London County Council to have the by-law dealing with interceptors repealed.

—Paddington Borough Council has decided to take no action on the letter of the Lewisham Borough Council with reference to the ventilation of sewers.

DISCOVERY OF A ROMAN KILN.—A discovery of great interest to antiquaries has been made at Worcester under part of the ancient half-timbered premises known as King Charles's House. Mr. A. E. Woodward was causing improvements to be made in the cellars when the displacement of some bricks led to the discovery of a Roman kiln in a perfect state of preservation. It is constructed entirely of 2-in. tiles and cement, and exhibits no sign of having been used. It is just within the city wall, which dates back to the time of the Commonwealth, but the front of the house appears to be built upon a wall of Roman character, constructed of 2½-in. tiles and 2½-in. bricks, laid alternately. Pieces of plastic fresco have also been found in the cellars.—*Times.*

CLOISONNE MOSAIC.—We mentioned some

time ago a new system which the Arrolithic Company had introduced of setting mosaic between brass cloisons dividing up the principal sections of the design. One object of this was to simplify repairs by confining the disturbance of the cubes within a limited area. We have just seen a specimen of floor-work carried out on this system, in an elaborate design of mediæval character, in which the thin lines of the brass cloisons form an element in the design, somewhat as the leading does in a glass window, only that of course the cloisons are narrower in proportion than the leadwork.

WAR MEMORIAL, WINDSOR.—His Majesty King Edward recently visited the Church of Holy Trinity, Windsor, for the purpose of unveiling a memorial to the members of the Household Brigade who fell in the South African war. The memorial consists of a series of zinc panels framed in oak. The panels—eighty-five in number—extend along the entire length of the north and south walls of the church underneath the galleries, and upon them are inscribed the names of 742 officers and men who, in the words of the first and dedicatory tablet, "Died for the Empire in South Africa." The designer was Mr. T. C. Barfield, secretary of the Institute of Artists; the heraldic work—namely, the panels on which the badges of the regiments and coats of arms and crests of deceased officers were painted—was executed by Mr. A. Cole, London; the lettering was the work of Messrs. J. & H. Ottroy, Windsor, and the sculptor, Mr. E. Hollis & Son, Windsor. The first and dedicatory panel was designed and also executed by Mr. A. Cole, and bears at each end a representation of the late Queen's South African war medal and King Edward's war medal.

STREET IMPROVEMENTS, BRIGHTON.—An inquiry was held at the Town Hall, Brighton, on the 2nd inst., by Lieut.-Colonel A. C. Smith, R.E., Local Government Board Inspector, with reference to the application of the Brighton Corporation for sanction to borrow 1,000l. for the purchase of property for the purpose of widening London-road and Viaduct-road. The Town Clerk (Mr. Hugo Talbot) explained that the proposed expenditure was in continuance of a scheme for the improvement of London-road which the Corporation had been carrying out for some years past. Mr. Weller, Assistant Surveyor, said the total area of the land proposed to be acquired was 165 sq. yds. The effect would be to increase the width of London-road to 68 ft. 6 in. in one part, and 69 ft. 9 in. at the junction with Viaduct-road. The Town Clerk and Mr. Weller afterwards explained to the inspector the plans of the workmen's dwellings which the Town Council have built in order for the purpose of accommodating people displaced by the widening of London-road.

CONFERENCE OF MASTER HOUSE PAINTERS AT DARLINGTON.—On the 24th ult. the second annual gathering of the Tees-side and District Federation of Master House Painters was held at the Technical College, Darlington. The retiring President (Mr. H. Macdonald) occupied the chair at the business meeting, when the following officers were elected for the ensuing year:—Mr. J. J. I. Smith, West Hartlepool, President; Mr. A. Jobling, Yarm, vice-president; Mr. S. L. Taylor, Middlesbrough, secretary; Mr. J. T. Burton, West Hartlepool, treasurer; Mr. Joseph Scott, Darlington, and Mr. Alton, Hartlepool, auditors. The treasurer's statement, showing a satisfactory balance in hand, was adopted, and Bishop Auckland and District Association were admitted as members of the Federation. In connection with the gathering an exhibition of apprentices' work was held in the new lecture-room of the college, and this was judged by Messrs. John H. Turner (Wakefield) and J. G. Cole (Newcastle). In their report they stated that they considered the work generally fairly good. In the evening the members dined together at the King's Head Hotel, Darlington, under the Presidency of Mr. J. H. McDermid, Mr. J. J. I. Smith being in the vice-chair. "The Tees-side Federation" was submitted by Mr. Bernard Biggs. In response, the President said that, as a federation, they were only a comparatively young body, and were not banded together to form a fighting machine, in any sense of the word. Their chief object was education. They wanted to improve the future of their trade. They wanted it to become something more than a trade; there was no reason why it should not become a profession. It might be asked upon whom did the obligation rest to teach the young men the trade. He thought most of them would agree that a great deal of the responsibility for the education of the apprentice rested upon his employer. Largely

bearing upon this was the co-operation of the trade federations with the technical schools. The work of one was the work of the other.—Mr. Pike Pease, M.P., proposed the toast of "Trade and Commerce," to which Mr. W. S. Reed (Sunderland) and Mr. Roberts (Crook) responded.—Mr. Jobling (Yarm) gave "The National Association of England and Wales," and Messrs. J. Brown (Newcastle) and Tetlow (Huddersfield) replied.—Mr. A. C. Coffin, B.A., submitted "The Institute of British Decorators," Mr. J. J. I. Smith responding.—Mr. J. Law gave "The Adjuncts," and Messrs. J. S. Cole and H. Turner responded.—Mr. J. H. Hill proposed "Our Visitors."—Mr. S. L. Taylor (Middlesbrough) submitted the toast of "The Local Committee of Arrangements," to which Mr. A. Armistead replied.

THE STONE TRADE.—The foreign demand for Festing slates is reported to be very good, and the output for 1904 was less than 1903. In Carnarvonshire trade is improving, and the reduction of about 14 per cent. in lists, as compared with January, 1904, enables the quarry owners to compete successfully with foreign slates in price, as they have always done in quality.

LONDON DISTRICT SURVEYORS' ASSOCIATION.—The District Surveyors' Association, which has just completed the sixtieth year of its existence, has been incorporated under a certificate from the Board of Trade. Mr. Alexander Payne, having filled the office of President for two years, has retired, and Mr. Thomas Henry Watson has been elected President. Mr. E. Drury, vice-president; Mr. Frederick Wallen, hon. treasurer; and Mr. Henry Lovegrove, hon. secretary. During the past year there has been one death and three resignations of districts.

MASTER HOUSE PAINTERS.—The Executive Council of the National Association of Master House Painters and Decorators of England and Wales held their quarterly meeting at the Bull Hotel, Wakefield, on the 6th inst. The President, Mr. H. Vigurs Harris, was in the chair. It was decided that the surplus of 500l. from the exhibition at Manchester last year should be disposed of by grants of 100l. each respectively to the Painting School at Manchester, and the investment of 250l. in Consols, in the names of Alderman Kendall, chairman of the finance committee, and Mr. J. H. Turner, hon. treasurer. The award by Sir Thomas Drew of the International Travelling Scholarship to Roland Barker, Leicester, has been accepted by the Association. The Executive Committee decided to hold their next meeting at Bristol in May.

BRISTOL MASTER BUILDERS' ASSOCIATION.—On the 7th inst. the annual dinner of the Bristol Master Builders' Association was held in the hall of the Royal Hotel, the chair being taken by Mr. E. I. Neale, President of the Association. The Lord Mayor, having been honoured, the President said that it had been their painful duty that day to commit to mother earth one of their oldest and most highly respected members, namely, Mr. John Bastow, who had served his day and generation in a manner most exemplary, both to the Corporation of Bristol, and to the Board of Guardians, the members of that Association, and other bodies with which he was connected. He would suggest that a letter be addressed from that gathering to the bereaved family of Mr. Bastow, expressing its regret at the calamity that had befallen them and offering them their sincere condolences.—Mr. R. F. Ridd proposed "The City and Commerce." Alderman Godwin, in responding, said the trade of the old city had much increased, and there was room for further progress as long as they had the right people to look after public affairs. Mr. G. E. Davies also replied to the toast.—The next feature of the dinner consisted of a presentation to Mr. George Wilkins, one of the oldest members of the Association, who is retiring from business. The President said they desired to recognise his long service to the Association and show the appreciation of the members. The Association had selected a silver salver, hand-hammered, and engraved with the following inscription:—"The Bristol Master Builders' Association, 1905. Presentation by the members of this Association to George Wilkins upon the occasion of his retirement from business life, in recognition of the long and valued services he has given to the Association, extending over a long period, during which time he occupied the presidential chair for two years." The salver was then handed by the President to Mr. George Wilkins, who, in acknowledging the presentation, said he had been a member for thirty or forty years, and was able to speak of the better conditions under which the trade was carried on now compared with what prevailed formerly. As to the National Federation, out of fifty-four half-yearly meetings he had attended forty-five. Mr. H. J. Spear, as

been connected with Mr. Wilkins in official capacity for a long period, added words of appreciation, and then read a letter which Mr. George Humphreys, the writer, had written, expressing regret at inability to be present. The writer bore money to the worth of Mr. George Wilkins, had done so much during thirty years for Association and for the National Federation of Master Builders. Mr. Arthur Lee next read "The National and South-Western Association of Master Builders of Great Britain." He said he would like to see the builders combine to spread abroad a knowledge of the economic facts connected with their training, and then there would be trouble and fewer contests between labour and capital. He remarked that the building was the greatest of all trades of the country, not excepting agriculture, and the industry of their trade was naturally an indication of the trade of the whole country. He was happy to believe that they had ended at the bottom of the depression, and they would have better times before long. Mr. A. Dowling and Mr. W. F. Long joined to the toast.—Mr. F. N. Cowlin read "The Engineers, Architects, and Surveyors." Mr. A. P. I. Cotterell and Mr. J. Skinner responded.—The toast of the "Builders" was given by Mr. F. N. Cowlin, and Mr. T. S. Cotterell, Mr. W. H. Brown, in substance "Kindred Associations," said the industry of their Association had done much to improve trade, as it had afforded opportunities for smoothing over difficulties that arise between the architect, builder, and workman. The responders were Mr. F. J. Moore, Mr. A. J. Jenkins (President of Bristol Cabinet Manufacturers' Federation), Mr. R. W. Moon (Newport).—Mr. G. H. N. proposed "The Bristol Master Builders' Association." The President responded, and said the necessity of safeguarding apprenticeship, so that they might have more workmen in the future. Mr. Ridd spoke to the toast.

RECREATION GROUNDS, AND PLANTING.—It is stated that the Corporation of Lambeth have proposed to contribute a total sum of £2,000, and that £1,500, been collected by the committee, towards £2,000, which are required to complete purchase of the remaining 6 acres of which form the natural boundary of well Park which it is proposed to re-plant to that extent. The ground, nearly 10 acres, situated between Edith and Tadmor, which is being drained and levelled, will shortly be available for cricket and football.—The London County Council's Local Powers Bill contains clauses for the purchase of 40 acres in Hendon parish adjoining the land owned by Eton College, for siting one than 4 acres of their Avery Hill at Eltham for purposes of a training ground to be established in the house there, affecting divers exchanges of property by certain lands now belonging to the London County Council, and the acquisition of Hackney Almshouses, in the Borough of Islington, in order to enlarge the recreation ground, to be vested in the Metropolitan Gardens Association have prepared an plan, of which the Borough Council, for the laying out of the disused ground belonging to All Saints' Church, and are in correspondence with the Corporation of the City in respect of the purchase of the riverside pleasure ground with a steam-bath situated at the well Fish Market, an area of nearly 10 acres. The Corporation purchased the land for £175,000. As an accessory, rather than a rival, of Billingsgate Market, but the land has not proved to be a financial success. Through the agency of the Metropolitan Forestry Association, of which Mr. Lodge is President, a plantation of 100,000 ash and alder trees, laid out by Professor Fisher, has been made under 4 acres of the land, and a similar plantation made in Hendon Hill, at Old Hill.—The annual celebration "Arbor Day," at Eynsford, in Kent, recently observed by the planting, by the Horticultural College for

Women at Swanley, by the children of the village, and others, of trees along the west side of the road leading to the railway station from the village. The custom has been observed there since 1887; the trees are set in form of an arcotic—on this occasion to express Browning's lines:—"The best is yet to be! The last of life, for which the first was made."

Legal.

BUILDINGS WRONGLY LICENSED BY BOROUGH COUNCIL:

CASE UNDER THE LONDON BUILDING ACT.

MR. LANE, K.C., the magistrate sitting at the West London Police Court, had before him, by adjournment on the 28th ult., after several lengthy hearings, a summons taken by the London County Council against the Fulham Football and Athletic Club, Ltd., for retaining a temporary building on their ground without obtaining the approval and licence of the London County Council, required under sections 82 and 83.

Mr. Bodkin, instructed by Mr. Childers, of the Solicitors' Department of the London County Council, supported the summons, and Mr. G. Humphrey, instructed by Mr. Blanco White, appeared for the Club.

The buildings, which were erected in August, 1903, afforded seating accommodation for 1,000 people, in tiers varying from 3 ft. to 30 ft. above ground, and comprised also in the lower portion dressing-rooms and bathrooms, and lavatories for the players, also refreshment-rooms, storerooms, etc. The various rooms were lighted and warmed by gas, and a proper system of drainage, etc., was established. The buildings, except as to the materials and method of construction, had more the character of permanent buildings than temporary structures. They were constructed with wood framing braced in places with iron rods and straps, covered and enclosed externally below the tiers of seating with corrugated iron, and were also roofed with corrugated iron.

The contractors for the buildings, Messrs. Robert Hies, Ltd., of Fulham, erected them under a licence granted by the Fulham Borough Council for a temporary wooden structure for one year, on the condition that the structure was to be erected to the satisfaction of their officer, the Borough Engineer and Surveyor, which licence was renewed in September, 1904, for one year.

After hearing the evidence and the lengthy arguments of counsel, the magistrate decided that it was a composite structure, made of wood and iron, and therefore was within the jurisdiction of the London County Council, requiring their approval under section 82 of the London Building Act, 1894. The magistrate further made a demolition order that the buildings should be completely removed within five months (i.e., the end of the present season), and imposed a nominal fine of 10s., each side to pay their own costs.

BUILDING OWNER'S ACTION TO RESTRAIN ARCHITECT ACTING AS ARBITRATOR.

THE case of *Nye v. Crossley* came before Mr. Justice Warrington, in the Chancery Division, on the 6th inst., an action by the plaintiff, a land owner of Brighton and Hove, against Mr. Crossley, a builder, and Mr. G. M. Jay, an architect, claiming a declaration that another architect, a Mr. Puttick, and not Mr. Jay, was the proper arbitrator under a building contract entered into between the plaintiff and Mr. Crossley, and the plaintiff also claimed an injunction restraining Mr. Crossley proceeding to arbitration before Mr. Jay, and to restrain Mr. Jay from holding the arbitration.

No evidence was called, it being agreed that the question involved turned on the construction of the contract. The facts of the case and the contentions of counsel sufficiently appear from the following judgment.

Mr. Justice Warrington, in giving judgment, said that in this case a dispute had arisen between the plaintiff and the defendant, Crossley, under a building agreement dated April 22, 1903, and the question he had to determine was whether the defendant, Mr. Jay, was the arbitrator agreed upon by the parties as the person by whom that dispute was to be solved, or whether, on the other hand, Mr. Puttick was the person agreed upon as arbitrator, or, in the alternative, whether there was any arbitrator at all, so that, having regard to the form of the agreement, the Court would have to appoint an arbitrator under section 6 of the Arbitration Act of 1889. The first question, if he was of opinion that Mr. Jay was the arbitrator agreed upon by the parties, was whether circumstances had arisen which would be sufficient to justify the

Court in allowing plaintiff to revoke the submission to Mr. Jay which, by the Act, he was prevented from doing except by the leave of the Court. The facts were these:—In 1903 Mr. Nye had certain land upon which he desired to build some houses, and he accordingly procured plans, specifications, and bills of quantities to be prepared by the defendant, Mr. Jay, an architect. The defendant, Mr. Crossley, was employed by Mr. Nye to build the houses, and the terms upon which that business was to be done were regulated by the agreement in question, viz., the agreement of April 22, 1903. This agreement was made between the defendant, Mr. Crossley, described as the builder, of the one part, and the plaintiff of the other part. It provided, *inter alia*, that the builder should be paid so much by the plaintiff to erect and build for him on the piece of land in question certain houses, according to drawings, specifications, and quantities prepared by the architect, Mr. G. M. Jay, in a substantial and workmanlike manner, and, in all respects, to the reasonable satisfaction of the said architect. It was sufficient to say that the agreement provided, in the very usual manner, that the person described in the agreement as the architect was to determine the allowance of time in respect of strikes or inclement weather, and so on, and he was to give the certificates on which the purchase-money was to be paid. He was to be satisfied as to the construction of the buildings, and he was to direct the builder as to any alterations or deviations from the plans, and so on. Further, in the event of the builder becoming bankrupt, and the proprietor being entitled under the terms of the agreement to terminate it, then the proprietor was to pay to the builder such amount as the architect should award. Then, finally, there came the arbitration clause, which provided that, in the event of any disagreements between the parties in any way relating to the work contracted to be carried out, such matters should be referred to the architect, whose decision should be final and binding on both parties. Before going further, what was the meaning of the agreement? Mr. Jay was described as the architect, who had prepared the drawings, specifications, and quantities. The same expression, "the architect," was the only expression used throughout the agreement in connexion with the person who was to do the things he (his lordship) had enumerated. It seemed to him that, upon the true construction of the agreement, the person described as "the architect"—in other words, Mr. Jay—was agreed upon by the parties as the person by name who was to do the several things mentioned in the agreement, including that of finally deciding any question which might arise between the parties. If the construction he had put upon it was the true one, it was not competent for either Mr. Crossley or Mr. Nye to vary that agreement without the consent of the other in any particular. What happened afterwards was this. On April 17, Mr. Jay made a proposition to Mr. Nye in reference to the supervision of the work. That proposition had not been accepted on April 22, but certain verbal arrangements were made between Mr. Nye and Mr. Jay, and the result was put into writing by Mr. Jay on April 25—which was after the date of the agreement—in a letter. This letter stated that, in confirmation of the verbal arrangement, he (Mr. Jay) would undertake the sole supervision of the erection of the four houses for 24 per cent. on the cost. It seemed to his lordship that that agreement was entirely separate from the agreement between Mr. Nye and Mr. Crossley. It would have been competent, as far as he could see, for Mr. Nye, if he had chosen, to appoint some other person to supervise the work, although he could not have altered the agreement. The work went on for some time, and two certificates had been given by Mr. Jay, when, on December 30, 1903, Mr. Nye's solicitors wrote a letter to Mr. Jay stating that, in the previous April, Mr. Jay had contracted to superintend the erection of the four houses on behalf of Mr. Nye, and that Mr. Jay had neglected to carry out his contract, that Mr. Nye would hold him responsible for any damage he might suffer, and that the contract must be considered at an end. What was the contract which was at an end? The contract of April 25. It could not be any other. That was the only contract then pending between Mr. Nye and Mr. Jay. Mr. Nye had put an end to the appointment of Mr. Jay as the person to supervise the work, but he had no power to alter the agreement between him and Mr. Crossley, and Mr. Jay remained the person to give the certificates, and to do other things mentioned in the agreement. Mr. Nye followed up the letter of December 30 by entering into an arrangement with Mr. Puttick, by which he was to take over and continue the supervision of the work in place of Mr. Jay, and he notified that to

Mr. Crossley by a letter, dated January 14. After that Mr. Crossley consented to apply for and accept certificates from Mr. Puttick, and when an occasion arose for certain alterations and deviations from the drawings, Mr. Crossley consented to accept his directions. The building work was finished, and disputes arose which came within the arbitration clause, and would properly be submitted to the arbitrator. As an incident in the case, his lordship said he ought to mention that Mr. Jay had in his possession certain papers, and, in particular, the bills of quantities. He was asked to deliver up the papers, and he said he would deliver up the bills of quantities, or copies of them as soon as copies had been made. But the plaintiff appeared not to have been satisfied with that, and he issued a plaint in the County Court against Mr. Jay on February 10. Shortly afterwards Mr. Jay gave him copies of the bills of quantities, and then Mr. Nye withdrew the summons, and on November 16, the building having been completed, Mr. Crossley, the defendant, wrote pointing out that the case was one which would have to be referred to arbitration, and on December 1 Mr. Puttick, acting, no doubt, under the directions of Mr. Nye, gave Mr. Crossley notice as arbitrator under the contract, appointing the following Tuesday as the day when he would hear the parties at his office, and proceed with his award. On December 2 Mr. Crossley, by his solicitor, wrote to Mr. Puttick refusing to recognise him as the arbitrator, and insisting that Mr. Jay was the arbitrator. That was followed up by a notice from Mr. Jay that he was the arbitrator under the contract, and that he took upon himself the duties of arbitrator, and he appointed a day for the hearing of the arbitration. Subsequently, there being these disputes, Mr. Jay consented to postpone the hearing for a week from December 12. On December 12 a writ was issued and notice of motion was given for an injunction. In his lordship's opinion the construction of the agreement, when one considered the position of the parties, was reasonably clear, viz., that they had decided to have the person who had prepared the drawings, specifications, and the quantities as the person who was to decide the questions between them. In his opinion, therefore, Mr. Jay was the arbitrator, and the arbitrator upon whom the parties agreed. It was then said that, even assuming that to be the true construction of the agreement, in the events which had happened, the parties had subsequently agreed to Mr. Puttick being substituted for Mr. Jay. He could not come to that conclusion. That was really the only question he had to decide except this, as to whether, assuming he was right in the decision he had come to on the construction of the agreement, circumstances had arisen which would justify him in allowing the plaintiff to revoke the submission. What had he here which induced him to hold that Mr. Jay would be biased? It was said that there had been a dispute between Mr. Jay and Mr. Nye. That was quite true. Mr. Nye had accused Mr. Jay of being negligent in his agreement for supervision, and Mr. Jay had said, in quite temperate language, that he did not know what the negligence charged against him was. It seemed to his lordship that that was not enough. He was not to assume that because differences had arisen between the parties that Mr. Jay would, in a judicial capacity, show a bias against one of the parties. Then it was said that there had been actual litigation between Mr. Jay and Mr. Nye, and that, that being so, the case came within the ruling in *Baring Brothers v. Doulton*. Well, there had been litigation if it could be said that the issue of the summons in the County Court had been mentioned as litigation. But he could not regard that as being enough to justify him in holding that Mr. Jay would bear such a grudge against Mr. Nye that he would not be impartial. He had to say whether, in his opinion, there was such a probability of bias on the part of Mr. Jay that he would not say that. He must therefore refuse that part of the plaintiff's claim. The plaintiff had put his claim under different heads. He first alleged that Mr. Jay was not the arbitrator, and he secondly alleged that Mr. Puttick was. At the plaintiff had failed on both points on which he had sought to obtain the declarations, there must be judgment for the defendant, with costs.

Order accordingly.

Mr. Carson, K.C., and Mr. Beddall appeared for the plaintiff, and Mr. Rowden, K.C., and Mr. Mark Romer for the defendant. Mr. Crossley, and Mr. Norton, K.C., and Mr. Stone for Mr. Jay.

CLAIM BY BUILDERS AGAINST LIFT CONTRACTORS.

THE CASE of Cowtan & Sons, Ltd., v.

Waygood & Co., Ltd., came before Mr. Justice Ridley and a special jury, in the King's Bench Division, on the 6th inst., an action by the plaintiffs, a firm of builders and contractors, against the defendants, contractors, for the construction of lifts, for an indemnity against liability in respect of compensation paid by the plaintiffs to one, Jobelmann, under the provisions of the Workmen's Compensation Act under an award of the County Court judge of Westminster, including the costs of the proceedings. The defence was a denial of liability.

The short facts were as follows:—In October, 1903, the plaintiffs were engaged in doing work at a house in Grosvenor-square, and Jobelmann was employed by them as a painter. The defendants at the same time were, under a separate contract with the owner, constructing a lift on the premises, the structural work in regard to which had been done by another firm of contractors. The plaintiffs alleged that the defendants had control of the open shaft in which the lift was to run, and, in consequence of their failing to sufficiently protect the entrances to it, Jobelmann, who had been told to go upstairs to breakfast, fell down the shaft and sustained severe injuries. Jobelmann sued the plaintiffs under the Workmen's Compensation Act, and, in the result, an award was made in favour of the workman against the plaintiffs. On the application of the plaintiffs defendants were made third parties to the proceedings, and they now sought an indemnity against the defendants for the compensation which they had been put on the ground that the accident was due to the defendants' negligence.

The defendants called evidence to show that there had been no negligence on their part, and that the accident was due to the contributory negligence of Jobelmann.

In the result, the jury, in answer to questions put to them by the learned judge, found that the defendants had possession and control of the shaft so as to place on them the duty of protecting the opening to it, but that defendants had not been guilty of negligence.

His lordship, on these findings, directed judgment to be entered for the defendants.

Mr. Robert Wallace, K.C., and Mr. G. A. Scott appeared for the plaintiffs, and Mr. H. F. Dickens, K.C., and Mr. A. B. Cane for the defendants.

ACTION AGAINST CONTRACTORS FOR ALLEGED NEGLIGENCE.

In the King's Bench Division, on the 8th inst., Mr. Justice Ridley and a special jury concluded the hearing of the case of *Phillips v. Kingston, Miller, & Co., Ltd.*, an action by the plaintiff, Mr. Lionel Phillips, of No. 35, Grosvenor-square, who sued the defendants, a firm of contractors, for negligence in Oxford-street, for damages for alleged negligence on their part in constructing a temporary super-room at the plaintiff's house, in consequence of which the super-room was destroyed by fire, causing damage to the plaintiff. The defence was a denial of liability. Defendants counter-claimed for work and labour done.

Sir Edward Clarke, K.C., Mr. Bankes, K.C., and Mr. J. C. Graham appeared for the plaintiff, and Mr. H. F. Dickens, K.C., and Mr. G. Wallace for the defendants.

Sir Edward Clarke, in opening the case, said that in June, 1903, the plaintiff proposed to give a party at his house in Grosvenor-square, and, having, in 1899, employed the defendants to erect a temporary super-room, when everything was most satisfactorily done by the defendants, he employed them again. Instructions were given to the defendants that the arrangements were to be the same as on the earlier occasion, with one exception. The room was to be erected on the leads at the back of the house. The actual construction of the room was handed over by the defendants to Messrs. Simmonds & Sons. About a week before July 17, the erection of the structure was begun, it consisting of uprights and corners of wood upon which canvas coverings were stretched. Inside there was another covering of canvas which was hung with mauls, and the room was lighted by electric light. On July 17 the structure was finished, and on that evening the muslin in the super-room took fire, and in ten minutes the whole structure was in a blaze. The flames rushed into the house, and a great deal of damage was done. Afterwards an inquiry was held into the cause of the fire. For that purpose an inspection was made of the premises, and the result of that inspection was that the installation put in by the defendants was having regard to the inflammable nature of the hangings of the super-room, was stated to be very unsafe, and that proper precautions had not been taken to render it as safe as might be by the use of a proper number of fuses. In addition, no precautions

had been taken to render the hangings of the room non-inflammable, a course which was almost invariably adopted in the case of structures of this kind. The learned counsel said that the defendants had insured the valuable furniture, and the plaintiff had been put to great expense. The jury, however, would not be troubled with any question of the amount of damage done, as it had been arranged between the parties that, if necessary, the damages should be subsequently assessed. The question for the jury would be whether the defendants had not failed to provide a properly-constructed and safe structure. If that was the case, they would be responsible for the damage sustained by the plaintiff.

Expert evidence was called on behalf of the plaintiff to the effect that the temporary electric light installation put in by the defendants for illuminating the super-room was of such a nature as to involve risk of accident, and that it was not a proper system to use in a building where there was a quantity of inflammable material such as muslin.

Mr. Dickens, in opening the defence case, stated that the installation put in by the defendants was not defective, but was a perfectly proper one for the purpose. He said that the defendants would be able to show that the fire could not have been caused by the electric wires because at the time when it broke out there were no lights at the place where it originated. As to the alleged lights, with the exception of the pilot light in the middle of the room, had been switched off. It was possible that the fire was originated by a spark from a chimney outside, which being fanned by one of the ventilators, the muslin on fire. He submitted that no reasonable precautions had been taken by the defendants, and that there had been negligence on their part.

Evidence was called on behalf of the defendants to the effect that the installation put in by them was not defective, but was a perfectly proper one for the purpose for which it was required, and that defendants had not been guilty of any negligence. The result was for the defendants, both on the claim for counter-claim, and judgment was entered accordingly.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

1,070 of 1904.—J. E. FAIRWEATHER and J. RIDLEY: *Sash Balances*.

This relates to sash balances in which a spring-operated toothed wheel adapted to be mounted on a frame gears with a toothed rack adapted to be mounted on a sash guided by the frame, consisting in the combination of a casting, gear wheel, a detent, a detent release, and a sash shifter.

1,268 of 1904.—W. B. BASSETT and E. BASSETT: *Machine for Forging Bolts, Nuts, or Screws from Bars*.

This consists in the combination with an annular rotatable carrier having an inner series of bed or holding dies adapted to successively receive the end portion of a bar from which predetermined lengths are to be cut, of form bolts, screws, spikes, or the like, so that a working die or dies carried by the carrier and adapted to co-act with said bed or holding dies, so as to form by end pressure on the successive length of bar a head or other portion of a shape differing from that of the bar itself, of stationary and movable shear capable of severing said predetermined length from the bar, the movable shear blade being so geared that the carrier has to be caused to each intermittent rotary movement of the latter to perform the cutting operation, and thereafter return to operative position, and bring thereto a fresh shear blade.

1,269 of 1904.—W. B. BASSETT and E. BASSETT: *Apparatus for Use in the Manufacture of Screws*.

An apparatus for presenting a successive bolts or screws to screwing tools, comprising an endless chain or conveyor adapted to maintain the bolts or screws in position on a chain, ratchet gear, and a continuously rotating cam shifter gear to intermittently actuate said ratchet gear in time with the operation of the screwing tools, and means for movably holding the bolts or screws while being operated on.

1,270 of 1904.—W. B. BASSETT and E. BASSETT: *Machine for Automatically Tapping Nuts*.

An apparatus for automatically and continuously tapping nuts, consisting in the combination with a vertical tap, means for producing

* All these applications are in the stage of opposition to the grant of Patents upon them, and he made

regular movement of the tap and nut fed
erone relatively to one another about their
mmon axis, means for causing the nut to
initially take on to the threads of the tap,
sliding device for the tap adapted to in-
pendently support the tap in position and
pable of being discharged therefrom, and
mechanism operatively connected with said
sliding device and adapted to cause said
device to be in turn disengaged from the tap
as to permit of the nut when threaded pass-
clear of the tap.

175 of 1904.—A. J. NORRIS: *Handle*
Specially Applicable to Furniture, and the
like.

handle for articles of furniture, or the like,
consisting of a back plate having a hole or
holes therein, a loose boss or bracket or
bosses or brackets, each having a front part
projecting through one of said holes from the
of the back plate, and a lateral exten-
sion or base adapted to lie between the back
plate and the article of furniture, a handle
oper mounted on the projecting front part
of the boss or brackets, and
means for fixing the back plate with the article
furniture.

15 of 1904.—H. WARRINGTON and H. J.
WARRINGTON: *Working of Ovens for Use in*
Baking Bricks, and the like.

method of working ovens for use in bak-
ing bricks, tiles, and the like, same consisting
arranging two or more ovens in commun-
ication with one another and with a chimney
common to both or to all and causing the
hot gases which escape from one oven to
pass to the next in order, thereby utilising the
hot gases in the preliminary heating of the
of oven.

12 of 1904.—S. SNOWDON and E. E. LAW-
SON: *Outdoor and like Seats.*

seats relates to seats, consisting in the com-
bination with the arms of the reversible back-
rest covers pivoted on rods secured
back backs, stationary shafts secured in the
of the arms, tubes surrounding the
of the shafts engaging with the shafts and
the tube, hinges, or movable seat surfaces,
means for adjusting the covers between the
longitudinal arms.

1 of 1904.—G. E. SPARKS: *Construction of*
Units for Rods and other like Articles.

consists of pieces of metal or other suit-
material forming male and female con-
n. The male end is shaped either wedge-
shaped, or other angular shape, and
the female end is provided with a suitably
shaped aperture for receiving same, and
the joint is made a tight or loose joint.
In the joint is required, a partially
movable joint a pin is passed through the
male and female parts. Also on the outside
of the male or female socket a screw-threaded
is provided which is fitted with a
nut or collar. The two sockets are
joined so that the same passes over the
joint, the two thereby remaining
until the nut or collar is reversed, a
member for receiving a rod or other like
is made larger at the bottom. A
which is also provided fixed in the bottom of
A which prevents the rod from turning.

of 1904.—F. TYRRELL: *Clips for Attaching*
Electric Cables, or the like, to Walls
or other Surfaces.

invention relates to clips for fastening
electric cables, or the like, to walls or
surfaces and its object is to provide a
clip which will cut into a soft metal pipe or
the insulation of an electric cable. Accord-
to this invention the main part of the
clip is provided with a rim on its inner edge
capable of standing at right angles to the
part. This rim may extend all the way
and serve to retain a lining, which is
on the inner side of the clip prior to
it in position on the pipe or cable.

1 of 1904.—S. SANDERS: *A Pipe Joint.*

for obtaining a fluid tight joint be-
tween and similar tubing and branches
of pipes, consisting of an angular
clip formed on the end of the tube
upon the face of the branch, and
for compressing the angular flexible
end of the face.

1 of 1904.—W. KANE: *Heating Apparatus.*

the object of this invention to provide
the unitary independent heating ap-
paratus consisting in itself a complete heat-
ing apparatus adapted for use with complete heat-
pipes consists of a series of nested
chambers communicating at the top with
being open to the atmosphere and
the bottom of the open ends of the pipes,
below the open lower ends of the
in the preferred construction the ends

of the tubes are expanded in a top and base
plate. To the top plate is secured a slightly
dome-shaped crown cap forming the upper air
space, and to the base plate is secured a re-
cessed base cap forming the lower water space.

16,437 of 1904.—H. E. KENNY: *Weather Strips*
for Windows.

A metal weather strip, consisting of a sealing
flange formed of a strip bent upon itself, and
having at one edge a series of securing flanges
extending at an angle thereto, part of the
series being bent under the sealing flange.

5,851 of 1904.—J. TIPPER: *Manufacture of*
Bolts for Doors and Gates.

A double-headed door or gate bolt having a
pair of staples, which are independent of the
staples which carry the bolt pin, projecting
from the bolt plate in positions which adapt
them, respectively, to allow a hasp which is
carried by the pin to be engaged therewith
when the bolt is in one or other of what are
its extreme positions when in use.

5,997 of 1904.—W. E. HOPKINS: *Coin-freed*
Locks or Fastenings for Doors.

This invention consists in coin-freed locks or
fastenings for doors of apartments, and has
for its object to provide a means whereby an
entrance can be made to the apartments when
the same is occupied. In carrying this inven-
tion into effect the one side of the recess in
the door frame, into which the supplementary
bolt is shot when closed, is made parallel with
the said bolt, but of the opposite side an in-
clined plane of just sufficient angle is made, so
that when the bolt is shot from the inside, and
the occupant is unable to withdraw same, an
attendant in possession of a special and addi-
tional key may actuate the main bolt, and by
then pulling or pushing, as the case may be,
the said door, the end of the supplementary
bolt will thus come into contact with the in-
clined plane in the recess of the aforesaid
door frame, and so force the supplementary
bolt back into the body of the lock and re-
lease the door.

4,659 of 1904.—B. C. SIMPSON: *Machinery for*
the Manufacture of Slabs or Blocks of
Plaster, Concrete, or other Material.

This relates to an apparatus for the manu-
facture of slabs or blocks of plaster, concrete,
or other suitable material, wherein the mould
box may have any number of cells or
chambers separated from one another by
dividing partitions, which partitions and also
the ends of the mould box, which form the
outer surfaces of the end slabs or blocks, are
fixed, excepting that the partitions may, if
required, be capable of a slight lateral motion
to facilitate the expulsion of the slabs or
blocks, and the said slabs or blocks are ex-
pelled from the mould by means of plungers,
which form one end of the cells or chambers
of the mould box, and are operated on by
machinery so as to travel through the said
cells or chambers and expel the slabs or
blocks out of the opposite side of the mould
box which is opened to allow of the exit
of the said slabs or blocks.

13,237 of 1904.—J. H. HARRIS: *Roof Glazing.*

This relates to roof glazing, consisting in
forming a framing and attaching to said fram-
ing a lead bar having grooves in which suit-
able cords are placed to form a bedding for
the glass, condensation channels, and wings
which are bent down to form a capping.

24,371 of 1904.—E. COIGNET: *Reinforced or*
Armoured Concrete Construction.

This invention relates to reinforced or
armoured concrete construction. The general
principle governing this kind of construction
is to employ the iron reinforcement to resist
the tensile stresses and the beton or concrete
to resist the compression stresses, and in bodies
required to resist flexion it is desirable to
leave as much space as possible between the
bars which take the tensile stress and the
concrete which takes the compression. This
rule, however, need not be strictly adhered
to in practice, and, according to the present
invention, compression bars as such are also
employed to lessen the dead weight, to permit
of suitable connexion between the tensile and
compression parts by metal dies, and to enable
beams to be prepared in advance, which, after
being placed in position, support the centring,
which bears or supports the fresh concrete
as it is laid down, thus assisting in the
general resistance of the work.

24,922 of 1904.—K. AMENDT: *Asphalted Par-*
quet Floor Slabs.

An improvement in the parquet floor plate
described in the British Specification No.
24,823, 1902, which consists in covering the
wood with a tissue—for instance, a tissue of
jute-yarn—upon which the asphalt is poured,
for the purpose of increasing its power of re-
sistance, and for preventing its peeling off
from the wood.

26,545 of 1904.—E. STENZEL: *Moulded Stone*
for Window Sills.

The article of manufacture forming the sub-
ject of this invention is a moulded stone
profiled for the production of window sills;
this is provided with a ledge to receive the
window frame, and with a downwardly in-
clined face, and consisting preferably of clay
free from lime of 5cm. thickness. Such pro-
file stones being laid on an upright course, a
window sill is produced without it being
necessary, as heretofore, to hew each stone in
order to produce the profile given by the new
stone. It is known that with such an arrange-
ment with the ordinary masonry stones much
time and material are lost, stones being
wasted and difficulty being experienced in
disposing the stones uniformly, while it became
absolutely necessary to plaster the sills built up
in this way, or else to dispense with the slop-
ing face, and so lose the conditions of shed-
ding off rain, etc.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters,
and papers read at meetings rests, of course, with the
authors.

We cannot undertake to return rejected communica-
tions; and the Editor cannot be responsible for
drawings, photographs, manuscripts, or other docu-
ments, or for models or samples sent to or left at this
office, unless he has specially asked for them.

Letters or communications (beyond mere news items)
which have been duplicated for other journals are NOT
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name and address of the sender, whether for publica-
tion or not. No notice can be taken of anonymous
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We are compelled to decline pointing out books and
giving addresses.

Any commission to a contributor to write an article,
or to execute or lend a drawing for publication, is given
subject to the approval of the Editor or drawing, when
received, by the Editor, who retains the right to reject
it if unsatisfactory. The receipt by the author of a
proof of an article in type does not necessarily imply its
acceptance.

All communications regarding literary and artistic
matters should be addressed to THE EDITOR; those
relating to advertisements and other exclusively busi-
ness matters should be addressed to THE PUBLISHER,
and not to the Editor.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.		
January 26.—By LOCKE & SON (at Birmingham).		
Claverdon, Warwick—Ardencote Estate, 81 acres, f.		£8,000
January 30.—By J. BOTT & SONS.		
Herne Hill.—41, Gubyon-av., ut. 70 yrs., g.r. 72, 15s., y.r. 50l.	550	
By NORMAN & SON (at Stratford).		
Stratford.—9, Water-ls., f. a.r. 70l.	920	
9 and 11, Earl-st., f. w.r. 48l. 2s.	400	
46 Martin-st., f. w.r. 31l. 4s.	405	
Platford.—3, 5, and 7, Stratford-rd., f. w.r. 62l. 8s.	550	
Forest Gate.—471, Katherine-rd. (s.), f. a.r. 35l.	460	
Silvertown.—45, Cranbrook-rd., and 1, Evelyn-rd., f. w.r. 62l.	480	
January 31.—By LINNETT & LANE.		
Malden Vale.—35, Warwick-rd., ut. 46 yrs., g.r. 24l., e.r. 110s.	395	
Harlesden.—88 and 92, St. John's-av. (s.), ut. 99 yrs., g.r. 16l. 10s., y.r. 90l.	800	
By A. ROBERTSON.		
Hackney.—2, Wick-rd. (s.), ut. 38 yrs., g.r. 8l., y.r. 24l.	165	
By FREDERICK WARMAN.		
Highbury.—123, Highbury New-pk., ut. 45 yrs., g.r. 10l. 10s., p.	820	
Finbury Park.—32, Finbury Pk.-rd., ut. 61 yrs., g.r. 9l. 9s., y.r. 50l.	465	
Muswell Hill.—Sydney-rd., a freehold building plot	100	
By WESMORE & YOUNG.		
Sydenham.—8, Hillcrest-rd., ut. 55½ yrs., g.r. 12l. 10s., e.r. 80l.	600	
February 1.—By MARK LIEBL & SON.		
Mile End.—51, Bardett-rd. (s.), ut. 45 yrs., g.r. 5l. 10s., e.r. 50l.	670	
Stratford.—47, Chandos-rd., i. w.r. 28l.	245	
By EDWARDS, SON, & BIGWOOD (at Birmingham).		
Bromsgrove, etc., Worcester.—"Durance Farm," 123 a. 0 r. 33 p., f. p.	3,100	
Smethwick, Staffs.—115 and 116, Rolfe-st. (s.), i. y.r. 32l. 10s.	330	
February 2.—By J. & W. JOHNSON & CO.		
Bethnal Green.—Braemar-st., "The Hope" b.h., with house adjoining, f. y.r. 64l. 10s.	1,100	
By G. W. & H. G. POTTER.		
Hampstead.—30, Fitzjohn's-av., f. p.	7,000	
By STIMSON & SONS.		
Brixton.—84, 86, and 88, Bishop's-rd., ut. 56½ yrs., g.r. 12l. 15s., w.r. 108l. 12s.	810	
5, 7, and 9, Farrar-st., ut. 15 yrs., g.r. 9l., w.r. 88l. 6s.	380	
1, Frederick-cres., ut. 56½ yrs., g.r. 10l. 10s., w.r. 39l.	285	
10, Myatt-rd., ut. 62½ yrs., g.r. 4l., w.r. 39l.	280	
9, 11, and 13, Lislovale-st., ut. 56½ yrs., g.r. 12l. 10s., w.r. 108l. 12s.	755	
22, Belinda-rd., ut. 63 yrs., g.r. 5l., w.r. 34l. 16s.	210	
15, Kipton-rd., ut. 62½ yrs., g.r. 6l. 10s., w.r. 84l. 10s.	335	

Light & Son.....	12,085	Davey & Jones ..	11,368
E. Nightingale ..	11,936	J. Parsons	11,356
Parsons & Co., Ltd.	11,900		

TENDERS—Continued on page 163.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, etc., still open, but not included in this list, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered.
*Preparation and Compilal of Plan, etc.	Fakenham P.S.A. ....	.....	Feb. 25

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Cast-Iron Pipes and Specials	Hull Corporation	F. J. Bancroft, City Water Engineer, Alfred Gelder-street, Hull.	Feb. 11
Thirty-seven Cottages at Mountain Ash	Aberffred Building Club	Morgan & Elford, Architects, Mountain Ash	Feb. 15
Twelve Steel Wreck Buoys	Trinity House	A. Owen, Trinity House, London, E.C.	do.
Cast-Iron Buoys Sinks	do.	do.	do.
Deck Bridges	Rohilkund and Kumaon Ry. Co.	E. I. Marryat, 237, Gresham House, Old Broad-st., London, E.C.	do.
Seven Houses, Rector-lane, Winton	do.	T. Robson, Derwent View, Winton	do.
Painting House, White Horse Inn, Elgin	do.	R. Pratt, Architect, Town and County Buildings, Elgin	do.
Dwellings	do.	R. J. Hartley, Waterworks Engineer, Gibbet-street, Halifax	do.
Painting Roof, Swimming Bath, Woodside Baths	do.	T. H. Hartley, Borough Surveyor, Town Hall, Colne	do.
Materials	do.	L. Lord, Borough Engineer, Town Hall, Halifax	do.
Private Street Works	do.	Adkins & Hill, Architects, Prudential-buildings, Bradford	do.
Bradford Golf Clubhouse Extension, Hawksworth	do.	S. Wilkinson, Architect, Sowerby Bridge	do.
Three Houses and Outbuildings, Sear Head, Norland	do.	J. F. Smillie, Borough Surveyor, Tyemouth	do.
350 tons of 24-in. Rubble	do.	do.	do.
450 tons of Northumberland Whinstone Setts	do.	do.	do.
Refuse Destructor Buildings and Boiler House	Middleton Education Committee	S. Pauls, Borough Electrical Engineer, Town Hall, Middleton	do.
Road Works, Pymont Hall-lane	Liverpool U.D.C.	F. Lander, Surveyor, Council Offices, Liversedge	do.
*Works and Materials (One Year)	Buttle Corporation	W. E. Putnam, Borough Engineer, Town Hall, Morley	do.
Steel Rails, Fishplates, and Sleepers (30 miles)	Hendon U.D.C.	Borough Engineer's Office, Town Hall, Borthol	do.
Stores	Crown Agents for Colonies	Council's Engineer, Council Offices, Hendon, N.W.	Feb. 11
Artificial Stone Paving, etc.	Bombay, etc. Railway Co.	Office of the Crown Agents, Whitehall-gardens, London, S.W.	do.
Main Switchboard, etc.	Stourbridge U.D.C.	T. W. Wood, Sec., Gloucester House, Bishopgate-st., Withou, E.C.	do.
Materials	Manchester Tramways Committee	F. Woodward, Surveyor, Town Hall, Stourbridge	do.
Alterations in Sheds, Cattle Market	Glasgow Corporation	J. M. McElroy, 55, Piccadilly, Manchester	do.
Fire Alarms, Telephones, etc., at Asylum	do.	A. W. Bradley, Borough Engineer, Municipal Offices, Bury	do.
Alteration of Council School at Rhodes	Newport Visiting (Lunacy) Comm.	Office of Public Works, City-chambers, Glasgow	do.
Repairs to Platform of Large Hall, Town Hall	Middleton Education Committee	A. Wilson, 46, John-street, Glasgow	do.
Alterations, etc., Court Hall, Monkton	Banbury Town Council	A. J. Wood, Architect, 22, Surrey-st., Strand, London, W.C.	Feb. 3
10-ton Steam Roller	Kxeter Corporation	W. Welburn, Borough Surveyor, Town Hall, Middleton	do.
Metal for Roads, Gorbals and Paisley Division	Hoddesdon U.D.C.	N. H. Dawson, Borough Surveyor, Town Hall, Banbury	do.
Watering Streets	Bradford Corporation	E. H. Harbottle & Son, Architects, County-chambers, Exeter	do.
Shop Front, No. 2, Market-buildings, Kirkgate	Ashton-under-Lyne Corporation	W. H. Hill, 194, Iscom-street, Glasgow	do.
Deep Well Pump for Electricity Works	Glasgow and S.W. Railway Co.	R. Lindon, Surveyor, High-street, Hoddesdon	do.
Painting Work, Sheffield Royal Hospital	do.	F. E. P. Edwards, City Architect, Brewery-street, Bradford	do.
Stores	do.	B. Gough Surveyor, 15, Somers-place, Swansea	do.
Wire Fencing	Mr. F. Brook	J. W. Robinson, Sec. the Board Room, Sheffield Royal Hospital	do.
Pair of Semi-detached Villas at Gulseley	Mr. W. Cloughton	Engineer, St. Enoch Station	do.
Additions to Claybanks, Gulseley	Messrs. Peate & Crabtree	H. Chippindale, Architect, Gulseley	do.
Pair of Semi-detached Villas at Manston	Elland U.D.C.	do.	do.
Roadworks, Duke-street, Elland	Bacup Corporation	G. Hepworth, Surveyor, Brighouse	do.
Annual Contracts	do.	S. E. Smith, Architect, 12, South-parade, Leeds	do.
Alteration of Premises in Wellington-street, Leeds	do.	R. Collins, Surveyor, Public Offices, Enfield	do.
*Supply of Road Materials, Royal Parks	do.	H.M. Office of Works, Storey's-gate, S.W.	Feb. 16
Stores	do.	Boro' Elec. Engrs. Corporation, Elec. Wks., Jubilee-st., Blackburn	do.
Reconstruction of Mipshill-street Bridge	do.	City Surveyor's Office, Town Hall, Manchester	do.
Club Premises and House, Wheatley Hill	do.	H. T. Graden, Architect, 22, Market-place, Durham	do.
Private Street Works	do.	W. W. Woodward, Engineer, Gas Offices, Bloom-street, Salford	do.
1,000 tons of Lime	do.	J. Atkinson, Borough Surveyor, Stockport	do.
Labour for Repairing, etc., Cartageways	do.	do.	do.
Labour for Mason's Work on Footpaths, etc.	do.	do.	do.
Carting	do.	do.	do.
Materials	Sutton U.D.C.	Engineer to Council, Sutton, Surrey	do.
1,000 lineal ft. of Wrought-Iron Railings	Wolverhampton Corporation	W. Clifton, Sewage Outfall Works, Wolverhampton	Feb. 16
Lime to Sewage Works	East Argenteine Railway Co.	E. J. Pennington, Sec., Winchester House, 50, Old Broad-st., E.C.	do.
Three Locomotive Engines and Tenders	Hardingstone R.D.C.	E. J. Sturgess, Surveyor, 13, Lutterworth-road, Northampton	do.
Stone, etc.	Swansea Town Council	Waterworks Engineer, Guildhall, Swansea	do.
C.I. Pipes, Castings, Water Meters, Hydrants, etc.	do.	F. B. Buckley, Architect, 85, Commercial-street, Batley	do.
Stores, Work, etc.	Rhondda U.D.C.	G. Thomas, Engineer, Gas and Water Offices, Pontre, Glam.	do.
Lining Water Tank with Calender's Bit, Shooting	do.	do.	do.
Cement and Concrete Work at Tank	H.M. Office of Works	J. Wager, H.M. Office of Works, Storey's-gate, S.W.	Feb. 16
*Enlargement of Sorting Office, Willemsen	Salford Corporation	Boro' Elec. Engrs. Office, Frederick-st., Pendleton, Manchester	do.
Materials	East Sussex Western Hospital Com.	J. Miles, 173, High-street, Lewes	do.
Making up Road at Sedbrook Hospital, Plumpton	Sheffield Corporation	A. R. Fearnley, Tramways Department, Town Hall, Sheffield	do.
Tramway Stones	Town Hall and Market Co.	A. O. Evans, Williams & Evans, Architects, P.O.-chambers, Pontypridd	do.
Two Lock-up Shops, Pontypridd	Middleton Corporation	G. T. Lyman, Borough Engineer, Town Hall, Burton-on-Trent	do.
Stores, etc.	do.	W. Welburn, Borough Surveyor, Town Hall, Middleton	do.
Materials	do.	E. Parkes, Town Clerk, Town Hall, Eccles	do.
Pitting Vestry Hall, F. pool-nd, Patriotic, at Library	do.	M. Gorman, Secretary, Ross Lea, Llanelli, Mon.	do.
Thirty-five Houses, Blaencynm-road, Llanelli	do.	G. T. Lyman, Borough Engineer, Town Hall, Burton-on-Trent	Feb. 20
Materials	do.	Rectory, Thurlstone, Kingsbridge, South Devon	do.
Church Sch. for Seventy, Thurlstone, Kingsbridge	do.	do.	do.
Materials, etc.	do.	do.	do.
Extension of Hulton Sewage Works	do.	do.	do.
Wiring and Fittings for Electric Light at Stores	do.	do.	do.
Fifty Working-class Houses at Waterville, N. Risa	do.	do.	do.
Supplies	do.	do.	do.
Electricity Stores	do.	do.	do.
Retorts, etc.	do.	do.	do.
Retort Bench	do.	do.	do.
Main Road Material	do.	do.	do.
250,000 Wire Cut Red Bricks	do.	do.	do.
60,000 Wire Cut Blue Bricks	do.	do.	do.
200 tons of Jersey Gravel	do.	do.	do.
Materials and Labour	do.	do.	do.
Carriage Timber	do.	do.	do.
Stone for Roads	do.	do.	do.
*Roadmaking, etc., at Winchmore Hill	do.	do.	do.
*Painting, etc., Rackham-st. Infirmary, Nottingham	do.	do.	do.
*Making-up Roads	do.	do.	do.
*Erection of Free Library, Long Eaton	do.	do.	do.

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered
Quarrying and Carting Road Materials.....	Midlothian C.C.	Road Office, County-buildings, Edinburgh	Feb. 21
Private Street Works	Sowerby Bridge U.D.C.	R. W. Evans, Clerk, Commercial Bank-chambers, Halifax	do.
Switch Panels, etc.	Swindon Corporation	J. G. Griffin, Engineer, Electricity Works, Swindon	do.
Motor Generators and Fine-Wire Balancers.....	Manchester Electricity Committee	P. E. Hughes, Sec., Electricity Depart., Town Hall, Manchester	do.
Materials	Acton District Council.....	D. J. Ebbetts, Surveyor, 57, High-street, Acton, W.	do.
Repair of Roads.....	Masham U.D.C.	C. F. P. Edmundson, Clerk, Masham	do.
Repairs	Stanley U.D.C.	J. Routledge, Surveyor, Council Offices, Stanley	do.
Team Labour	Headington R.D.C.	J. C. Sturges, Surveyor, 13, Lutterworth-road, Northampton	Feb. 22
Road Materials	do.	J. C. Coates, District Surveyor, Hartfield Cottage, New Headington	do.
Carting	Leigh Corporation	T. Hunter, Borough Engineer, Leigh, Essex	do.
Bricks of Red-Pan-Jar, Westleigh	Bucks C.C.	R. J. Thomas, County Surveyor, Aylesbury	do.
23 0 tons of Granite	Hammersmith Borough Council	Borough Surveyor, Town Hall, Hammersmith	do.
Undrained San. Conveniences, Shepherd's Bush Green	Dublin Corporation	City Engineer, City Hall, Dublin	Feb. 23
Are Lamp Carbons	Mulling R.D.C.	C. Souter, Sanitary Inspector, West Malling	do.
Power, Boyston-road, Burnham	Essex R.D.C.	F. A. Camidge, Clerk, 3, Stonegate, York	do.
Stone	Chatham Town Council	C. Day, Borough Surveyor, Town Hall, Chatham	do.
41 lineal yds. Wrought-Iron Fencing, Railway-street	Ilington Borough Council	Town Hall, Upper-street, N.	do.
Annual Contracts	Dore R.D.C.	P. Swillem, Cwn Dulais, Pontiffrid	Feb. 24
Hauling	Commissioners of H.M. Works, etc.	J. Wager, Office of Works, Storey's-gate, S.W.	do.
New Sorting Office, Shepherd's Bush, W.	Newton-in-Makerfield U.D.C.	Stores Clerk, Gas Works, Barlastown	Feb. 25
Supplies	Salford Borough Education Com.	W. H. D. Caple, Architect, Church-street-chambers, Cardiff	do.
Alterations, etc., to National Schools, Baglan	Dept. of Agric. & Tech. Inst., Ireland	Offices of Department, 4, Upper Merion-street, Dublin	Feb. 28
Heating of New Schools, Higher Broughton	East Sussex Roads & Bridges Comt.	W. Stanley Ellison, Architect, 22, Sir Thomas-street, Liverpool	do.
Supply and Erection of Temporary Buildings	Brighouse Highways Committee	F. J. Wood, County Surveyor, County Hall, Lewes	do.
Wesleyan Methodist Church, Durham-rd., Gateshead	Commissioners, H.M. Office of Wks.	S. S. Haywood, Borough Engineer, Municipal Offices, Brighouse	do.
Road Materials, Cartage, and Team Labour	Ealing Town Council	H.M. Office of Works, Storey's-gate, S.W.	do.
Making good River-street	Newton Abbot Union	Borough Engineer, Town Hall, Ealing, W.	do.
New Post Office at Baskin	Glenford U.D.C.	The Clerk, Newton Abbot	Feb. 29
Making of New Road	do.	J. T. Bayrs, Engr., Clarence-chbrs., 39, Corporation-st., Birmingham	Mar. 1
Supplying and Fixing Hydraulic Lift	do.	do.	do.
Cast-iron Pipes (2½ miles)	do.	do.	do.
Laying Pipes, etc.	do.	do.	do.
Brickwater Tower and Pumping Station	do.	do.	do.
Engine and Pump	do.	do.	do.
Road Tank	Naas No. 1 R.D.C.	D. J. Purcell, Clerk, Council Office, Naas, Ireland	Mar. 2
Newbridge Waterworks	Southeast-on-Sea Corporation	E. J. Elford, Borough Surveyor, Southend-on-Sea	Mar. 3
Annual Contracts	Barking Town U.D.C.	H. Hargreaves, Public Offices, Barking, Essex	Mar. 4
Sewerage Disposal Works	Bilston U.D.C.	B. Latham, M.Inst.C.E., Parliament-mans, Victoria-st., Westminster	do.
Annual Contracts, Engineer's Department	Wimbledon U.D.C.	Engineer & Surveyor, Council Offices, Wimbledon	do.
Annual Contracts, Electricity Department	do.	Chief Electrical Engineer, Dunsford-road, Wimbledon	do.
Stone	Culham R.D.C.	F. Chalceour, 59, Stret-street, Abingdon	Mar. 6
Pipe Sewer (Sewerage Works)	Boston U.D.C.	J. Rowell, Engineer, Church-lane, Boston, Lincolnshire	Mar. 7
Sewerage Works, Weston	Runcorn R.D.C.	J. Diggle & Son, Engineers, 14, Victoria-street, Westminster, S.W.	do.
Public Library, High-street, Bromley	Borough of Bromley	Town Clerk's Office	Mar. 8
Electric Lighting Works	Stoke Newington Borough Council	Talbot & Stevenson, Engineers, 26, Victoria-street, S.W.	do.
Concrete to Footways and Bank Streets	South Shields Corporation	S. E. Burgess, Borough Engineer, Chapter-row, South Shields	Mar. 13
Electrical Plant (five contracts)	do.	J. H. Cawthra, Borough Electrical Engineer, South Shields	Mar. 18
Municipal Buildings	South Shields Town Council	Central Hall, Chapter-row, South Shields	Apr. 10
Decorating, etc., St. George's Church, Remunda	Crown Agents for Colonies	Office of the Crown Agents, Whitehall-gardens, London, S.W.	No date.
Pair of Houses, Moorhead, Shipley	S. 171, "Observer" Office, Bradford	W. Clark & Sons, Fourlane-ends, Bradford	do.
Fire Houses, Bradford (Mason Labour only)	do.	F. Harris, 13, High-street, Aberdrie	do.
Two Cottages, Church-street, Abertidwr	do.	H. Higginson, Architect, 3, Lonsdale-street, Carlisle	do.
Alterations, etc., "Green Dragon Hotel," Newtown	do.	W. Tatlow, 20, Fleet-street, Dublin	do.
200 hds. Furnaces for Calcium Carbide Manufre.	do.	The Manager	do.
Sinking Shaft at West Stanley Colliery	do.	T. Bouthland, Brickmaster, Ashington	do.
Asphalting 200 sq. yds. Ashington Colliery	Loughborough Corporation	C. E. Robinson, Engineer, Blackbrook, near Loughborough	do.
Machines for Washing Broken Stone for Clack's Mfg.	Mrs. Lolley	T. Stokes, Architect, Thirsk	do.
Villa, Hawthwaite, near Basingwold	Steyning Union	W. Lolley, Avenue-crescent, Harehill-road, Leeds	do.
Four Houses, Sherburn	do.	Clark, Union Office, New Shoreham, Sussex	do.
Erection of New Infirmary, etc.	do.	do.	do.

PUBLIC APPOINTMENT.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Surveying and Estimating Assistant	London C.C.	300l.	Feb. 24

Those marked with an (*) are advertised in this number.

Competitions, iv.

Contracts, iv. vi. vii. x.

Public Appointments, xvii.

TENDERS.—Continued from page 161.

LONDON.—For the erection of three pair of semi-detached houses, Regent's Park-road, Betate, Finchley, for the Birkbeck Bank. Mr. T. Morrison Garrod, architect, Birkbeck Bank-chambers, W.C. :—	
H. Line	£4,680 A. W. Jagers & Co.
J. Johnson & Sons	4,838 W. of, of Albert's
Read & Wilkinson	4,480 Works, Deptford
C. Wall Ltd.	4,250 and Bromley-by
W. J. King	3,798 Bow*
J. Roberts	£3,240
* Including extras.	
LUTHERIAN.—For alterations and additions to Lutherian Bank, Messrs. Thoms & Wilkie, architects, 46, Reform-street, Dundee. Quantities by architects :—	
Messrs. J. & D. Ross, Newburgh, Fife	£345 0 0
Johns. W. Sulist, Woodhaven, Wornit, Fife	329 17 0
Plumber: D. Brown, South, Tay-street, Dundee	117 0 0
Plasterer: D. Kilgour, 126, Blackness-road, Dundee	68 3 5
Sider: T. Black, South-street, St. Andrews, Fife	50 5 8
MANOR PARK.—For the enlargement of Manor Park School, for the East Ham Education Committee. Mr. R. L. Curtis, architect, 11 & 13, Finsbury-square, E.C. :—	
Almond & Son, Ltd. £8,100	F. & J. Whitcomb
J. Chesnum & Sons 7,700	A. & W. Symes
J. Gregory	7,601 W. Grear & Son
Holliday & Green-wood, Ltd.	7,587 H. C. Horswill
B. E. Nightingale	7,528 J. S. Hammond & Son
Simpson & Co.	7,500 W. J. Maddison
E. J. Carter	7,537 Clarkson-street, Canning Town*
C. North	7,247
J. W. Jerram	7,238

MERTHYR.—For erecting stabling, lofts, etc., with boundary walls and out-buildings, for Mr. S. P. Leyshon, Mr. Arthur Marks, architect and surveyor, Merthyr Express-chambers, Merthyr Tydfil :—

W. Watts £1,435 10 W. C. Jones | £1,247 0 || J. Jenkins | 1,429 0 R. Lloyd, George | 1,180 0 |
| J. Williams | 1,375 0 | town, Merthyr* |
| E. L. Sullivan | 1,259 0 | [Architect's estimate, £1,333 12s.] |

NEWCASTLE-UPON-TYNE.—For new school buildings, for the Governors of the Royal Grammar School :—

S. Fenwick £24,318 18 8 | Watt Bros. || D. & Co. | £30,472 0 0 | A. Pringle |
J. & J.	27,111 0 0	S. M. I. H.
J. L. Milner	26,503 5 0	J. C. Fer-
G. H. Mauch	26,201 1 8	son
J. How & Co.	25,814 8 0	Lid.
T. Weather-	25,664 0 0	& Hodg-
S. Easton	25,351 0 0	Nicholls
W. T. Weir	25,302 0 0	W. Foster
C. J. Hope	25,277 8 11	J. W.
S. Sheild & Sons	25,251 17 1	Co.
S. F. David-	25,228 15 7	T. Hunter
J. & W.	25,108 0 0	Middle-
E. Weather-	25,035 10 0	son
T. Lumsden	24,922 0 0	T. Riley
W. Worley	24,752 1 11	H. Arnold
J. Bewley	24,502 8 2	Son*
Elliot Bros.	24,349 15 10	21,871 13 5

NORTH COWTON.—For house, North Cowton, Darlington, for Mr. W. Fescok. Mr. J. E. Walton, architect, Northallerton :—

Stockdale & Walton, East Cowton* £396 |

NORTH OTTERINGTON.—For alterations to house, for Mr. J. Hutton, M.P. Mr. J. E. Walton, architect, Northallerton. No quantities :—

T. & J. Willoughby, Northallerton* £140 |

RAPHOE.—For additions and alterations to manse, Raphoe, Londonderry, for the Rev. J. Craig Wallace. Mr. J. M. Inlyne, architect, Letterkenny :—

Sons £345 12 0 | Raphoe* | £276 0 0 || J. Baird | £297 0 6 | J. Johnston | £285 0 0 |

SELBY.—For the completion of a Dutch barn at Chester Court Hall, for Messrs. J. & W. Gray, Chester Exchange-buildings, Lowgate Hall :—

Wright & Son £171 18 | Thibnak | £100 0 || W. & J. Oakes | 160 0 | A. Douglis & Co. | £100 0 |
J. V. Oconan	119 10	Ltd. & George	£89 10
D. Dewar	115 0	street, Leeds*	£89 10
T. W. Ward	113 0	do.	do.

SHORNCLEIFFE CAMP.—For erecting a new post-office :—

J. J. Wise £2,206 0 0 | Gann & Co. | £1,774 0 0 || J. Gosby | 2,221 13 0 | N. White | 1,745 0 0 |
F. Nicholls	2,200 0 0	G. Castle &	1,699 18 0
T. L. Fearon	1,990 0 0	G. E. Wallis	1,664 0 0
R. J. Logan	1,949 0 0	& Sons, Ltd.	1,669 0 0
R. Grayling	1,920 0 0	G. Browning	1,450 0 0
T. T. Denne	1,893 0 0	R. Webster	1,450 0 0
East & Hyde	1,852 0 0	do.	do.
& Son	1,850 0 0	do.	do.

SKIPTON.—For erecting a detached residence near Raikes-road. Mr. J. W. Broughton, architect, 19, High-street, Skipton. —
Builder: W. Daggett, Skipton*
Joiner: A. Shaw, Skipton*
Plasterer: P. Hudson, Skipton*
Painter and Plumber: G. H. Mason, Skipton*
Tilers: Thornton & Son, Skipton*
 (Each trade let separately. There were about forty Tenders.)

SOUTHEEND-ON-SEA.—For erection of houses, St. Mary's-avenue West, for Mrs. C. C. Herbert. Mr. C. Cooke, architect, Southend-on-Sea. —
B. Tomkins £1,800
H. R. Wilkinson £1,585
Whur & Campkin £1,700
C. Wingrave 1,375

SOUTH SHIELDS.—For rebuilding business premises, No. 22, Fowler-street, South Shields, for Council J. W. Henderson. Bills of quantities by the architect, Mr. Fred Rennoldson, South Shields. —
J. Young £1,405 0 0
W. Wilson & Sons £1,235 5 0
A. Ross 1,376 10 0
T. Banks 1,268 9 0
G. Thornton & Co. 1,317 8 0
R. Harper 1,212 16 6
Sheriff & Sons 1,300 0 0
W. Allison 1,200 2 1

SUTTON-IN-ASHFIELD.—For erecting Congregational church. Messrs. G. Baines & R. Palmer Baines, architects, 5, Clements-lane, Strand, London, W.C. —
T. H. Kingerle & Sons £4,261 0 0
W. Mawle & Co. 3,612 10 0
Vallance & Co. 4,223 0 0
Blythe 4,179 0 0
J. Greenwood 3,556 0 0
Messers 4,179 0 0
Wood-street 3,556 0 0
Coulson & Lotts 4,080 0 0
Mansfield 3,320 0 0
C. North 3,950 0 0

SWINDON.—For roadmaking, paving, etc., Deburgh-street, Even Swindon Estate, for Mr. James Morrison, J.P. Messrs. William Drew & Sons, surveyors, Regent-circus, Swindon. —
J. William Swindon £395 2 9
 (Four tenders received.)

THORNTON-LE-MOOR.—For erecting new stables, etc., for Messrs. Dover & Newsome Baxter, Ltd. Mr. J. E. Walton, architect and surveyor, Northalorton. Quantities by architect. —
S. Scott, Northalorton £130 19 6

TUNBRIDGE WELLS.—For private street works, Culverden Down-road, for the Borough Council. Mr. W. H. Maxwell, Borough Engineer and Surveyor, Town Hall, Tunbridge Wells. —
F. J. Logan £5,682 15 9
T. Hallett & Son £3,901 19 5
J. Jarvis & Son 3,761 11 5
J. Crates & Son 3,585 1 6
W. Arnold & Son 3,484 5 0
London 3,484 5 0
Sons 4,038 1 8

WALTHAM ABBEY.—For erecting a 25-ft. span road bridge over the Cobbin Brook, near the Green Man, for the Waltham Holy Cross Urban District Council. Mr. W. T. Strathairn, Surveyor, Town Hall, Waltham Abbey. —
L. & W. Patman £520 0 0
A. T. Catley 440 0 0
J. Oram 408 0 0
A. Robbins 394 17 0
Abbey 379 10 0
 (Surveyor's estimate, £400.)

WELLINGBOROUGH.—For erecting Baptist church. Messrs. George Baines & E. Palmer Baines, architects, 5, Clements-lane, Strand, London, W.C. —
Keridge & Shaw £2,640 0 0
A. T. Hawtin 2,460 0 0
C. E. Bayes 2,440 0 0
Goodman & Murkitt 2,400 0 0
H. Green 2,398 0 0
Hackley Bros. 2,379 0 0
R. Marriott £2,375 0 0
O. P. Drever 2,359 9 0
G. Hanson 2,350 0 0
W. Stevens 2,343 6 0
E. Brown & Son 2,300 0 0
Castle-street 2,300 0 0
Wellingborough 2,325 0 0

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VENVOE.—For widening and reconstructing a portion of Twynvrodin-road, for the Llanelly and Dinas Powis Rural District Council. Mr. J. Holden, Engineer and Surveyor, Council Offices, 20, Park-place, Cardiff. —
W. Ball £273 10 3
E. Camond, Great House, Bly, Glam. 303 15 6
H. Ringham 247 11 8

WIGSTON MAGNA (Leicestershire).—For the construction in Aylestone-lane of 156 lineal yds. of 12-in. stoneware pipe sewer, etc., for the Urban District Council. Mr. W. G. J. Clark, Surveyor, Council's Offices, Station-road, Wigston Magna. Quantities by surveyor. —
O. Wright & Co. £338 9 8
A. Palmer, Stimson & Rolliston 275 10 0
Leicester £265 19 9

WINCHMORE HILL.—For the installation of fire-alarms at Northern Hospital, Winchmore Hill, N., for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief. —
Leggatt & Huett £550 0 0
J. Bryden & Sons £310 10 0
Tampin Ltd. 400 0 0
G. Weston & Co. 484 0 0
Sons 298 0 0
J. T. Halsey 463 8 6
Electrical Engineering 295 0 0
C. W. Ware & Co. 450 4 8
Maintenance Co. 262 0 0
R. Melhuish, Ltd. 249 0 0
Leas, Son, & Co. 251 0 0
Private Telephone Installation Co. 297 0 0
Private Telephone Co. 328 0 0
Baxter & Impar 321 15 0
Johnson Bros. 320 0 0
A. H. Marshall 320 0 0
The Broadway, Lawrence, Ltd. 320 0 0
Plaitow, B. £10 10 0

WITHERNSEA.—For remaking High Brighton-street, Withersea, for the Urban District Council. Messrs. Thompson & Kirtson, surveyors, Exchange-buildings, Lowgate, Hull. —
 (Contracts Nos. 1 and 2.)

T. Burrell, Cleveland-avenue, Victoria-street, Hull £138 5

WOODBIDGE (Surrey).—For erecting a new pavilion for scarlet fever, and small additions to administrative block, etc., at the Hospital, for the Guildford, Godalming, and Woking Joint Hospital Board. Mr. E. L. Lunn, architect, 36, High-street, Guildford. —
E. & J. H. Holden £3,816
Martin, Wells, & Co. £3,475
R. Smith 3,556
McC. B. Pitt 3,446
Swayne & Son 3,585
E. Ellis 3,445
T. H. Kingerle & Sons 3,350
Sons 3,581
Tribe & Robinson 3,345
Higgs & Outwaite 3,537
H. C. Hughes 3,330
Crosby & Co. 3,531
Mitchell, Shalford 3,320
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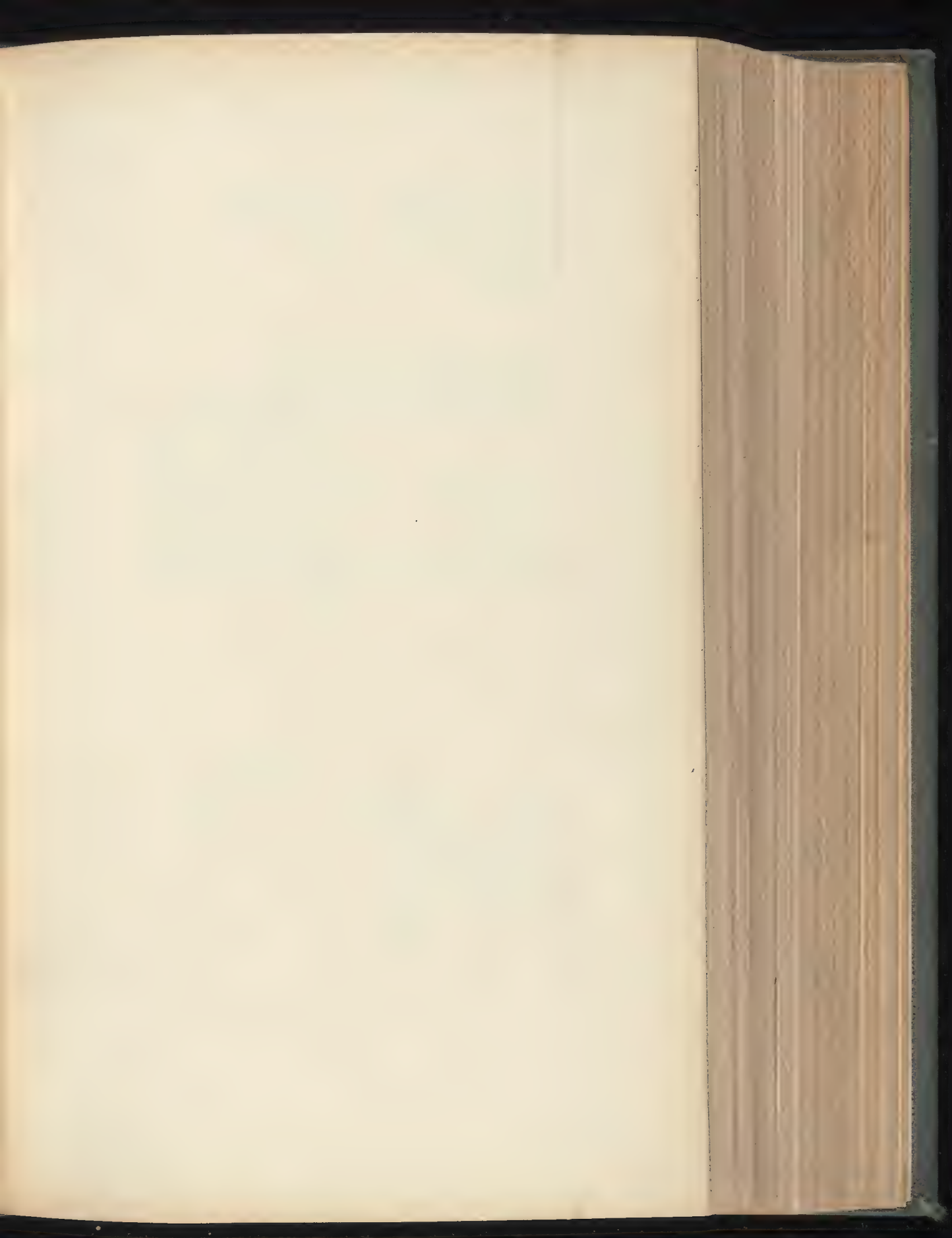
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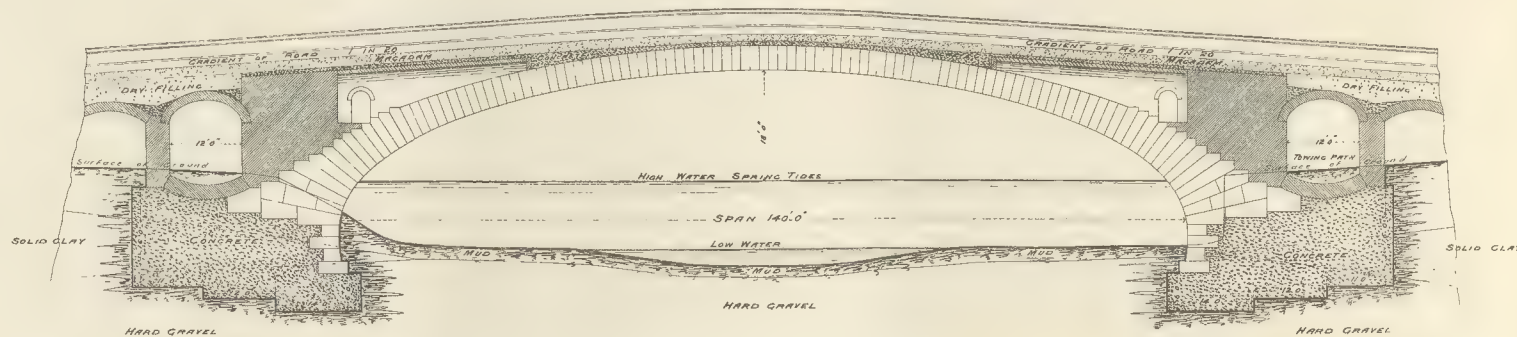
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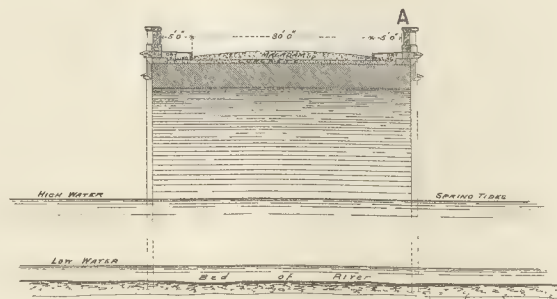


DRAWING NO 3

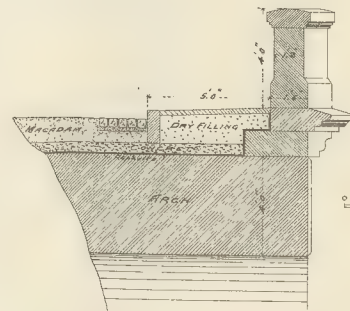
PROPOSED BRIDGE OVER THE RIVER MEDWAY
AT AYLESFORD



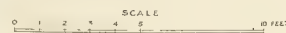
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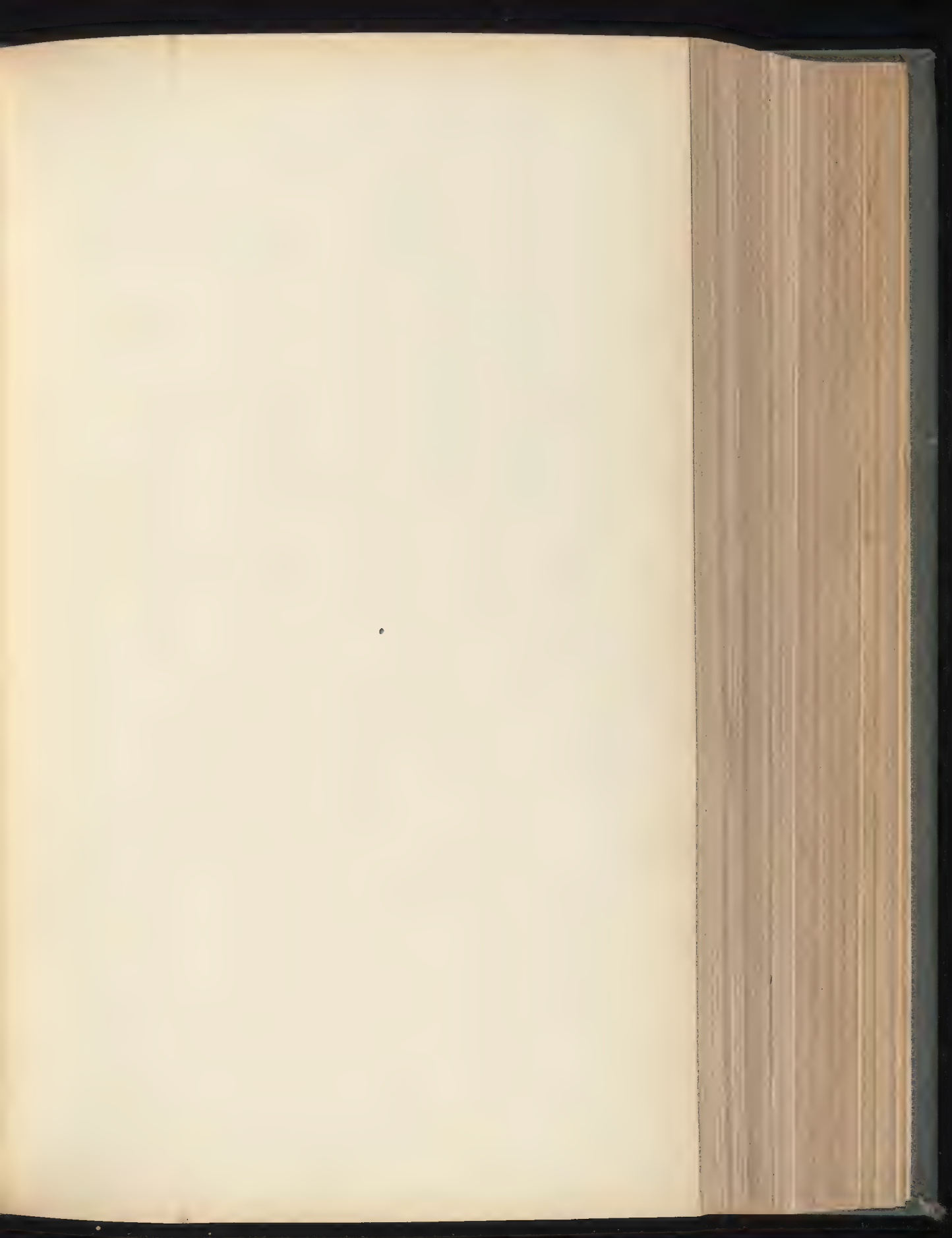
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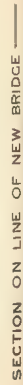


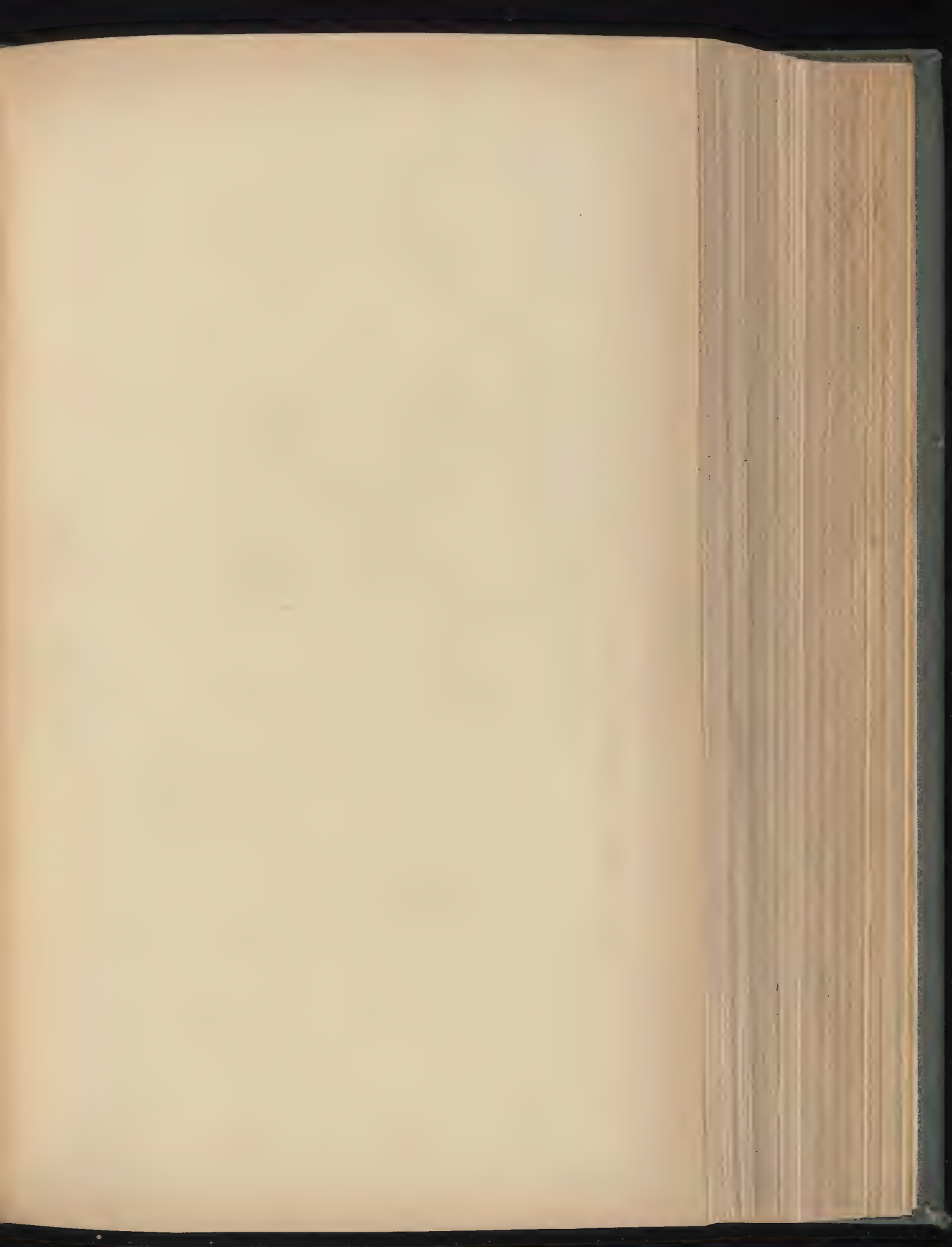
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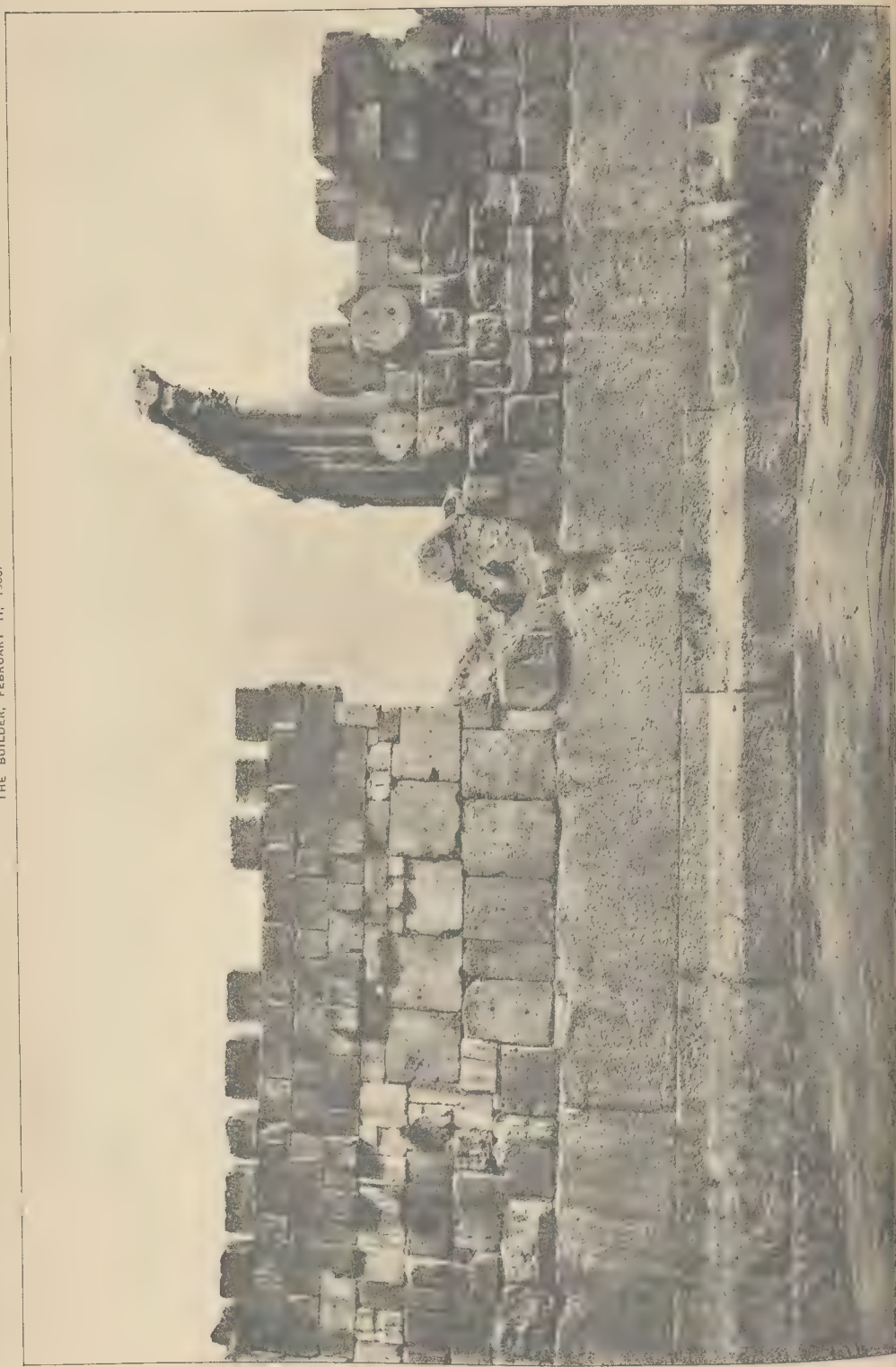
—PROPOSED BRIDGE OVER THE RIVER MEDWAY —
—AT AYLESFORD —

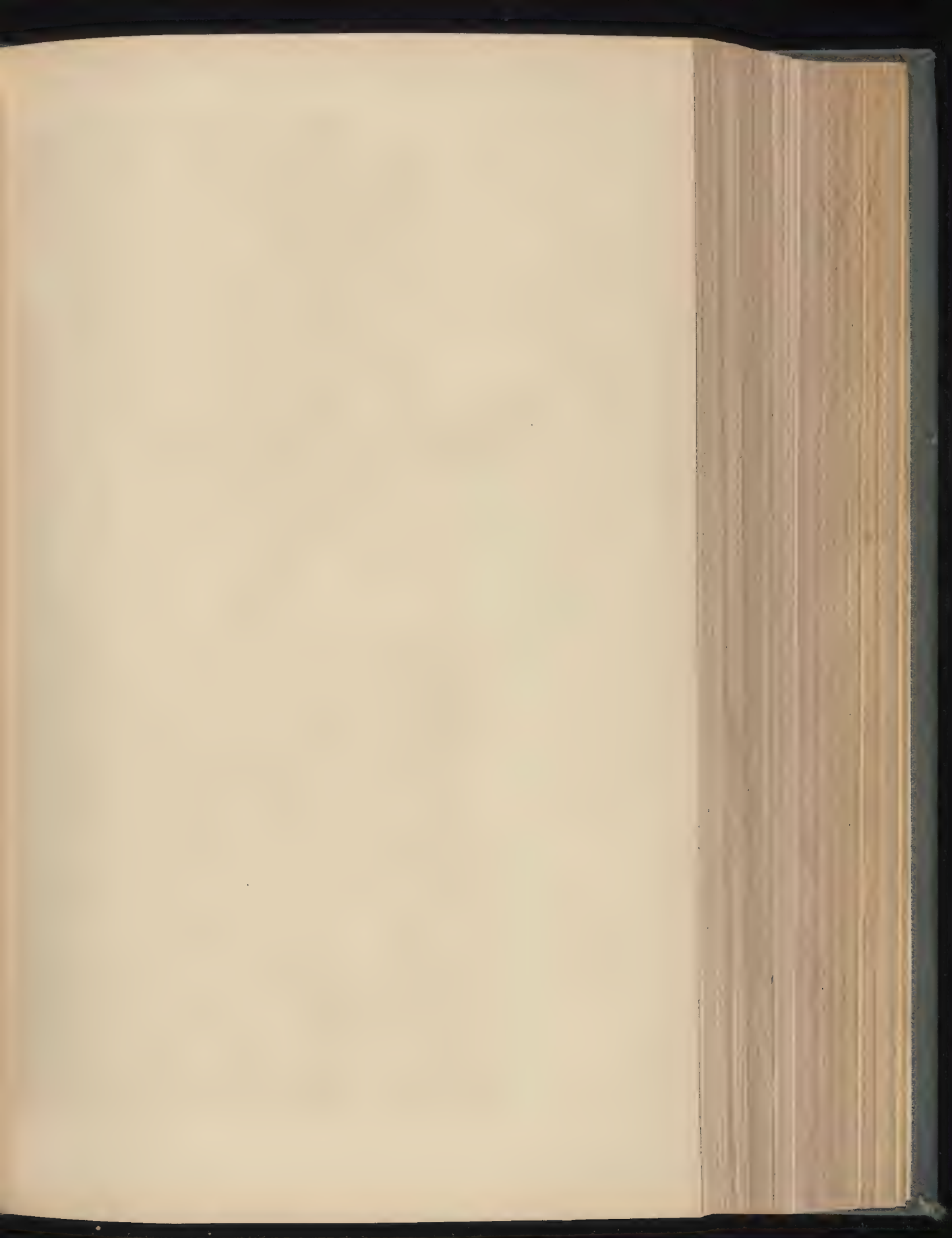
—AT AYLESFORD—

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THE BUILDER, FEBRUARY 11, 1906.





THE BUILDER, FEBRUARY 11, 1905



NEW BRIDGE, BRIDGE, N. Y. 4 & 5 EAST, NEW YORK, N. Y.

BAALBEK. THE GREAT STONE IN QUARRY



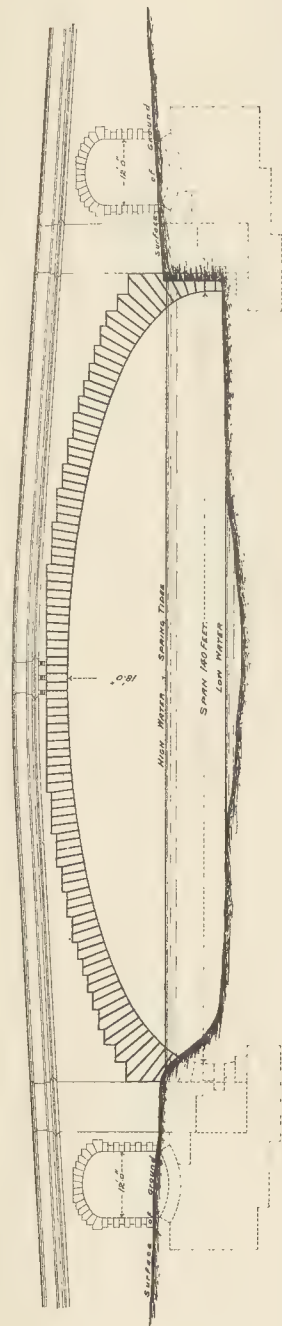
WEST WALL OF ACROPOLIS, BAALBEK THE TRILITHON.



BAALBEK: PART OF THE TEMPLE OF JUPITER

PROPOSED BRIDGE OVER THE RIVER MEDWAY
— AT AYLESFORD —

DRAWING No 2 —



Dear Sir,
 I have the honor to acknowledge
 the receipt of your letter of the
 10th inst. and in reply to inform
 you that the same has been
 forwarded to the proper
 authorities for their consideration.
 I am, Sir, very respectfully,
 Your obedient servant,
 J. H. [Signature]

PHOTO ILLUSTRATION OF A S EASY HADDOCK STREET, NEW YORK

The Builder.

VOL. LXXXVIII.—No. 8237.

FEBRUARY 12, 1905.

ILLUSTRATIONS.

A Lounge and Staircase in a Large Hotel.....	Designed by Mr. Robert Atkinson.
1. Perspective View.	
2. Sections.	
3. Plan.	
Houses, Parkside Gardens, Wimbledon }	Messrs. Hubbard & Moore, Architects.
Houses, Burghley Road, Wimbledon }	
School Bath Centre, Amsterdam.	

Illustrations in Text.

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Architecture and Commercialism:



LONDON is full of the stir connected with the schemes for new buildings which are being put forward and proclaimed aloud on the house-tops or in advertisement columns (which are the modern equivalent for the house-tops of the Old Testament) architectural art, in the true sense of the word, is the last thing that is thought of. The object of those who take up a plot of building land on a new street is, naturally, to make money out of it. We do not blame them for that; but why should it be supposed, as it apparently is, that getting a return for the money is incompatible with the employment of an eminent architect or with any attempt at high-class architecture? We read in papers just now of many building schemes which are or are to be submitted to the London County Council for their approval—schemes for new hotels, new theatres, etc., mostly of immense size and which must have considerable effect for good or bad on the

architecture of London. On what principle or from what causes is it that the projectors of such building schemes almost invariably seem to gravitate towards what may be called the lower intellectual stratum of the architectural profession? Hardly ever do we read, in connexion with these building schemes in new streets, the names of architects who are celebrated as such, who occupy the higher rank of the profession, and who are favourably known in the world of art. There seems to be among building promoters a kind of natural antipathy to and dread of art, or of architecture in its higher sense. When we see the usual enthusiastic paragraphs in daily newspapers (one wonders who furnishes those paragraphs) about some astonishing new hotel or theatre which is to surpass every other erection of its kind in splendour and convenience, we know perfectly well that we shall not see in connexion with it the name of any eminent architect, any member of the Royal Academy, or any one who has an artistic reputation. It is not really that architects of the higher class make a building cost more; but they wish to take time and consideration about it; whereas what is wanted is the kind of architect who will rush the thing through as fast as possible, in order to get at the moment when it will begin to pay a return; and in some cases, too, we believe, the architect is selected on the ground that he is willing to invest money in the building as well as to draw the plans.

It is hardly the way to improve London architecture: It is true that the

County Council is supposed to approve the designs and to have a power to veto them. But we fear this is an influence which does not go a very long way towards obtaining a higher result. The County Council had originally entertained the larger and more spirited idea that designs for buildings on the two most important new streets were to be carried out by one of a list of eminent architects named. This would have secured a higher order of architectural talent being employed on the new London architecture. But those who had proposed this well-intentioned scheme allowed themselves to be bullied out of it by a majority who were either ignorant or who had their own interests to serve.

It is not too late for the London County Council to reconsider its policy in these matters, and to take a higher and more decisive line in regard to the many new additions which are at present proposed (in some cases we might say threatened) to the architecture of London. The proposed French restaurant and garden scheme for the central site between Aldwych and the Strand we should in itself have been disposed to welcome, if well carried out in detail, as it would have secured an open space where it would be very desirable. There seem however to be drawbacks other than architectural connected with it. But the intrusion of monster hotels and other such buildings on prominent sites, regardless of either architectural scale or nobility of style, ought to be checked, or new London will be irretrievably spoiled.

WORKMEN'S COMPENSATION.

THE Court of Appeal has recently had to deal with a heavy list of over forty appeals under the Workmen's Compensation Act, and it is noteworthy that a large proportion of the decisions reported have to do with the building trade. As usual, "scaffolding" takes a prominent place in the decisions. In the case of *Aylward v. Mathews* the respondent was a crane erector, and the applicant was employed by him in the construction of a platform for a crane which was to be used in erecting certain school buildings. The platform, which was 62 ft. in height at the time of the accident, was a wooden structure supported on three legs, which were let into the ground and surrounded by bricks and other material to keep them in place. The legs were connected by cross-pieces, and planks were placed on these cross-pieces, and ladders placed on the planks. Whilst working on one of these legs on a ladder one of the planks supporting it broke, and the applicant sustained injuries. It was contended that a temporary wooden structure such as the above was not a "building" within the meaning of the Act, but the Court, affirming the arbitrator, held that there was nothing to prevent such a structure, whether of wood or not, and whether temporary or permanent, being deemed in fact a "building," especially as in all respects it fell within the purport of the Act. The point is much the same as that implied in the decision in *McCabe v. Jopling and Palmer's Travelling Cradle, Limited*, but in that case the Palmer Company erected the temporary structure on an existing building.

In the case of *Fletcher v. Hawley* a shop was being converted into a restaurant, and the applicant, a working carpenter, was engaged to put up a screen and to fit a lift by the respondent, the owner. At the same time another person was engaged in making a fireplace and a brick chimney, and for this latter purpose this last contractor had erected a scaffolding. This scaffolding was in no way necessary for the work the applicant was engaged upon, although he, as a matter of convenience, did make some slight use of it. The applicant whilst hammering a nail into the screen sustained an injury to the eye. The learned County Court judge held that the applicant could not recover compensation, since the respondent was not an "undertaker" within the meaning of section 7, subsect. 2, of the Act, because by reference to subsection 1 of the same section the "undertaker" must be the person "undertaking the repair, construction, or demolition" of the building "by means of a scaffolding." The Court of Appeal did not agree with this view, but held that it was not material whether the undertaker upon whom the claim was made had put up the scaffolding, since all that the Act requires is that there should be a scaffolding by means of which an operation of construction, demolition, or repair is being carried on. The Court pointed out that the fact that the applicant made some use of the scaffolding sufficed to bring the case on all fours with *Mason v. Dean*, decided in 1900, but it is

important to observe that this decision is not confined to that fact. As it has been already decided by the Court of Appeal in the case of *Maude v. Brook* that the accident need not be connected with the scaffolding (see also *Brindle v. Jones, The Builder*, April 16, 1904, p. 116), and by the House of Lords in *Hoddinott v. Newton Chambers* that the word "scaffolding" only serves to form an artificial line of demarcation between buildings within and without the scope of the Act, the above decision appears the only logical conclusion the Court could arrive at.

In the case of *Hartley v. Quick* the old difficulty occurred of determining what constitutes a building of over 30 ft. high—a question which has caused so much litigation that the Departmental Committee recommended this limitation being altogether abolished. A contractor was employed by the Portsmouth Corporation to erect a building which when completed was to form part of an already existing electrical generating station. The original station exceeded 30 ft. in height. The trenches for the footings of the new building had been got out, and in places some part of the walls had been carried up 20 ft. No part of the new building had been connected with the existing building, but the footings had been got in right up to the old building. The applicant whilst working on the new building sustained an injury. The County Court judge had held that if the two buildings were ultimately to form one building or to form two buildings to both of which an existing party or other wall either was, or was intended to be, common, so long as building operations were being carried on in connexion with both buildings, then both were within the Act. The Court of Appeal affirmed the finding that in the circumstances of this case the man was employed on or about a building exceeding 30 ft. in height, since the new building was really an extension of the old one and the work was being carried out by the owner of both; but it is important to observe that the Court especially excepted the cases where an independent owner was erecting an independent building involving some use of a party wall. The contractor was the actual respondent, but this fact made no difference as regards the propositions above stated.

The case of *Coles v. Anderson* raises a somewhat novel point turning on the definition of an "engineering work," which includes "any work of construction, alteration, or repair of a sewer." The respondent was a contractor who had contracted with the local authority to connect a drain leading from a private house with the main sewer. The owner had constructed the drain from his newly-erected house to the edge of the footway, and one of the contractor's workmen was engaged in preparing a trench in which the pipe was to be laid connecting that drain with the sewer. Before the trench had reached the sewer or the sewer had been touched he met with an accident which resulted in his death. The Court of Appeal, reversing the finding of the County Court judge, held that employment "on, in, or about an engineering work" included the work done for the

purpose of obtaining access to the sewer as well as the actual work of making the alteration in the sewer itself.

In the case of *Castle Spinning Company, Limited, v. Atkinson* a point of practice was decided. The employers, who had been paying an injured workman weekly compensation for some time, applied under paragraph 13. of the first schedule of the Act for a review of the weekly payments, and also in the alternative for their redemption by payment of a lump sum not exceeding 150*l.* The Court of Appeal held that this attempt to limit the amount to be paid on redemption of weekly payments in effect introduced a new term into the Act and could not be supported. As we have had occasion to observe before, so far the power given by the Act to employers to redeem their weekly payments by a lump sum has proved a dead letter, as the basis of computation adopted by the Courts has been the actuarial value of the weekly payments. The Departmental Committee inclined to the opinion that a maximum limit, say of 500*l.*, might be fixed for commutation of weekly payments, and this would certainly tend to make the Act more workable.

It only remains to note two cases on what is a "workman" within the meaning of the Act. In the case of *Simpson v. Ebbw Vale Steel, Iron, and Coal Company, Limited*, for the first time a claim was made under the Act in respect of a person occupying a superior position. The claim was made by the widow of the certificated manager of a colliery whose salary was 400*l.* per annum, paid monthly, and who had a house found for him and house coal also free, and who had met with his death in the mine by an accident. By section 7, subsect. 2, of the Act a "workman" is defined to be "every person who is engaged in an employment to which this Act applies, whether by way of manual labour or otherwise, and whether his agreement is one of service or apprenticeship or otherwise, or is expressed or implied, is oral or in writing." The Court of Appeal, whilst commenting on the unhappy definition as contained in the Act, have, by reference to the general tenor of the Act, and especially to the limit placed on compensation and the words "workmen" and "wages" in other connexions in the Act, excluded the applicant in this case. Lord Justice Mathew held that it applied only to workmen paid by weekly wages. Another form in which the question "What is a workman?" arises is when it has to be determined whether a man is a workman or an independent contractor. In *Clasper v. Commercial Gas Company* the applicant was employed by his father, a slater, who had entered into a contract with the respondents to take off a roof and repair it, being paid 7*s.* 6*d.* per square yard for the tiling work and the rest by time. The contractor was to engage the necessary men for the work, the same to be paid by the respondents according to the nature of the work they were engaged upon. The applicant whilst working at work to be paid by time met with an accident, yet the Court of Appeal held that he was the servant of his father and not of the respondents. The Departmental Committee made no recommendation on this

subject, yet the cases seem difficult to reconcile. The Committee appears, moreover, to have considered the case of Evans v. Penwyllt Dinas Silica Brick Company (decided in 1902) as determining the position of "buttymen" in mines and quarries who provide the labour and are paid by piece work, but this can hardly be maintained, since in that case the man had made a special agreement with his employers that he was to be entitled to compensation in the event of accident.

NOTES.

REFERRING to our "Note" last week on "American Railway Accidents," we may remark that the Blue-book now issued by the Board of Trade shows that the number of accidents to passengers from all causes during the three months ending September 30, 1904, includes only 33 fatalities and 757 cases of injury, and it should be noted that accidents to trains, rolling-stock, and permanent way were responsible for the injury of only 173 passengers, none being killed. Although it would be unfair to base any definite comparison on these figures, they clearly indicate a very different state of things from that prevailing in the United States. Taking the statistics for the year 1903, and making due allowance for the fact that the railway mileage of America is ten times that of this country, we find that about sixteen passengers are killed in the United States for one passenger here, while the numbers of those injured are in the ratio of about seven to one respectively.

THE figures in the foregoing "Note" are distinctly reassuring, and the careful inquiry made by the Board of Trade into the cause of every mishap is a valuable safeguard to the public. The report of Colonel Yorke on the Llanelly accident is a sufficient illustration of the latter point. This mishap was caused by the derailment of a train running at 50 miles an hour, and it is shown by the evidence that the leading engine, one of the tank type, was the first to leave the rails. We quite agree with the opinion of Colonel Yorke that this useful form of locomotive is unsuitable for high speeds, as, owing to the arrangement of the wheels and weights, dangerous oscillation is most likely to be established. The recommendation that the companies should appoint an expert committee to inquire into the behaviour and suitability of different engines for various speeds and classes of work is an excellent one, which we hope will be adopted without delay.

EXAMINATION of Ordnance bench marks from time to time shows, generally speaking, a subsidence in some parts of the country, most invariably in mining districts. Of course, the level of individual bench marks is affected also by purely local circumstances, such as the settling of supports in the soil, but we now refer to an appreciable sinking of levels throughout an entire district, as appears to have happened at Sunderland. In 1884 a well-known resident on the outskirts of that

town announced that, as the result of observations extending over some years, he believed the site of his house had sunk bodily. This opinion was verified a year later by the comparison of levels taken by an architect, Mr. Frank Caws, with those of the Ordnance survey made thirty years before. In 1895 the North-Eastern district was re-levelled by the Ordnance surveyors and the levels of the Sunderland bench marks were then found to be lower than those taken by Mr. Caws in 1885, the differences ranging from a few inches to as much as 6 ft. Finally, in 1900, a second survey was made by Mr. Caws, and the results of this showed that the gradual subsidence of the town still continued. Local geologists have suggested that the site of Sunderland is gradually sliding into the sea, but we are more inclined to the belief that the continued lowering of the levels is due to mining operations. This view is confirmed by the general experience of the Ordnance survey, and by the fact that as a rule subsidences are not more marked on the sea coast than at places inland. It may be added that general subsidences are rarely, if ever, observable in purely agricultural districts.

WHEN an engineer is about to repair or to do any work requiring the disconnection of a steam pipe, a water main, or an electric conduit he is first careful to shut off the source of supply. Plumbers always follow the same rule in connexion with steam and water pipes and with electric-light wires. They generally do the same in the case of gas pipes—that is, if they are careful men. Unfortunately, some of them seem to presume upon the circumstance that the escape of a little gas will not scald, wet, or cause any direct inconvenience to the operator like steam, water, and electricity. The gas pipe is disconnected, and the optimistic plumber tries to plug or cap the end of the supply pipe without troubling to shut off the main cock, or it may be that, having shut off the supply while disconnecting and stopping the end of a pipe, he afterwards tries to replace the plug or cap by a permanent fitting at the end of a close pipe when the gas is on. In either case his misplaced confidence may not be justified by subsequent events. The explosion in Bloomsbury a few months ago and the more serious explosion last week at the Central Railway station, Glasgow, sufficiently prove the folly of trusting to good fortune when dealing with gas pipes. At Glasgow four men were seriously injured and about 100 ft. of a solid concrete platform was blown up. It is simply amazing to think that such risks are run merely to save the trouble of turning a cock.

Overhead Mains.

MR. G. L. ADDENBROOKE read a paper on "Overhead Mains for Electric Distribution" to the Institution of Electrical Engineers last week. This method of transmitting power, although used extensively abroad, has been practically prohibited in this country until quite recently. The lecturer had an easy task in proving how much more economical overhead mains would be than the present system of underground mains. He showed that for the same capital cost the power

companies could supply at least three times the area if they used the overhead system. As a compensation for the unsightliness of overhead mains, he mentioned that they would be the means of abolishing much smoke and dirt and heavy coal traffic on the roadways. By bringing a convenience of town life, also, into the more open districts, they would be an aid in repopulating the country. It was stated that one of the most desirable objects at the present time was the extension of tramways into the country, and, more particularly, the construction of inter-urban tramways. The permission to erect the required mains on poles, as in the United States, would enable many tramway companies to extend to much greater distances than they can at present. By simply painting the poles green or grey, it was stated that they could be made very unobtrusive. In discussing whether the supply of power by overhead mains was trustworthy or not, the lecturer was more convincing. He pointed out that towns like Rome, Berne, Milan, Buffalo, etc., had been dependent for many years on electric energy supplied over distances varying from fifteen to thirty miles by overhead mains, and, with the exception of difficulties in connexion with lightning arresters, which had now been overcome, the service had been entirely satisfactory. Practically no difficulties had arisen from wilful damage, as people abroad had a wholesome dread of shocks. The paper is a timely one, and there are, no doubt, cases where the use of overhead mains might be permitted with advantage to the community.

The Weight of a Crowd.

IN the current issue of the *Proceedings of the American Society of Civil Engineers* Professor Johnson presents some additional data which surpass the results previously given by him and quoted in our "Note" on p. 82. In the later experiments forty students with an average weight of 158.8 lb., assembled in the test chamber, resulted in the load of 176.4 lb. per sq. ft. Then forty men weighing 163.2 lb. each were put in the pen, with the resultant load of 181.3 lb. per sq. ft. We are told that the latter lot were "all undergraduate students of engineering," but it is quite probable that architectural students would have acquitted themselves equally well. From figures obtained by Dr. Sargent, of Harvard Gymnasium, with the aid of a planimeter, it appears that the cross-section of a man standing 6 ft. 3 in. high may easily reach 117 sq. in., with a corresponding weight of 177 lb. This gives 218 lb. per sq. ft., which can be regarded as the maximum unit load of a crowd. In view of the photographs and data now before us, it is impossible to avoid the conviction that live loads of 170 lb. per sq. ft. are by no means unlikely, and that loads of from 130 lb. to 140 lb. must often occur in crowded buildings. Further, as Professor Johnson points out, the careful designer will remember that 180 lb. per sq. ft. is well within the range of probabilities.

Pictures by M. Le Sidaner.

AN exhibition entirely of pictures by M. Le Sidaner might be expected to be somewhat monotonous, for he has been

known so far as the painter of one effect, that of old buildings painted as if seen through a mist. The collection of his works at the Goupil Gallery shows, however, a little more variety than might have been expected; and in one work, "Mon Jardin" (25), which is the more effective from its contrast with the style of the others, he shows that he can, when he chooses, paint a bright and true effect of open-air daylight. He is a very gifted artist, and if he can only shake off the trammels of his particular mannerism he may do great things. Among the works in this exhibition that have a special charm, besides the one already mentioned, are "Impression de Bruges" (1), a study of a girl's head with a dim background of city scenery just indicated; "Les Lampions" (5), a study of the effect of Chinese lanterns in a grey twilight; "Barques de Pêche, Coucher de Sseil" (3) and "Canal à Bruges" (6), two very effective scenes in warm and in cold light; "Le Petit Pont de Fer, Gisors" (19), a remarkable piece of colour where a green-painted iron bridge spans a dark moat over-hung by trees; "L'Automne" (22), a river scene also very fine in colour; "L'Escalier" (28); "Le Petit Pont Blanc" (29), where the old houses are very effectively treated. The artist is not so successful in architecture of a more important class; in his "Chartres" (16) the cathedral is badly drawn, and in "Beauvais" (12) the cathedral fails to show its scale through not being sufficiently set back in perspective from the small house in the foreground. The trick of effect of indicating lights in the windows of a building in an otherwise grey twilight scene is repeated over and over again; it is a very cheap trick, easily imitated by artists of far less ability. The large decorative picture entitled "Le Printemps" (13) shows the artist in a new light, as a painter of figures, which however are rather stiff, though the composition is pleasing as a whole.

The Leicester Gallery. THE collection of small works by Mr. Austen Brown, Mr. Cameron, and Mr. Coutts Michie, at the Leicester Gallery, though very unequal, contains some things of great interest. Mr. Brown's "Master Baby" (1) is a bad beginning, for it is a baby whose face is not modelled and whose eyes are only blue dots. There are some interesting though rather rough landscape studies, but the eye is caught at once, at a distance, by one small work—"Potato Harvesting, October evening" (8), which one at once recognises as a real picture in the full sense of the word; one of those inspirations in composition the charm of which cannot be defined in words. Mr. Brown should work this out into a large picture; it has the makings of a great work. Mr. Cameron's style as a painter is heavy and sombre, he is essentially a black and white artist; but "St. John-street, Stirling" (20), is a powerful composition. Mr. Coutts Michie's landscapes include two very fine things, "The Last of the Harvest" (25) and "A little Farm" (27); the style is rather too "vigorous" and there is little indication of detail, but for composition and aerial effect they are admirable. "Romance on a Haystack" (31) is a

pretty sketch of two children seated on the top of a haystack in the foreground of the picture, but the perspective lines of the landscape do not give the idea of a foreground elevation sufficient to account for such a very high horizon as the picture shows.

Dudley Gallery Art Society. THE forty-first exhibition of water-colours by the Dudley Gallery Art Society consists very largely of the kind of works which represent a certain formal excellence in water-colour painting without any distinctive character. Drawings like Mr. Hereford's "St. Michel, Normandy" (8), and others remind one too much of the kind of art which Rowbotham's and Richardson's works in the Society of Water Colours used to represent a good many years ago; works in which foreground and distance seemed to be pre-arranged on a received system of colouring, always with a harmonious and pleasing effect, but an effect of the atelier rather than of nature. Mr. Sylvester Stannard's larger and more ambitious subjects in the present exhibition have the same defect; they look like made-up effects. The best things in the gallery are among the more slightly executed works in which we find breadth of style and an original conception of colour and composition; as in most of Miss Margaret Bernard's drawings, Mr. Wells's "A Moorland Stream" (91), and Mr. A. Stevens's "Early Morning at Sonning-on-Thames" (146). Miss Rudd's two small views at Richmond, Yorkshire (47 and 58) show originality of style. Among others we may mention various works by Mr. G. Marks; Mr. Coleridge's "Thames above Windsor" (234) and "Worn-out Vessels at Rye" (242); Mr. Duassut's "Old Cottage near Badon" (246) and "A Wiltshire Cottage" (253); Mr. Stormont's "A Sand-built Ridge" (78); Miss Jex Blake's "Meadows between Winchester and St. Cross" (164); Mr. David Green's "Thursley Common" (168); Sir W. Eden's little sketch of "Pisa" (178); Mr. Dixey's "Spring-time, Wargrave" (232); Mr. Roscoe's "A Village Street" (240); and Miss Martineau's "The Captain's Road" (280). Architectural subjects are neither largely nor very well treated in the collection; Mr. Donisthorpe Donne has a careful but not very effective drawing of "Saracen Architecture in the Temple Enclosure, Jerusalem" (5); Mr. Berenger Bengier illustrates "The North Door of St. Mark's" (154); and Mr. Mildmay exhibits a picture of "Santa Maria della Salute" (123) in which that rather too celebrated building is worse treated than we have ever seen it in painting.

The Modern Gallery. THE gallery under this title has changed its home for the better, and its address is now at 61, New Bond-street. The old rooms were very deficient in day-light, and the change to the two well-lighted ground floor galleries at No. 61 is in every way an advantage. The new gallery is at present filled with a collection of paintings by Mr. Andrew Colley, a clever follower of the most modern French school in painting, to which he brings a degree of talent which might have been better employed in another

and better manner of painting. His scenes in Venice are the best things in the collection. "Towards the Lido" (8) is a powerful piece of open air effect and sunlight on water; but, as in so many landscapes of this school, the same texture runs through everything—water, buildings, and sky; the mooring posts in the foreground are there in perspective position, but do not stand out from the background and the water as they would in reality. In "Grand Canal, Venice" (26) there is a brilliant effect of reflected light on the water, which seems to flash in your eyes, but everything else is sacrificed to this. There are very good compositions among the landscapes, but they are not like nature; they do not give the impression of nature; they are arrangements of paint only; and the one called "An Old House, Laren" (15), is simply a kind of paint-pie, colour planted all over the canvas in streaks and ridges. Does anyone see nature like that? If so, his optic nerve must be diseased. That there is a great deal of ability in these pictures we admit; but it is ability misdirected, and the result gives us little pleasure.

MAGAZINES AND REVIEWS.

THE *Art Journal* contains an article by Mr. J. D. Crace on "Painted Decoration," in which the subject is treated with especial reference to the relation of such decoration to the architecture. The principle which Mr. Crace lays down is that the quality which most makes for dignity and beauty in architecture is repose, which quality comes of a sense of firm and well-balanced stability; whence it follows that an colour used in beautifying the interior of a building must be used in such a manner as to emphasise the appearance of stability, by adjusting the value of the colour to its proper position in the scheme of expression. And he divides buildings into two classes, those which possess strongly marked structural features in the mouldings of the architecture, and those which, like the Sistine Chapel and the Arena Chapel at Padua, are nearly destitute of such features and are empty shells until the decoration is applied to them. He suggests, and we quite agree with him, that Giotto took the right course in giving strength to the system of decoration by dividing off his paintings with strongly marked bands of ornamental borders which suggest structure, while Michelangelo painted apparent architectural features where none existed; certainly a totally false principle of decoration. The Sistine Chapel is a ciple of decoration, but not an example of a great set of paintings, but not an example of a true decorative scheme. As to buildings which are already marked by boldly modelled architectural features in relief, we very sparingly felt that colour ought to be very sparingly applied to moulded surfaces, to bring out one member or to throw back another; for mouldings tell by contrast of light and shadow; to colour them strongly and over their whole surface is apt to destroy the light and shadow effect, as the strong colouring in some mediæval churches, when it was new, must certainly have done. Mr. Crace does not press this point, though he does say, in a general way, that in that case the painter's first duty is to be ing, and that no part of such a building is to be looked at as a mere canvas for his subject, or a frame for the work he exhibits there. The article is a very thoughtful and considerate one, and should have the attention of those who are concerned with the decoration of buildings. The frontispiece to the *Art Journal* is a good reproduction of Gainsborough's beautiful portrait of the Hon. Mrs. Graham.

In the *Burlington Magazine* is a valuable article by Mr. Lionel Cust on "Paintings by Lucas Cranach," being No. 6 of the articles headed "Notes on Pictures in the Royal Collections." Miss Cartwright's article on Drawings by Millet in the collection of the late Mr. J. S. Forbes is accompanied by some fine reproductions of portrait heads by Millet, among which that of Théodore Rousseau is

particularly interesting, though we cannot help thinking that the hand (which is raised to the forehead) is rather too small in comparison with the head. His portrait of his second wife, with its lead, is also a fine study, with a suggestion of Rembrandt about it. Mr. Jourdain concludes his articles on the lace collection with a chapter on "Milanese of Mr. Blackmore" which is a study in lace. The style of the examples given does not go to recommend this school of lace; it is too open and too ragged in line. Mr. Clouston, in his fifth article on "English Furniture Upholsters and Cabinet-Makers," which publishes in parts a book entitled "Upwards of One Hundred New and Genteel Designs." Mr. Clouston does not deny that the book is "full of artistic failures"; and if the designs illustrated are fair specimens of the whole, we cannot be surprised at the comment. The only good one is the Desk and Bookcase which forms illustration No. 6; and that is good rather in a negative than a positive way, being simple in its lines and avoiding the gimcrack ornaments of the other designs.

The *Art-Workers' Quarterly* includes among its articles on methods of working one on "Chasing and Embossing on Metal," by Mr. John Williams; "A Lesson on the Making of Honiton Lace," by Mr. L. A. Reynolds; and one on "Tuchon Lace," what this manner of lace is we do not profess to know. Mr. E. F. Strange contributes the first of a set of articles on "Ornamental Lettering," dealing in this article with capital letters, of which some old examples are given, which however are more remarkable for elaboration and richness than for real beauty of line. There is an article on some furniture made by Mr. A. Romney Green, with a short profession of his faith by the artist, from which we quote the following remarks, with which we are completely in agreement; they bear especially on the question of mechanical work and repetition of designs:—

"During the progress of a work of art a hundred opportunities occur, suggested sometimes by the idiosyncrasy of the material, sometimes by the happy inspiration, or even by the mistakes, of the craftsman, for improvements on the first conception, for just those fine individual touches or masterly touches which make clear the whole difference between success and failure. A detailed and complete design, that is to say, will seldom be easily carried out even once by a true craftsman; never, except under compulsion, a dozen or a hundred times. That any design should be exactly and often repeated means not only the vulgarisation of that design; it means a loss to the craft of those individual touches and slight variations which are necessary to the evolution of the fittest types and the building up of a sound tradition. To the loss in this way of our tradition in furniture making must be mainly attributed not only the badness and ugliness of our modern trade furniture, but the very imperfect results that have yet been achieved even by the handicraft movement. In no art as a good tradition be completely established or revived by the efforts of one generation; but it is something to know that we are already making progress in the right direction."

A dresser for an angle position, designed by Mr. Curtis Green, shown on page 19, is a very good piece of solid and characteristic work, and Mr. Romney Green's chair (page 29) is admirable. It is necessary to name the pages, as the illustrations are mostly scattered about without reference to the text, according to an irritating habit, prevailing in more than one modern artistic journal.

In the *Berliner Architekturwelt* the building for the Royal Land and Estates office (that we take to be the meaning of "Land-und-Amts-Gericht") in the Neu Friedrichstrasse is a curious building in a kind of very corrupt classic style which it is impossible to label exactly; we do not complain of it on that account, however, but the detail is bad and tortuous and the whole thing too confused, though it is not without a certain impressiveness. Herr Otto Schmalz is the architect. The Victoria-Luisenschule at Wilmersdorf, by Herr Herrning, is a curious combination of mullioned Gothic windows with modern Romanesque; the result is original but not captivating. The best thing among the illustrations is a large bowl or centrepiece, of architectural character, probably silver, on opposite sides two nude female figures lean in graceful attitudes against the rim, back to back, supporting themselves on their hands placed behind them on the rim. This is the work of a sculptor, Herr Otto Richter, of Berlin. We also notice among the furniture designs some things designed by an architect, Herr August Endell, for a private house in Berlin, of which the dining-room and bed-room pieces, with their severe lines and bits of inlay, are very good, and show the simplicity of character which is too often wanting in modern German furniture.

A technical review called *Concrete and Steel** has recently appeared in Germany in a new form as a monthly paper, with the sub-title of "An International Organ for Concrete Building and for Progress in Construction and Building." The paper is edited by Dr. Ing. Fritz von Emperger, and published by Wilhelm Ernst & Son, Berlin. In an introductory notice the editor explains that the review "will now embrace a larger field of activity, and take concrete building in general under survey. It is to a large extent the successes achieved with concrete-steel that have given impulse to the energetic striving after progress in other branches of building and construction. All such matters will be discussed here, but particularly those that come under the name of 'concrete.' In this way *Concrete and Steel* hopes to enlarge the circle of its readers, at the same time attaching more surely to itself all old friends and contributors." The present number contains an article by the editor on "The History of Concrete-Steel in Belgium," a long article on "The Streets of the Future," an account of "New Methods of Laying Foundations," besides other articles and reviews, etc.

The *Architectural Record* (New York) has an article, by Mr. Chas. de Kay, on "Villas all Concrete," from which we gather that the American mind is beginning to rebel against the "shingle" house, unpainted and unstained, but left to weather into colour. It is admitted that it does sometimes take a delicate and picturesque colour, but in other cases its effect is said to be dull, and there is a longing for something brighter, and this is being sought for through the introduction of concrete cottages with cement or stucco facing. Judging from the illustrations, it would seem that some of the American architects have contrived to treat this kind of cottage in a very picturesque manner.

Techniques contains an illustrated article by Mr. Harold Busbridge, on "Some Common Defects in Timber, and their Causes." Of course, as the author points out, many features of wood regarded as defects by the timber merchant are the natural result of the growth of the tree. Some of these can be avoided by careful selection, and others may be removed entirely. The first group of defects considered includes such as are due to pith, sapwood, and knots, and although these cannot be altogether eliminated, the extent of the first two can be materially reduced by selecting healthy and well-matured trees for felling, and large knots can be prevented from forming to some extent by lopping off branches and shoots from the stem when the trees are young. Other defects, not essential features of a healthy tree, include shakes and "decayed-heart," due to old age, and other forms of shake consisting in the partial or entire separation of annular rings of wood, the origin of these. Decayed knots and "rind-gall" are faults which generally result from mechanical injury to the tree, but transverse shakes, found chiefly in foreign hard woods, and spiral growth, are defects over which no control can be exercised. "Wandering heart" and "inbark" conclude the category of defects, some of which are common and others comparatively rare. Nothing can be done by the architect or builder to prevent any of these, and his care must be to avoid timber in which they exist, a task requiring knowledge of the kind conveyed in this article. Mr. Bryson Cunningham, B.E., A.M.Inst.C.E., has a useful contribution on "Mortars and Cements," dealing briefly with lime mortar, cement mortar, Portland cement, and Roman cement. After reviewing the chemical and devotional aspect of the subject, the writer deserves attention to the adaptation of mortar and cements to practical purposes. Two interesting curves show the compressive strength of mortar consisting of 3½ parts of hydraulic lime and 5½ parts of ashes, and the increased strength of such mortar when hardened in water. Another noteworthy curve on the same page demonstrates the fact that ash mortar is considerably stronger than mortar of the same proportions, in which 1 part of the ashes has been replaced by sand. Taken alone these curves may give rise to erroneous impressions as to the comparative resistance of ash and sand mortar, and they would be more useful

if supplemented by a third curve, giving the strength of sand mortar mixed in the proportions mentioned. The article concludes with some notes on the testing of Portland cement, and a brief reference to Roman cement. "Recent Gas and Oil Engine Devices," by Mr. Thomas Holgate, M.Inst.C.E., is merely a series of descriptive notes on some internal combustion motors, exhibited at the Earl's Court Exhibition. These engines show generally that development is proceeding along the lines of higher compression, more convenient means of ignition and starting, and, in large engines, of water-cooling for the exhaust valves. Advances in such directions have undoubtedly brought about considerable economy in fuel and greater uniformity of power generation. Several electrical subjects of indirect interest to our readers are treated in the present issue. Among these we may specially mention one on "Boosters," by Mr. Harold H. Broughton, the booster being a machine applied to raise the voltage in electrical circuits for feeding purposes, and also for balancing the potential in three-wire systems for the distribution of current. The diagrams in this article incidentally make clear the principles of the two-wire system, which, somewhat curiously, is seldom explained so fully as might be desired in textbooks on electrical engineering. Further instalments are given of the serial articles on "The Electro-Magnetic Theory," by Mr. Edser; "The Elements of Chemical Engineering," by Dr. Grossmann; "Insulation and Insulators," by Mr. Symons; and "Electro-Chemical and Electro-Metallurgical Industries," by Mr. Kershaw.

The *Quarterly Review*, a very good number in a literary sense, we must pass over with this general compliment, as it contains no article on any class of subject that comes within our province.

Macmillan contains an article on the subject of "Art and the Athlete," by Mr. Martin Hardie, the theme of which is that "we are an athlete nation, but we have no athletic art"; no art, that is to say, which makes a study of representing the human being in the full strain of an athletic action. There are some exceptional instances. Mr. Henry's "Youth" was in a sense an athletic picture; and we have seen at least one picture of an eight-oar in full swing. We have never seen a good picture drawn from cricket, football, or golf; lawn tennis has had its painters, but then there is the question—is lawn-tennis in the true sense "athletic"? Mr. Hardie complains that our sculptors make no attempt at the kind of thing that Greek sculptors did in their day and with their athletes, maintaining that golf and football present just as effective attitudes as some of those of celebrated Greek statues. So they do, but it is that troublesome question of costume again; the Greek sculptor had his athlete nude. In the case of cricket we can imagine a fine statue being made of a fast bowler in the full swing of his delivery. The batsman does not lend himself so well to artistic treatment; the bat is an awkward instrument for sculpture. But the subject is worth serious consideration. Mr. Hardie thinks there would be more attention paid to athletics in sculpture if the sculptors were athletes. He seems to have been looking them up in *Who's Who?* and mentions five of the most eminent of our sculptors who have "no recreation," and two others who own to nothing more strenuous than singing, bicycling, and gardening. Greek sculptors were certainly more in touch with the athletic life of their day than ours are, but it must be remembered that the life itself was different, and lent itself better to artistic treatment. There ought however to be more effort at the sculptural treatment of athletics than there has hitherto been, and Mr. Hardie may have done a service in calling attention to the subject.

The *Century* gives a colour reproduction of a fresco recently discovered at Pompeii, representing the origin or founding of Rome. It is described in an article by Professor Ettore Pais, the present Professor of Ancient History in the National University of Naples, but formerly Director of the Naples Museum, and who discovered the fresco. It is a mystical landscape with a small temple at the top of a hill. Mars and the chariot of the sun appear in the story; a figure slumbers on the ground near the temple; at the foot of the hill are seen Romulus and Remus and the wolf. Hermes points them out to another figure, a goddess of

* "Beton und Eisen." Internationales Organ für Betonbau, neuere Bauweisen und Bauwerke. Herausgeber, Dr. Ing. Fritz von Emperger. Verlag von Wilhelm Ernst und Sohn, Berlin.

some kind, who accompanies him. Of the general intention of the painting there can be no doubt, though there may be differences of opinion as to the meaning of particular figures. In the same issue is an account of the new system of parks which is now being laid out at Chicago, and which seems to be a remarkable enterprise.

"The commissioners had started out to provide simple parks; but the conditions showed that such places, to be serviceable in a city where seventy per cent. of the people live in contracted quarters, must be more than breathing-spaces with grass, flowers, trees, and perhaps a pond and a fountain. They must afford gymnasia, libraries, baths, refectories, club-rooms, and halls for meetings and theatricals. They must be useful day and evening, summer and winter. The public must receive a continuous and ample return upon its investment—daily dividends in happiness, health, and progress. Thus the idea of the field-house, or neighbourhood-centre building, had its birth. Every field-house contains a gymnasium for women and girls, provided with apparatus, shower-bath, plunge-bath, and lockers. In another part of the building is a like gymnasium for men and boys."

There are refectories, club-houses, and a large open air swimming pond, with dressing-boxes for men and women. The whole scheme forms an example that might well be followed by other cities.

In the *Pall Mall Magazine* Professor Nispi-Landi, the Government Inspector of Italian National Monuments, writes an interesting illustrated article on "The buried treasures of the Tiber," which have been the object in recent times of special exploration. The number and the value of works of art which have been fished up from the bottom of the river seem to be extraordinary. Every shovelful of the sand of the river, we are told, contains something valuable. Many of these things, we have no doubt, got into the river through accident; but there is a record of a great throwing over of valuables and works of art in the middle of the Vth century, when the Goth was at the gates; among them was said to have been the seven-branched gold candlestick of the Arch of Titus, with other spoil of the Hebrews; and the writer of the article is convinced that it is still in the Tiber, and may be found. Illustrations of a marble and a bronze figure (an Apollo and a Bacchus) found in the river, are given, as well as other less important works. An article under the title "From Steam to Electricity" gives a popular account of the work going on in preparing the Underground Railway for electric working, with some illustrations of the power-houses, the new rolling-stock, etc. We are informed that under the new arrangements the carriages are to be all of one "class," i.e., the distinction of first, second, and third class is to be done away with. We can only say that we greatly regret to hear it, and we think that, from the point of view of the comfort and convenience of the public, it is a great mistake. That it may be more convenient to the railway company is quite possible.

In *Harper* Professor Rutherford writes an article suggesting that radium is the cause of the earth's heat. We must leave it to the reader of the magazine to follow out the Professor's reasoning. The result of it is consoling, inasmuch as, on the theory that radium may be the cause of the heat both of the sun and of the earth, he promises something like an eternity of heat for both luminary and planet, instead of the ultimate degradation of both to a state of inanimate cold, which has been the rather disheartening creed of recent science.

Mr. W. H. Shenstone, F.R.S., who wrote last month in the *Cornhill* on the method of weighing the earth, writes what may be called a companion article this month on "Weighing Atoms." The article is still reading for a general magazine, but it will be a very useful one to the readers who will give themselves the pains to follow out carefully the exceedingly recondite reasoning by which is estimated the weight of things that we can neither see nor feel.

In the *Antiquary*, the Rev. J. B. McGovern commences a series of articles on the much vexed subject of the round towers of Ireland. If he can lay the ghost of this controversy he will have accomplished something. He is (so far) in favour of the Pagan origin of the towers, and hews lustily into the Christian believers in "tradition." Mr. Giberne Sieveking contributes an article on "Some old French doors and their handles." The article is accompanied by some illustrations from photographs and sketches. The most remarkable thing mentioned in "Notes of the Month" is the recent discovery, in a garden at Birkdale (Southport), of an Egyptian sepulchral tablet, estimated

by two learned Egyptologists connected with the British Museum, to whom it was submitted, as being a genuine Egyptian inscribed stone of the date of about 600 A.C. It was accidentally discovered buried deep down in the garden. Birkdale is a place of very recent growth, so that it is hardly possible that it was a possession of any previous owner of the house. How did such a thing come to be buried in what was probably at the time a field or a common in Lancashire?

In the *Revue Générale* M. Arnold Goffin brings to a conclusion his essay, "La Légende Franciscaine dans l'Primitive Italien," an essay marked both by research and a fine enthusiasm for the subject, considered not merely as a chapter in the history of painting, but as an illustration of the life and feelings of a past age.

In the *Gentleman's Magazine* an article by Mr. H. J. Webster, under the title "Some Fragments of Stone," is a short popular sketch of the history of the Elgin marbles. This may catch the attention of readers who have thought little of the subject, and open their eyes to it. But why call that "stone" which is marble?

The *Church Builder* (quarterly) gives an illustration and description of the small church at Clevedon (Somerset), doubly interesting—in itself, and as being Tenyson's "In Memoriam" church, where is the memorial tablet to "A.H.H." and others of the Hallam family—

"And in the dark church like a ghost
Thy tablet glimmers to the dawn."

For some important necessary repairs, including new oak roofs to nave and aisles, the church is in the safe hands of Mr. Caröe.

THE ARCHITECTURAL ASSOCIATION.

An ordinary fortnightly meeting of the Architectural Association was held on Friday last week, in the new premises of the Association, Tufton-street, Westminster, Mr. Guy Dawber, President, in the chair.

The minutes and nominations having been read by Mr. Louis Ambler, Hon. Secretary, the following gentlemen were elected members of the Association, i.e., Messrs. J. M. H. Watson (London), C. E. Lovell (Gravesend), R. C. Coulson (Denmark Hill), N. Jewson (Bayswater), T. D. Dixon (Sydenham Park), J. Filtness (Richmond, Surrey), and A. A. Fillyard (London).

The President announced that the following members had rejoined, i.e., Messrs. James Lemon and A. S. Millar.

On the motion of the President, a vote of condolence was passed to the widow and relatives of the late Mr. John Leaning, who was well-known to the members, as he had taken the Quantity Surveying Class for some years.

Mr. Ambler announced the donation to the Library of a copy of "Building Materials," by G. A. T. Middleton, presented by Mr. B. T. Batsford, and a vote of thanks was accorded to the donor.

Mr. Ambler proposed a vote of thanks to Mr. H. P. Adams for kindly allowing members to visit, on January 28, the Lew Society's Hall in Chancery-lane, and to Messrs. Runtz & Ford for permission to visit on the same date the new Gaiety Hotel and Restaurant in the Strand.

This having been agreed to, The President announced that the proposed smoking concert in aid of the Building Fund had, for various reasons, been abandoned.

The President said it was his pleasing duty—a duty in which they would all join very heartily—to propose a vote of thanks to their old friend, Mr. W. G. B. Lewis, for the work he had done in arranging and supervising and almost himself hanging the casts around the walls of the museum. This had been no light task, and with Mr. Lewis it had been a labour of love. Mr. Lewis had devoted his services ungrudgingly for nearly a year in this work, and although the task was not completed, Mr. Lewis had carried out a large part of it, and the members owed him a very deep debt of gratitude, and he had much pleasure in putting the vote to the meeting.

The vote of thanks having been heartily agreed to,

Mr. C. S. Spooner read the following paper on

Church Fittings.

What do we include in church fittings? I do not much like the word, it may be under-

stood to cover a very wide field, including everything except the actual structure of the building. I take it to mean the furniture and ornaments of a church, and such decoration as is connected therewith. The furniture for a church differs from house furniture chiefly in the difference of scale and the different use to which it is put—these two conditions will, of course, materially affect the design, but there need not be any other difference. Church furniture may be of any shape and of any material, and it may be decorated in any way that pleases the fancy—provided always, of course, that it is in good taste, suitable for the solemn and sacred purposes for which it is used, and also that it complies with the rules and directions of those in authority.

What do we mean by a church? I take it that we mean a building set apart for the worship of Almighty God, and I must still further restrict the meaning, for the purposes of this paper, to the worship of the Christian religion.

For our purposes to-night we may think of Christians as divided into two schools of thought—the one, while by no means neglecting or under-rating the office of the preacher, looks upon the Sacrament of the Holy Eucharist as the central act of worship and centres everything round that act; the other school, while not neglecting prayer and praise, looks upon the sermon as all-important. Of course, each school is sub-divided—the latter very much so indeed—but these sub-divisions do not concern us here. Each of these schools keeps, more or less everywhere, its own general arrangement of churches. In the first the altar is always the central and chief feature of the church, and in the second the pulpit takes that position.

Now, it is with the furniture and ornaments of the church of the first school of thought to which I have referred that I propose to confine myself. I must still further clear my ground. This school of theological thought is, as we all know, roughly divided into three, which divisions are respectively known as the Orthodox Church of the East, the Roman Catholic Church, and the Church of England.

Differences in the rights and ceremonies of these three bodies make some differences in the furniture and ornaments of the churches belonging to each, and it is with those of the Church of England that I am chiefly concerned to-night.

There is, unfortunately, some difference of opinion about the laws and rules affecting the furniture and ornaments of the Church of England, in spite of the clear directions in the ornaments rubric, which is placed in a prominent position at the beginning of the Prayer Book, and which runs as follows:—"And here it is to be noted that such ornaments of the church and of the ministers thereof at all times of their ministration shall be retained and be in use, as were in this Church of England, by the authority of Parliament, in the second year of the reign of King Edward the Sixth." It must be remembered that the word "ornaments" "is not confined, as by modern usage, to articles of decoration." "All the several articles used in the performance of the services and rites of the church are ornaments."

The Alcuin Club has issued a very valuable tract on this subject, by Mr. J. T. Micklethwaite, in which he points out that the second year of King Edward VI. began on January 28, 1548 and ended on January 27, 1549, and that, as the first prayer book could not, according to the Act authorising it, be used by the authority of Parliament earlier than February 11, 1549—i.e., three weeks after it had received authority—the rubric refers to the ornaments that were in use before the first prayer book of King Edward VI. Mr. Micklethwaite, after giving very convincing evidence for his opinion, proceeds to give a list of the ornaments that were in use in the year 1548, and he says:—"I cannot hope that nothing will be left out of it, but I will try that nothing shall be put into it for which reasonable proof cannot be given." Such a list by such an authority is, I think, useful to us. I do not propose to give the whole of the list, there are many things which have become useless—e.g., crescents for lights and the chafing ball—and there are several which seem to me to be outside our subject.

But it is well to know, on the authority of a learned archaeologist, what furniture and ornaments are included in the rubric which regulates these things for the Church of England.

Furniture and Ornaments included in the Rubric.

The list of things runs as follows:—Images and pictures; the high altar; minor altars; the table or reredos; the altar shelf; the canopy of the altar; the upper frontal or dorsal; the nether or lower frontal; the frontlet; the curtains, riddels, or costers; the altar tapestries; lamps; the altar cross; the altar candlesticks; standing candlesticks; the chalice; the paten; the cruets for wine and water; a box for altar breads; the censor, etc.; two basins for washing the hands; registers—viz., a thin strip of silver with ornamental ends, for use as a book-marker; the sackering bell; processional cross, etc.;—alms basins; the lectern for the Gospel; the lavatory, called in Latin *scavarium* or *piscina*; the sedilia; screens; the rood loft; other lofts; the rood; stalls and desks; the great lectern; lectern cloth; lesser lecterns; the organ; chanters' stools, etc.; pews; pulpit; a desk for books; tables with inscriptions; the font; the font cover; the Litany desk; a cross for funerals; the tier or hearse, standing candlesticks, etc.; banners, standards, or streamers; the dedication crosses; bells in the steeple, the clock and chiming. To this list we might add certain things as being required in our churches nowadays, all of which have been authorised by the proper authorities. Here let me remind you that nothing should be put into a church without the authority of the bishop of the diocese—the parish priest, be he rector, vicar, or curate-in-charge, is responsible to the bishop for everything put into the church or churchyard.—Some means of warming the church; some means of lighting the church at nights or on dark days; notice boards; hymn boards; alms boxes; a bookcase for devotional books; cupboards or boxes, either in the vestry or in the church, in which to keep the frontals and altar linen, the vestments, the candles, and other things; a safe, preferably in the priest's vestry, if there be more than one vestry, in which to keep church plate, the alms, until the money is put in the bank, the registers, and other valuable things.

This is a long list, and there is, no doubt, a great deal to say about many of the things included in it.

Let us, therefore, first consider the most important.

The Altar.

The first and most important thing in the church is the altar. It is one of the things essential in the worship of the church. Most of the other things are conveniences, but some sort of altar, together with a plate and a cup, is absolutely indispensable. Besides this, on account of the sacred use to which it is put, churchmen have always desired to make the altar the most beautiful and most honourable thing in the building. In a large building the problem is how to do this, because, even if the altar is as large as possible, it still remains a small thing relatively to the building. The two ways which have centuries of precedence are, I think, still the best. First, to place it on a raised platform, reached by a flight of steps, and then, if possible, to put a canopy over it, or, at any rate, some rich background. All those things in the list, such as the reredos, the canopy, the upper and nether frontals, the carpets, tapestries, and the standing candlesticks, are for this purpose.

The altars in the churches throughout England in the year 1548 were nearly all made of stone. Mr. Micklethwaite says, in the tract to which I have referred, that "there can be no doubt that wooden altars were sometimes used in England in the XVth century, and they were not mere makeshifts, but things of some real value." And, further, "The destruction of the old altars and the substitution of movable wooden tables, which seem to have been set up at the time of the celebration of the Eucharist, appears to have been begun in the diocese of London by Dr. Ridley, in the fourth year of King Edward." "The real contest in the XVth century was not about the material so much as the position of the altar, and that was finally set at rest after 1662."

All through the XVIIIth and the first part of the XIXth centuries stone or marble altars were by no means uncommon, sometimes they were fixed to the walls or floor, and old stone altars still remain in Arundel Church, in Gloucester Cathedral, and elsewhere. Of late years, however, some of the chancellors of the dioceses have objected to altars of stone or

marble. I think this is regrettable and curious, considering the words of the rubric.

I think everyone will agree, that, although the altar is seldom seen, it should nevertheless be made of the very best quality of whatever material may be used, and the construction should be good and handsome.

It is important that the altar be of sufficient size, and, in order to give it due importance, the larger it is the better. No considerations of utility need limit the length, but anything shorter than 5 ft. is likely to prove inconvenient. I think it is a safe rule to make it as long as possible, so that it will look well and be in good proportion with the sanctuary where it stands. Utility will regulate both the height and the width. The priest stands at the altar during the whole of the celebration; it must, therefore, be high enough so that he may not be obliged to stoop unduly at any part of the service. Although men vary considerably in height, it has been found by experience that 3 in. is the limit of variety in the height of an altar. Anything lower than 3 ft. 3 in. is most inconvenient for a tall man, and 3 ft. 6 in. is as high as a short man can possibly use. I have made some altars 3 ft. 6 in. high, and the clergy who use them tell me they find that height convenient; but it is the extreme limit, and I think, perhaps, 3 ft. 5 in. is the most convenient height for an altar.

It is important not to make it too wide. The corporal is usually about 20 in. square, and a little more width than that is needed. I think 2 ft. is as narrow as an altar should be, and 2 ft. 3 in. is a better width. Unless the altar shelf (when it is intended to have one at all) stands on the altar, 2 ft. 6 in. will be found to be wide enough for any altar.

Altars should be quite simple in design, with no elaborate mouldings or carvings in high relief. It is essential that the edge of the top be almost square, the angles should be just softened, and, if it is desired to enrich it with mouldings, they should be sunk into the flat edge, and on no account must such mouldings turn over on to the top of the slab. Unless the top of the altar is perfectly flat and smooth right out to the extreme edge, there is a risk of the sacramental vessels being upset. There is also a danger of irregular projection or points, such as might occur in high-relief carving, or open tracery, catching in the vestments of the celebrant. Such risks should not be run. Moreover, ornament of this kind is out of place. It is better for altars to be quite plain in design, but of handsome material, and to reserve for the frontals such ornament as funds will permit.

The top or slab should be thick and heavy—a slab of stone or, better still, marble, carried on five pillars is perhaps the best general form—or if wood is to be used, then, I think, it should be framed together with five or more legs braced at the bottom, and carrying a thick top, which (so that it may not split or warp) should be framed with flush panels. I have myself made wooden altars with framed fronts, ends, and backs; but I now think that is not the best way, and I recommend the form of a heavy table as being altogether better.

What I have said about altars applies, I think, to all, whether a high altar or side altars, with one exception. The minimum length of 5 ft. is not enough for a high altar—i.e., an altar which may be used for a high celebration—the minimum length in this case should be 8 ft., as the celebrant, the deacon, and the sub-deacon stand side by side in certain parts of the service, and anything shorter than 8 ft. looks undignified. In churches where there is only one altar it is better to make it the high altar, and a length of 8 ft. will not be found to be too much even in the smallest churches. A high altar should always stand raised upon a platform, three steps above the level of the sanctuary floor, and not more than three. The sanctuary itself may be at any level above the chancel that is not inconvenient. These three steps are required for the celebrant, the deacon, and the sub-deacon, or, as they are sometimes called nowadays, the gospelist and epistolist. I myself prefer the old names.

The top step should be deeper from front to back than the others—a clear space 3 ft. at the least is necessary in front of the altar, and rather more is better. The other two steps should be at least 18 in. deep (front to back). The height, or rise, is a matter of taste, and will be subject to varying conditions, but I think it will be found inconvenient if the rise of each step is greater than 7 in. The rise of all three should be the same.

It has been supposed that the cross and candlesticks should not be placed upon the altar itself. It appears, however, that in the year 1548 these ornaments often stood upon the altar, and Sir Walter Phillimore wrote to one of the members of the Alcuin Club that "No court has decided that it is illegal to put candlesticks directly on the mensa."

The altar shelf has become very usual nowadays, no doubt by reason of the foregoing supposition; nevertheless, it does not seem to have been uncommon towards the end of the Middle Ages to put the cross and candlesticks on a ledge or shelf, either standing on the altar itself or just behind it. It is mentioned in many inventories, where it is described by different names, which, however, all mean the same thing. In some places, I think, such a shelf adds to the dignity of the altar, and is a convenience. It is better for it to stand behind the altar, rather than upon it, unless the altar is very broad, in which case it should be loose. In the former case it becomes the base of the reredos. The shelf should be from 9 in. to 12 in. wide, to give room for the cross and candlesticks to stand upon it, and it should not be too high. It may be ornamented with carving or painting, or covered with a cloth, coloured and ornamented or not, according to circumstances.

The Reredos.

The object of the reredos is, as I have said, to give dignity and importance to the altar, and this should be the first consideration in designing a reredos. It must be spaced in such a way as not to detract from the altar, nor to overpower it, but rather to add to its prominence and make it unmistakably the principal object at the east end of the church. The existence of a reredos will not necessarily do this—indeed it is possible to draw the attention away from the altar and to make the reredos itself the principal object; and it is very easy to do so, especially as the purpose of the reredos is not always sufficiently realised. I suppose effect is produced by the right relation of things one to another, by subordinating certain things to other things, and by concentrating the means at disposal at the right points. Certainly, differences of spacing and proportions make great differences in effect.

The size of the reredos will vary, of course, greatly. Much will depend upon the amount of money that may be spent upon it, upon the character, materials, and lighting of the church. Besides giving dignity and prominence to the altar, it should harmonise with its surroundings in size, shape, and material. Generally speaking, the simpler it is in form the better it will look; much variety of outline seldom adds dignity, and often detracts from that quality. The choice of material, too, is a thing of vital importance to good effect, and no general rules can be given, since any material may be used. There is, however, one material which seems to me hardly suitable for a reredos, and that is mosaic—unless the reredos is to form a part of a complete scheme of mosaic decoration. If mosaic is used at all, it needs to be used in large quantities and in conjunction with marble, also used in large quantities. Under these circumstances, nothing perhaps could be finer. But a single panel of mosaic, surrounded with a frame of marble or alabaster, is so very different to all the surrounding materials that it seems impossible to make it take its proper place in a building. Again, I think it is a safe rule never to use mosaic unless it can be 15 ft. at least from the eye.

Generally speaking, I think the reredos is better as a separate thing, not forming part of a scheme of wall decoration, but a definite background to the altar, a sort of solid screen at the back of it, with perhaps the altar shelf or shelves forming part of it. These shelves can be used for flowers at high festivals. There are many ways in which such a reredos can be treated. Some old examples remain, for instance, that at Winchester Cathedral, at St. Albans, and at Southwark, to mention three well-known ones. They consist of a great screen of niches filled with figures, but so divided as to give due importance to the altar. This is done by a vertical division a little wider than the altar and by a part immediately over the altar being treated to a different scale to the rest.

The effect of these reredoses must have been magnificent. There seems little hope that we can do anything of this kind at present. Our

sculptors nowadays seem to have turned their attention to realistic portraiture instead of to decorative art, and, until someone arises who is possessed with both the devotional and the decorative spirit, figure sculpture is out of our reach—unless, indeed, M. Rodin would turn his immense powers to express the devotional as well as the intellectual.

A painted reredos might be attempted with better chances of success, if indeed there was any real desire to make use of the best of our painters to ornament our churches. I cannot forget the fact that five, if not more, really great painters—men who possessed the decorative and the devotional spirit equally, I think, with any of their predecessors—have died during the last few years, but, as far as I know, only one of our cathedrals and very few, if any, of our parish churches have a single example of their paintings.

There is one picture by Watts at St. Paul's Cathedral, which, unless I am misinformed, he himself gave to the dean and chapter, but we shall have to search indeed to find any paintings by Rossetti, Madox Brown, Burne-Jones, Millais, or Watts in our churches. Thousands of pounds have been expended upon stained glass during the lives of these men, much of which is rather a disfigurement than an adornment to the churches where it has been put up.

I am afraid architects have been too ready to employ tradesmen to carry out decorative work rather than artists. I know quite well how much more smoothly everything goes, promises are kept, the work is done *very cheaply*, and, alas, these things please our clients more than a work of art would. The blame must, therefore, rest upon their shoulders rather than on those of the poor architect, who certainly has to bear quite enough blame for other people's failures.

Of course, unless there is a good deal of money to spend on a reredos, it would be impossible to employ a great artist, be he sculptor, painter, or anything else, although I am inclined to think that it need not be so costly as is sometimes supposed.

It is a mistake to attempt any sort of figure decoration, unless an artist can be employed. It is of no importance whether the artist is working independently or for a firm so long as he is an artist and can work and express himself freely. But, so far, the firms who undertake decorative work have not succeeded in finding artists to work for them, with some rare exceptions. I think the reason is that they have not realised that an artist cannot work, except in his own way. If he has to obey orders and do as he is told, one of two things happens—either he gives it up altogether or he degenerates into a mere mechanic. I believe great good might come to everyone concerned if these firms could be induced to employ artists, to consult them about their part of the undertaking, to put them in direct touch with the customers, and allow them to have the credit due to them for their work; to leave them as free as possible to work in their own way and to pay them a fair amount for their work. It would relieve the artist of much business which the business man would do better, and it would save the business man from bothering about things that he has no ability to deal with, and from a good deal of humbug.

In cases where figure work would be too costly, very good effects may be produced by painted patterns, more or less repeating, dividing, and powdered over a field of colour, or even colours. I need hardly say that it wants a very nice sense of colour to produce a good effect, but this surely comes within the work which an architect should undertake personally. For such a purpose I would recommend the use of very few colours, and I think very much may be learnt from good examples of heraldry in the use of colours and metals.

The heraldic rule—never to put colour on colour or metal on metal—is one to bear in mind, although it need not be so binding in decoration as in heraldry; such rules tend to simple effects and treatment, and are useful on that account.

Everyone will find his own method of using colour. One very good way I would suggest is to lay on the colour very bright—almost, if not quite, pure—and then to glaze it down with thin coats of colour superimposed till the brightness or crudeness has been brought down to harmonious tone. Personally, I much prefer tempera to oil paint. I think it has a pleasanter quality, and it darkens less with time.

The Frontal or Dossal.

This brings me to the upper frontal, or dossal, which serves the same purpose as the reredos, namely to give dignity and prominence to the altar, and it is perhaps the best way of doing so in poor churches where they cannot afford a good reredos. It may be of any material, even cotton, and may be hung in any way that will give a good effect. If it is brought right forward over the altar as a canopy a very good effect may be obtained, but it looks much better if the material is suspended over rods of metal, and is all in one piece, rather than if it be strained over a board. I think hangings nearly always look better if hung more or less full. The folds of hanging drapery are one of its distinctive beauties, differentiating it from everything else. It is a little more difficult to hang it full and to bring it forward over the altar, but it is worth the extra trouble. There is, however, one drawback to a canopy—it is apt to get very dirty from the smoke of the candles; indeed, a canopy must always be a considerable height above the altar. The amount of smoke that a good-sized candle makes is surprising, and, as the candles always stand in the same position, the smoke is concentrated in one place. For this reason, too, it is well to arrange for the candles to stand well away from the dossal, or from the reredos.

At each end of the altar should hang the curtains, or riddles. They should be about as wide as the altar, and may be of any height, so long as they are well above the candles, to protect them from being blown about by currents of air. It looks better, I think, for them to be a good deal lower than the dossal, unless the dossal itself has to be low. They may be hung from rods which fit into sockets in the east wall or attached to the poles which carry the dossal. In some old manuscripts with pictures of the celebration of the Mass the riddles are shown hanging from rods carried by poles at the four corners of the altar, and also as a continuation of the dossal, the whole being carried round the three sides of the altar.

The dossal and riddles may be of any colour or colours, and of any material. The colour must, of course, harmonise with surroundings and the liturgical colours of the frontals and vestments. The dossal and riddles are not changed with the frontal to the colour of the day. When funds permit, it is nice, of course, to have extra gorgeous hangings for the great festivals, but two sets are enough for any church.

It is, I think, absolutely necessary to see a large piece of the material in the church in the position where it is to hang before choosing. The surroundings and light are so very different to a showroom, and in a building the size of a church very strong colour is necessary in order to get any effect of colour.

Most delicate tints have a tendency to look grey. But it is impossible to make any general statement, for colours are so very much affected by what is next to them or near them, by light, and by position that it is almost impossible to tell how they will look without seeing the actual materials together in the position they are to occupy.

The nether or lower frontal is "the cloth in front of the altar, to which the name frontal is now generally given."

The frontal for the high altar "was amongst the things to be found by the parishioners," says Mr. Micklethwaite, in his *Alcuin tract*, "and old pictures of English altars in use always show them vested." "There is no English authority for the altar itself being carved and painted. Most old ones were quite plain, but a few were panelled in front; as, for instance, that in William of Wykeham's Chapel in the Cathedral Church at Winchester. The covering of the altar with a carpet of silk, or other decent stuff" at the time of service was ordered in the canons of 1603, which set forth the least in the way of ornament which might be tolerated."

The frontal need not be mounted on a wooden frame. If it is well made with a proper backing, it can be hung with rings and hooks under the slab of the altar, and can be folded up and put away in a drawer when not in use. The five liturgical colours in the Church of England are white, red, green, purple, and black, and, therefore, five frontals are required. Black is only used for funerals, on Good Friday, and on occasions of national mourning. Poor churches can do without it—on such occasions they would use the purple frontal. A dark

indigo blue answers the same purpose as purple, and it is easier to get a good quality of colour in this than in purple. Any colour may be used to decorate the frontals that fancy can desire, so long as the colour of the day is not obscured and everyone can see that it is white, red, green, or purple. The purple frontal should have very little ornament, and should be very subdued; it is used at penitential seasons, and sometimes at funerals.

The frontal was a strip of stuff fringed on the lower edge and sewn as an 'aparel' on to the front edge of one of the linen cloths, from which it hung, so as to hide the suspension of the lower frontal."

The frontal need not be changed with the frontal, and may be of any colour that will harmonise with the five frontals. It is better, I think, to have a purple and a black frontal to use with those two frontals.

It is usual for both frontals and frontlets to be ornamented with embroidery, and, when it is well done, nothing could be more beautiful or suitable. But, just as much as the painting of the reredos, it needs an artist to do it. The firms and the church shops have failed in this respect just as diametrically as they have in pictures and windows, and, unless an artist can be employed to do the embroidery, it is much better to do without. Simple bands of colour or woven or printed patterns will be infinitely better than the mechanical and inartistic work of which there is such a painful amount in our churches.

Carpets and Tapestries.

Carpets are often mentioned in old inventories, but it does not follow that the word means what we understand as a carpet—*viz.*, a floor covering. It was used for any cloth or covering. The cloth covering the seat of the sedilia and that covering the lectern as well as floor coverings were called carpets. A carpet to go on the floor and over the steps in front of the altar is a great addition, almost a necessity. It prevents any chance of the priest slipping, and makes all his movements quiet. I like to see it brought right down the chancel—it gives a fine bit of colour and a strong leading line up to the altar.

Tapestries, or wall hangings, are amongst the ornaments of the rubrick, and may be used with good effect in many places, particularly on the east wall and round the sanctuary.

The Altar Cross.

Mr. Micklethwaite says, "A cross was not thought a necessary ornament for an altar, although a common one. The cross, which a parish was bound to provide was for processions. But often it served for the altar as well, being fitted with a foot to stand in and a staff for carrying." This cross generally had a figure of Our Lord crucified, and sometimes there were brackets at the sides with figures of St. Mary and St. John."

The bedroll of St. Mary's, Sandwich, recorded the benediction of John Colwyn and his wife, who gave "the best cross of sylver and gilt with a staf of laton ther to, the whyche cost XXV." and also of Thomas Grene and his wife and John Byschop, who gave "the fote of sylver for that crosse to stand ther on the high altar."

There is a curious superstition in the mind of some people, and, amongst others, some of the Chancellors of the English Dioceses, that, although a cross may be used on our altars, it must on no account have a figure on it. In the year 1548, to which the Prayer Book refers us, it seems more than probable that every altar cross had a figure on it. Inasmuch as the cross is the Christian standard, I do not know that it is a matter of great importance, from a didactic point of view, whether it bears a figure or not; but from that of the artist it is very desirable, when funds permit, that it should be generally accepted that it requires the highest artistic ability to represent the figure properly, and one would suppose that every Christian would desire to see the best art and the best work lavished on the standard of the Kingdom of Heaven. Here, again, when there are no funds to provide a work of art, it is better to have no figure at all.

In my opinion any kind of naturalism in a crucifix should be avoided—a quiet, dignified figure, expressing self-sacrifice and divine love, rather than a human being in torment is very preferable. I myself like the sentiment of a Christian art (that of Our Lord conquering Death) better than the late medieval and renaissance treatment of the crucifix. The

altar cross should not, I think, be very large. It is, after all, the standard in front of the priest, rather than in front of the people. The great rod answers the second purpose, and it is always behind the priest when he is in the sanctuary.

Altar Lights.

"The direction in the Order of Communion," says Mr. Micklethwaite, "that the old service should continue without varying of any rite or ceremony, sends us back to the ancient usage as to altar lights." "The Order of Communion was to come into use on Easter Day, 1648, and to continue until it was superseded by the English book of 1549." The ancient usage "differed much in different churches, the only fixed rule being that there should be at least one light on the altar at the time of Mass. Rich churches would have more, and it was the custom to vary the number according to the day or service, but the greater number of parish churches probably had ordinarily two lights on the high altar and one on each side altar. On occasions the number used might be very great, but, as a rule, the extra lights were put round about the altar rather than on it. The lights were used at Matins, Mass, and Evensong. The modern custom of having several sets of candles on the altar at the same time for use at different services has no authority in antiquity."

It is better, I think, for candlesticks to be of the same material as the altar cross, and here let me say that it is not necessary to use brass. It is, no doubt, a very good and beautiful material, which is, by the way, generally spoilt by being lacquered, but sometimes a material of another colour would look better.

I must pass over several things in the list of ornaments, of which, no doubt, much might be said, such, for instance, as the chalice and the processional cross. The lectern for the Gospel is rarely if ever used nowadays. Mr. Micklethwaite says, "richly furnished churches often had them," and "in a few churches, chiefly in Derbyshire, stone Gospel-desks are found against the north wall. Such exist at Mickleover, at Crich, and at Chaddesden, all in Derbyshire."

The Piscina and the Sedilia.

We do not always find a *piscina* in modern churches. It is supposed not to be required, but that is a mistake. It is required as much to-day as it was in the Middle Ages, and for similar purposes. It may be made as a beautiful little niche in the south wall of the sanctuary, and it may be combined with the credence, although a projecting shelf or table is more convenient than the small shelf found in many old churches. The drain from it should always run into the ground.

The *sedilia*.—Mr. Micklethwaite, in the *Alumni Club tract*, gives the following interesting note—

"What we call the *sedilia* is the last remnant of the bench which, in primitive times, ran all round the apse and was assigned to the priests, whence probably by tradition came the name presbytery, which seems to have been the old English name. In the contract for the rebuilding of Catterick Church (1412) they are called three primatories, an evident corruption or miswriting of presbyteries."

The *sedilia* is a triple seat for the celebrant, deacon, and sub-deacon. It should always be on the south side of the sanctuary. In old days it was generally formed in a triple niche, or arcade, recessed in the wall, and the seats were sometimes stepped down to express the degrees of the clergy, but this was not always done. There are many beautiful examples of the *sedilia* and *piscina* and credence combined in an arcade of four arches or niches. Of late years it has become more usual to make the *sedilia* a separate and movable piece of furniture, generally of oak, sometimes with a back and canopy, and on the whole, it suits us better than stone seats, which are apt to be rather cold. In building a new church it would be well to form a recess in the south wall large enough for three seats side by side, and to fix a wooden seat and back divided into three, allowing a width of 2 ft. for each seat at least, and more if there is room. Everything must be soft, smooth, and round, no sharp points or open tracery, that might catch in the vestments. There is no longer any need for a canopy now that the windows are filled with glass and the church is comfortably warmed.

Screens.

The next items in our list are screens, the rood loft and the rood; all of which we may consider together. During the XVth century screens seem to have been erected in most churches to enclose the chancel, and chapels, and elsewhere. Some still remain unrestored (long may they remain so). They are quite exquisite in line, in detail, in sentiment, and in workmanship. Richly ornamented with carving and painting, they are among the most beautiful works of art that Englishmen have produced. They have suffered frightfully, first at the hands of puritan fanatics, and then by the blind neglect and stupidity of XVIIIth century protestantism, and last, but not least, most of those that escaped or survived these two causes of destruction have been stripped of their colour and so "improved" by well meaning, but mistaken "restorers" that but little of their beauty remains. Enough, however, remains to make me, for one, exceedingly wroth with the sacrilege that destroyed them and the stupidity that restored them. But enough remains also to teach us, to inspire us, and to guide us. May I beg all here to move heaven and earth to preserve these priceless relics that still remain from further destruction or restoration. They will remain a very long time yet if proper care is taken of them.

On top of the screen separating chancel from nave, and supported by it, ran the rood loft, reached by a winding stair. The rood loft was used as a minstrels' gallery. It was customary for strolling minstrels to be hired on great festivals. Parts of the service were occasionally sung from the rood loft, but not the Epistle and Gospel.

The rood itself, a large cross with a figure of Our Lord carved or painted upon it, and generally the figures of St. Mary and St. John, stood upon the rood loft, or was suspended over it from the chancel arch. Sometimes other figures of saints and angels were added, and upon the loft many candles were put. There are reasons for and against a chancel screen of a theological kind—which do not concern us now. Such screens are beyond doubt among the ornaments of the rubric, and they add greatly to the beauty of a church. Screens are generally required by the authorities to separate a chapel from the rest of the church. It is questionable whether a rood loft should be put nowadays, unless it is required for a practical use, which will only be the case in some churches. We no longer engage strolling minstrels who have to be put where they cannot get at valuables, in case they should be tempted to steal. All too few of our churches, however, have anything worth stealing.

Screens may be made of stone, wood, or metal, or a combination of any two or all three of these materials. On the whole, I think wood is the best of the three, but that may be because I have a particular affection for woodwork.

There are a few conditions that should regulate the design of a chancel screen. The clergy stalls ought to return against the chancel side of the screen, therefore the lower part must be panelled with solid panelling to a sufficient height to form the back of the stalls, from 3 ft. to 4 ft. from the chancel floor. It is undesirable to block the view of the altar from the congregation, and, unless it is raised on several steps, a high solid base to the screen would do so. If the chancel is long enough to allow of such an arrangement, it looks well, I think, for the chancel floor to be only one step above the nave and for the sanctuary to be raised three more steps beyond the choir seats, leaving enough space at the east side of the choir seats for easy access to them on their own level—say, 2 ft. 6 in. or 3 ft. wide. It is awkward for the members of the choir to have to step down to reach their places. Thus, two steps, with a tread of 12 in. each, would ascend from the level of the chancel to a space at least 4 ft. wide for the communicants; then one step more to the level of the sanctuary floor. A space of at least 5 ft. 6 in. must be allowed before the next step rises. (The altar rail, if there is to be one at all, should be set 18 in. back from the front edge of communicants' step, leaving a width of 4 ft. within.) Then two more steps, each 18 in. wide, and a foot space in front of the altar 3 ft. wide, making a total length eastwards beyond the choir seats of 18 ft. 6 in., or 19 ft. to the front of the altar. The altar itself would be raised seven steps above the nave—say, 3 ft. 6 in. or 3 ft. 9 in. In the former case all steps having a rise of

6 in., in the latter the first four having a rise of 6 in., the last three 7 in. The screen would be fixed on the first step, and the panelled base might be 3 ft. 6 in. high, without hiding the altar. In my opinion, the central opening should be nearly as wide as the altar—7 ft. or 8 ft. in a narrow church, and more in a wide one. It is well, I think, to have as few mullions as may be, and for them to run up a considerable height before the more intricate and ornamental part of the screen begins. Where a loft is not required, I think a strong horizontal line looks well at top, with or without a cresting. In churches where there is no chancel arch, I see no reason why the screen should not run up and be framed into the timbers of the roof, with the rood and any other figures worked into the design of the screen itself. In spite of the long tradition there is for standing figures on top of the screen, more or less isolated, I must say I feel that, if they could be joined on or worked into the design of the screen, it would have a better decorative effect—amongst other reasons, no doubt, because the figures must be less realistic to take their proper place in the whole. In some churches, especially where the chancel is narrow and there is a chancel arch a high screen may not look well. In such cases a low screen of stone or wood is wanted to stop the return stalls. The rood may then stand upon a beam, in which case it is better to have a little ornament of some kind to connect it to the beam. Or it may be suspended in the arch, which is, perhaps, the better way. In either case a cloth of suitable colour hung behind helps the decorative effect. The rood should not be too plain, whether or not figures be added—it is, as I have said, the standard of the Christian army, the symbol of self-sacrifice, rather than the cross of execution.

Gates may be added either of wood or metal, and in churches where valuable or holy things are kept in the chancel they are most desirable, to prevent theft or sacrilege. In such churches a strong but very light metal grille should be fixed between the mullions of the screen. Most, if not all, medieval screens were painted, and there is every reason why modern screens should also be decorated with colour. The probability of failure is considerable, and it should not be attempted, unless it can be carried out by one who possesses a keen sense of colour. Most modern attempts are such dismal failures it makes one think that the colour sense is now very rare. But there are some exceptions to the failures, and improvement is impossible unless attempts and experiments are made. In the old examples of painted screens that remain very few colours have been used. Nearly all good colourists seem inclined, from time to time, to reduce their palette.

I personally deprecate the attempt to reproduce the work of the past. An artist cannot copy other people's work, either in form or colour. His work may, no doubt, unconsciously reproduce forms and so forth, but, however strong the resemblance may be between his work and that which he most admires, it will not be a copy or reproduction, but his own expression of the beautiful. The demand for mere copying leads to the very poor, uninteresting, and inartistic work which is to be seen in such large quantities all around us. The old work has been studied a great deal, no doubt, but perhaps more with a view to reproduce than to learn, to copy than to acquire experience and knowledge.

No one has ever made a closer or more careful study of old work than did William Morris, and no one ever copied less than he did. He did not confine his study to one branch of old work, but to all, and he made just as careful and close a study of nature, the fountain-head of all beauty. The study of nature has been too much neglected. It seems to me absolutely essential for everyone connected with the decorative arts.

[Owing to the length of Mr. Spooner's paper, we are compelled to divide it here. The remainder, with report of the discussion, will appear next week.]

RURAL BUILDING BY-LAWS.—At a meeting of the Chislebury Rural District Council, at Lewes, on the 10th inst., the Surveyor (Mr. H. Weller) reported that the building of Sir William Grantham's cottages was being continued. The Council has not yet decided what action shall be taken in view of this development of the case.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS.

II.—DEPTFORD MUNICIPAL BUILDINGS.

THE second spring visit, held on Saturday, 11th inst., at the new municipal offices, Deptford, was in every way a very interesting experience to the many members who attended, and the presence of the architects Mr. Lancaster and Mr. Richards, who kindly gave much information concerning their work, contributed much to the success of the occasion.

Being a municipal undertaking, the customary competition was duly held, and in our number of November 1, 1902, we published the selected design together with two plans. It is gratifying to find that the original conception is but little modified; indeed, it was generally felt that the actual result somewhat exceeded the good impression of which the competition drawings gave promise. The limited area of the site, together with a large accommodation, added to the difficulties of the scheme, but by taking skilful advantage of the levels and introducing a mezzanine floor in the back part of the building, the authors have produced what is found to be a very simple and convenient solution of the problem.

It is perhaps unnecessary to recall the general arrangement of the departments; we give, however, some impressions of the interior and the exterior.

The entrance-hall and staircase are dignified and are thoroughly befitting the importance of the central communication. The barrel-vaulting and domes suggest a Genoese influence, and afford many interesting vistas from the various corners of the hall. The work is given a heavy character throughout, but here, as indeed in all parts of the building, a satisfactory consistency is maintained. The original proposal of lighting the staircase from a glass dome is modified by the introduction of four somewhat small oval lights within the circle, the spandrels of which are filled in with plaster enrichments. Although a bold experiment, the result justifies the means, and affords an instructive study in direct top lighting.

In the council chamber and committee-rooms the same broad treatment is at work in the plaster-panelled walls and enriched ceilings. Two interior views of the building will be found in our issues of July 16 and September 3, 1904.

The chief interest, however, lies in the Portland stone facade, in which the authors confess to an attempt to carry on the XVIIIth and XVIIIth century tradition of the town hall buildings of neighbouring riverside towns. Here the principal study appears to have been directed, and has culminated in a thoroughly fresh and vigorous composition, yet fittingly expressive of its municipal purpose. A free use of sculpture is made, in which naval and marine detail is introduced. Cornices, architraves, and other features are again heavily moulded and generously carved. This over-elaboration of parts is an enfeebling element in what is a bold piece of massing. A vast amount of incident and enrichment is given to the central portion of the front, which thus becomes irritatingly busy, and would inevitably be valueless but for the accidental juxtaposition of the two simple wings and of the wide, overhanging verges of the main gable. This suggests a departure from, rather than a continuance of, local architectural tradition, but the whole composition is a great piece of architecture possessed of a welcome individuality, spirited and living; and, what is very satisfactory, forms an important addition to the public buildings of London.

The visitors enjoyed ample time in going into every detail in the work; the visit to another building, included in the afternoon's programme, the South-east London Synagogue, was in no way instructive.

THE DURER SOCIETY.—This Society, which was founded in 1898, has just issued the seventh volume of facsimiles to its members. The address of the Society has been transferred to 32, George-street, Hanover-square, W. **BISHOP HOOPER MEMORIAL.**—On Thursday, February 9, was unveiled, after its restoration, the monument which was erected in 1861 on the spot in front of St. Mary's-square, Gloucester, where John Hooper, Bishop of Gloucester, was burned at the stake on February 9, 1554-5. The monument was set up, and has been restored, by public subscription; the restoration has been executed, at a cost of 400*l.*, under the superintendence of Mr. F. W. Waller.

THE ROYAL SANITARY INSTITUTE: SCHOOL BUILDING AND EQUIPMENT.

ON Thursday, the 9th inst., a discussion took place in connexion with the conference on school hygiene at the London University, South Kensington, on "Building and Equipment," Sir Wm. Anson, Bt., M.P. (Parliamentary Secretary of the Board of Education), presided.

The Chairman, in opening the meeting, said the Board of Education attached great importance to school hygiene, which had lately been prominently before them in consequence of an important deputation from the medical profession. The particular matter they had to deal with that day was not so much the physical health of the children or the mode in which the laws of health could be imparted as the importance of school buildings and apparatus in promoting the health of the scholars. They were fortunate that day in having the opportunity of hearing the views of Sir Aston Webb, not only because of his great reputation as an architect, but because of his special experience in this matter of school building. He knew that the building rules of the Board of Education were likely to come in for criticism, but the Board had endeavoured to frame workable rules, and they hoped to learn something from such discussions as these which would enable them to amend those rules and adapt them for the requirements of the times.

Sir Aston Webb said that in school building, as in all building which was in process of development, it was the architect's duty largely to put into concrete form the requirements which the experience of those engaged in the responsible occupation of bringing up children considered necessary. He felt that for the commencement of a scheme three parties should be brought into conference, and these were the promoters and governors who had to find the money, the master who had to find the brains for the instruction of the children, and the architect who had to design the building. Unfortunately in practice this was rarely done, and the omission was accountable for many mistakes from which a school may never recover. When the three parties he had mentioned had agreed upon the requirements and the amount of money which could be spent, a site could be sought, and, this having been obtained, the architect would prepare his plans with the full responsibility of having been taken into the confidence of his clients, and being fully aware of their aspirations and ideals. The considerations for the site should be a dry soil, easily drained, with a gentle slope towards the south, and an available road for entrance on the north of the site. This enabled the frontage to be on the north side and the rooms and playgrounds to be placed on the sunny side. The site should be, if possible, in a somewhat prominent position, and the building, however plain, should have something about it to express the nobleness of its purpose and impress the children with the dignity of learning. It had been said in one of the papers that morning that architects were apt to sacrifice the interior for the elevation, but he thought all interested in building would agree that, while the planning of modern school buildings was immensely superior to the older buildings, the exteriors did not show a similar superiority, and clearly the tendency now was to devote great care to the planning of these buildings. The two great points to consider were sun in the rooms and free distribution of air around the buildings. This meant the avoidance of enclosed quadrangles, and the time was coming when it would be thought as impossible to build a school round a cloistered quad as a few years ago it was thought impossible to do anything else. The type of school generally adopted now was a series of detached blocks connected with a corridor on the ground floor. There must be ariel circulation round the sanitary blocks, but there was no reason to place these blocks so far away from the main buildings as was sometimes done. The plan and arrangements of all schools should be as simple as possible; the corridors straight and wide and light, and the position of the rooms and staircases such as could be easily understood. The old grammar schools consisted generally of one hall. The schools built for the London School Board first consisted of class-rooms connected by corridors, now a combination of a large hall with class-rooms round, and this was an admirable and economical planning of day schools. Generally the cloak-rooms in day

schools were not at present large enough. He advocated glazed walls and asphalted floors for these rooms, and also glazed walls for the sanitary annexes. The question of flooring of the rooms in schools was a difficult problem, and after trying many things he was in favour of wood blocks on concrete. Dormitories should be constructed much on the principle of wards in hospitals, with 800 cubic ft. per boy. All sanitary fillings, etc., should be placed in annexes. Walls of dormitories were best distempered; the wood-work plain, polished, and as few mouldings as possible. With regard to the materials for school buildings, dryness was the great point, and he thought brick walls were more waterproof than stone. A good drainage system to start with was not sufficient, but there should be an annual examination to see that all was working well. Heating and ventilation could be obtained in several ways, but it must be remembered that all parts of a school did not necessarily require the same treatment. Whatever system was adopted it was desirable, in addition, to have fireplaces in the rooms, although they might be little used. Hygiene was a question on which finality had been by no means reached. As architects they were willing and anxious to take their share of the work of bringing the buildings up to the standard which might be required, but hygiene as applied to schools was not merely a matter of cubic space, ventilation, and drains, but pleasant and aesthetic arrangements were also needed, for they had much to do with the health and happiness of the children, and must not be overlooked.

Weak Points in School Design.

Mr. J. Osborne Smith said he proposed to restrict himself to the indication of a few weak points in school design. There could be no question that the health of the teachers and children would be largely increased by the work now being carried on under the Acts of 1890 and 1903 to improve the "non-provided" school buildings. The large number of these buildings which are found to be structurally deficient would seem to indicate that the heads of the Education Department have been very lax in the past, or that the system of inspection has been radically wrong. Probably the backward condition of these "non-provided" school buildings was due in great measure to the fact that reports upon the structural and sanitary condition of the buildings have been made to the Education Department by inspectors appointed to examine the children, and not by persons skilled in designing and constructing school buildings. There was still much good secondary teaching done in adapted buildings, in large private houses, altered and extended to be as suitable as may be for school purposes, but the work in such buildings was carried on under serious disadvantages, as compared with similar work in specially designed buildings.

The floor space must depend not only upon the kind of desks intended to be used, but also upon the rapidity with which the air inside the building can be changed, and the requirement that every part of the room shall be well lighted. The experience of teachers, medical officers of health, and architects in America, on the Continent, and in this country, indicates that 15 sq. ft. of floor space and 200 cubic ft. of air space per pupil should be the minimum provision for classrooms in which there are adequate means for warming and ventilating. That was the minimum required for health. The Board of Education had recently fixed the floor space for secondary schools at 18 ft., but 10 ft. continues to be the official minimum for elementary schools, and 13 and 16 ft. (according to the kind of desk used) for the higher elementary schools. Medical officers of health were continually urging that classes should be reduced in size, and the air space per child should be increased. Yet it was ordained by the Education Department that the children in the elementary schools might have only a trifle more than half the floor space and air space given to children of similar age in the secondary schools. Surely we might claim that as 15 ft. has been shown by universal experience to be the healthy minimum floor space, 10 ft. should no longer be officially recognised as sufficient. Classrooms for twenty, five or thirty need not be more than 12 ft. high, or even less, provided the means for ventilation are suitable and sufficient. Economy in the height of rooms was more commendable than

rection of the floor space below the acknowledged minimum healthy standard.

It was not always possible to secure the most suitable aspect for a school building in a town owing to the limited extent of the site, the presence of high buildings near the boundaries, and other causes. Much, however, might be done by avoiding the temptation to set the building's best elevation parallel to the street regardless of the aspect, as was too often done. Sunless rooms could in most cases be avoided by judicious planning. Teaching could not be efficiently carried on in proximity to the incessant noise and dust arising from traffic upon a main road. The neighbourhood of factories, mills, electric light and power stations, railways, tram-lines, and similar noisy and dusty situations, should be avoided when selecting a site for school buildings.

The playgrounds in this country compare favourably with those in the large cities of America. A larger proportion of the space than is usual should be covered in and ventilated at the top, especially for the juniors, so that most of the games could be carried on regardless of wet weather. The surfaces of all playgrounds should be smooth without being slippery, and formed of materials, such as asphalt or good granolithic cement, which do not work up into dust. The surfaces should also be compact, so that nothing adheres to the boots, durable, not liable to be kicked up or worn into holes, and well-drained. Gravel, cinder-ashes, shingle, and loose materials are unsuitable.

In elementary schools sanitary conveniences were usually placed some distance from the school building proper in a corner of the playground, and children must pass through the open air to reach them. This arrangement was seldom found, except in this country. It had long been generally abandoned for girls' secondary schools, although in some modern schools of this type he was sorry to say it was still found. So long as these conveniences were under reasonable supervision, and were disconnected from the school proper by a well-ventilated lobby or covered way, no danger to health could arise from connecting them to the school building, and the hardship of sending children, especially juniors, out from warm classrooms in wet and cold weather could be avoided.

In the recent rules for secondary schools the distance apart for the cloak-hooks was fixed at 12 in., i.e., double that required in elementary schools. If 12 in. was a reasonable minimum distance for cloak-hooks for the garments of the well-cared-for, surely a distance of only 6 in. was insufficient for the poorer and probably much damper clothes of umbrella-less children. Moreover, the official 4 ft. gangways were too narrow, especially for the use of girls; the floor-space should be further increased to give better means of access to the clothes and space for dressing. In secondary schools still more floor space was required for seats and boot-leaves; 6 ft. was found to be a reasonable width for these gangways, which should never be less than 5 ft. wide from centre to centre of stands. Each gangway should have an external window at the end, and all parts should be well lighted when the children were present. To ensure this it was desirable that the rooms should not be less than 9 ft. high. A suitable position for the cloak-room was near the entrance; good discipline and a liberal allowance of scrapers and rubber mats at the entrances and near the cloakrooms would prevent much boot-dust from the outside reaching the interior of the school. Polished floors throughout the building would then be possible, except, perhaps, in the cloakrooms and entrances, where jointless impervious floor surfaces, such as asphalt or granolithic cement, would be more appropriate. Wax polishing wood floors cost no more to maintain in good condition than washing the floors with water, which softens the wood and makes it less durable.

Whatever method of ventilation was used, all schools should be designed to allow large volumes of air to pass through the buildings from side to side when the windows were open, so that all parts could be readily swept by currents of fresh external air whenever desired. Windows were perhaps the most important and permanent means of securing ventilation in all buildings for educational purposes. When the windows were suitably designed and intelligently used in connexion with two or more outlet flues from the ceiling and floor level to

above the roof, and there were also large open ventilating fire-grates, stoves, and radiators, by which warmed fresh air was admitted to the rooms, long experience had proved that classrooms could be reasonably, adequately, and economically warmed and ventilated. In large manufacturing cities and towns afflicted by dust or fog, windows admit, with the external air, so many of the impurities which pollute it, that there was some excuse for keeping them closed on the plea of cleanliness and good reason for making arrangements to wash the air and force it into and through the schoolrooms by artificial means. Fans and other appliances had proved very useful for crowded places, factories, etc., but the scientific adaptation of them to school buildings was in the experimental stage at present. Improvements might reasonably be expected, in the near future, in the application of mechanical means of ventilation to large schools, which would lessen the objections now existing to many of the imperfect attempts to introduce air by machinery and close the open windows of schools. The aim of the sanitarian should rather be directed to restrict the causes which deteriorate the air of cities and large towns than to encourage the boxing-up of children in a series of sealed cells and the pumping of air specially prepared for indoor consumption.

Ventilation of Schools.

Mr. A. F. Somerville read a paper entitled "Some Suggestions for the Better Ventilation of Schools" in the course of which he said:

With regard to schools which have been built for ten years and longer, it will, I think, be admitted that, in the case of the majority of these schools, they have been built without any definite ideas as to ventilation or temperature, and, in many instances, with very crude ideas on the equally important question of efficient sanitation. With regard to more modern schools, though there has undoubtedly been an improvement in both ventilation and sanitation, still few schools show that these two matters were a first consideration in their construction. An attractive exterior rather than a thoroughly healthy interior has been the chief aim of the school committee and their architect—though, in justice to some architects, I admit that the architect has had at times to give way to meet the requirements of the school committee. . . .

In Chapter III. of the code there are to be found general rules with reference to the questions of accommodation and equipment, but it seems to be left to H.M. Inspector and the "responsible officer of the local education authority" to decide whether or not the requirements of the Board of Education, with reference to these two matters, which include ventilation, heating, and sanitation, have been complied with. Now, sir, I will ask you whether, if you were building a house for your own occupation, you would be prepared to submit the question of its ventilation, heating, and sanitation to H.M. Inspector having control over the district, and the "responsible officer of the local education authority"? If you would not do this with regard to your own house, what right has the Board of Education to entrust these important matters affecting the health of thousands of children to gentlemen, who in their own departments are no doubt experts, and fulfil their duties with ability, but who have not had that training which renders them capable of being considered experts in matters of hygiene? . . .

To descend, however, from generalities to details: I find that the recognised accommodation of a school may from time to time be revised by the Board of Education, but there shall in no case be less than 80 cubic ft. of internal space, and 8 sq. ft. of internal area for each unit of the number of children in average attendance for which the school is recognised. I have not been able to find that any rules have been laid down regulating the internal space and internal area in schools, other than elementary. In Miss Alice Ravenhill's most interesting report on schools in the United States of America (*Journal, Sanitary Institute, Vol. XXIII, Part I.*) it is pointed out that in the New York City schools the internal area or floor space for each child is 12 sq. ft. (as compared with the minimum of 8 sq. ft. allowed here), and in the normal schools the internal space varies from 240 to 270 ft. cubic, with an internal area of 20 sq. ft. per pupil. But there is a further important provision in these schools, that each pupil shall receive about 2,000 cubic ft. of fresh

air per hour. Whether or not the minimum laid down by the Board of Education, viz., 8 sq. ft. of internal area and 80 cubic ft. of internal space is sufficient, is not so material as the question of the minimum of fresh air which each child shall receive per hour. . . . Some people think that doors, windows, and an open fireplace are all that is necessary; those are the people who can sit in a draught and enjoy it. I don't like those people, and don't want to live with them. By all means let every door and window be open when the school is empty; and in the middle of summer, when the temperature of the outside air varies but little from that of the schoolroom, windows may be freely opened, but proper ventilation should be free from, and prevent draughts. . . .

Sufficient fresh air should be introduced, and, when feasible, filtered, and at a proper temperature, and at the same time the foul air extracted. Attention should, moreover, be particularly directed to the large window space, a constant source of draughts in schools as well as in churches. The warm air of the classroom coming into contact with the cold window becomes chilled and falls; and, when the temperature of the outside air is very low, the chilled air inside falling rapidly creates a serious draught. In America and in other countries, where the winter is very severe, it is found necessary to have double windows. To provide our schools with double windows is neither necessary, nor for several reasons would it be desirable. A probable remedy, in schools which are heated by hot-water pipes, might be found by placing one of the radiators underneath the windows, or else, by having a slit in the window sill connecting with the hot-water pipes, so that a current of hot air passes continually up the slit and against the window. To prevent dust passing up also the air might be filtered through a slide, covered with muslin, at the mouth of the slit. . . . Now as to the remedy. In the first place, it must I think be admitted that ventilation is a far more difficult subject to deal with than questions of drainage, which latter, thanks to modern research and well-tried systems, can be efficiently and effectively settled. . . . In well-managed dairies the temperature is noted and registered daily, and in the same way it would be easy to keep a daily record of the temperature of the school and classrooms at the commencement of the school, before the interval, and before the close of the school. This should be some guide as to whether attention is being paid to heating and ventilation. Thermometers should be kept in every school, and their proper position fixed. In those schools where complaint is made of serious defects in ventilation, it should be possible to obtain a sample of the air, so as to ascertain the proportion of CO_2 present. The question of ventilation and sanitation should be left to properly qualified persons, and not to H.M. Inspectors and the "responsible officer of the local education authority."

With regard to existing schools, I would deprecate any attempts to insist upon an immediate large expenditure to remedy defects, for the unfortunate ratepayer must be considered; but in many cases much improvement might be effected at a slight cost. Tobin tubes, with a sufficient length of shaft to prevent a draught, a board under the lower sash of a window, and similar simple methods will materially assist the entrance of fresh air, and Boyle extractors on the roof aid the expulsion of foul air.

In the case of new schools to be built in the future, proper ventilation should be insisted upon, and I would further suggest that it is not sufficient merely to examine the plans, but there should also be an inspection of the site and surroundings before the proposed system of ventilation be approved of or condemned. . . .

Mr. Whittaker (Chairman of the Council of the Royal Sanitary Institute) said that when a local authority wanted an independent report on an engineering matter it appealed to the President of the Institution of Civil Engineers, who sent down an engineer absolutely unbiased. Some time ago a populous borough wanted an independent report on a school, and they appealed to the Sanitary Institute, who sent down a gentleman, and he had reported. That was a way in which the Institute could help local authorities. He felt they ought not to grudge the expenditure of a few pounds in making their public buildings—whether schools, police-stations, or fire-stations—handsome.

Mr. W. Langbridge, as an elementary teacher

in charge of a slum school in the East-end of London, welcomed the efforts made by the Institute to improve the hygiene of schools. What was greatly wanted in such a type of school was a large hall for exercise in wet weather.

Dr. Geo. Reid (Medical Officer of Health for the County of Staffordshire) said the great difficulty in dealing with school construction was that of ventilation. He felt that mechanical ventilation was not only expensive, but was bad from the point of view of education; but it was essential that children should learn the value of fresh air in their own homes. He believed the time was coming when schools would be constructed practically like hospitals, with windows on both sides, not opening into a corridor, but into the open air on a verandah by which the children could get from one room to another.

Miss A. Ravenhill referred to the excellent system of school baths in operation at Amsterdam. There one school bath centre served a considerable number of schools. The plans would, she believed, be published in next week's *Builder*.

Dr. T. Lyon thought it was absolutely impossible to have the open window system in schools. While a certain amount of air was necessary for breathing, ten times as much was necessary to purify the room.

Dr. Hayward (Medical Officer of the Wimbledon Education Authority) dwelt on the need of securing better seating arrangements in schools.

On the motion of the Chairman a vote of thanks was passed to the readers of papers.

The conference was resumed and concluded on Friday, the subject of the day being "Training in Hygiene."

THE INCORPORATED CLERKS OF WORKS' ASSOCIATION.

The twenty-second annual dinner of the Incorporated Clerks of Works' Association of Great Britain was held at the Criterion Restaurant, W., on Saturday last week. Mr. J. S. Gibson presided over about 330 members and friends, including Messrs. J. Carmichael (President of the London Master Builders' Association), J. Hutton Freeman, S. Young, J. C. Hill, A. Ritchie, W. Woodward, J. Aitchison, J. Brady, J. Davies, A. Fincham, D. W. McInnes, W. Pitts (President), and J. Pain (vice-president, hon. secretary, and treasurer).

The loyal toasts having been honoured, Mr. J. Davies proposed "The Architects and Surveyors," and, in doing so, said that the industry of building—architects, surveyors, and building trades—was a very ancient one. He held in his hand an ancient code of building laws found last year and known as the code of Hammurabi, King of Babylonia, about 2250 B.C. There was evidence from that code that there existed a building trades industry, and it had to be dealt with in a statutory way. Jerry building was not an unknown practice in those days, for it was stated in the code that, if a builder built a house—nothing was said as to architects and surveyors—and the building fell down and killed a man, the builder was put to death. They would all agree that that was very concise and straightforward, but now architects in the proper sense of the word had come on the scene. The earliest reference to the surveyor that he could find occurred on a tablet found at Pompeii. The architects of to-day had a grand opportunity of embodying the sentiments and aspirations of the nation in stone, and of showing future generations that the people of the XXth century had an object in view, and that they had achieved it in stone.

Mr. W. Woodward, in response, said there was another law in the code referred to by Mr. Davies which was very interesting to architects. It was law 233, which read:—"If a builder builds a house for a man and does not make its construction meet the requirements and a wall falls in, that builder shall strengthen that wall at his own expense." That suggested to him a very important matter. He reminded them, as men who had to carry out building requirements in London, of what it meant to "meet the requirements" in London. An architect about to erect a structure had first to meet the requirements of Spring-gardens, and if there was an architect present or in London who could meet the requirements of that body in the course of, say, six months after having deposited a few hundred drawings and attended at Spring-gardens a few dozen times, then he was a very fortunate individual. After the requirements of the

L.C.C. were met, there were the requirements of the Borough Councils—not only their practical requirements, but their fads, which were numerous and exasperating too. Then there were the requirements of those men whom they all honoured in their works—i.e., the district surveyors—but there were district surveyors and district surveyors—district surveyors who read a certain clause of the 1894 Act in one way and another set who read it in another—men who helped the architect and the clerk of works and men who hindered their progress all they could. Then there were the requirements of the adjoining owners—men who thought that their rights of light were going to be injured, and who, until the case of their friend, Mr. Howard Colls, was taken to the House of Lords and decided, were able to stop a magnificent building going up because they contended that some insignificant light was being injured. As Mr. Davies said, there were unquestionably great opportunities for architects nowadays. An architect erected a building which was an honour to the profession or the reverse, and which was more or less a permanent structure. If unpleasant, it could not very well be removed, whereas the work of the sculptor or painter could be; but, all things considered, he thought that there was considerable hope for architecture. He believed that that architect was much better able to carry on his work who had a knowledge of quantity surveying, or who, in his early days or later, had practised as a quantity surveyor, than the man who had not. As to the clerks of works or builder's foremen, he made it a point at the first introduction to say to them, "You are going to be devoted to this one building; I have other buildings to attend to; whatever suggestion you can make to me—if you can see anything wrong in the drawings or anything you can add to the specification, or any improvement to the design, even, I shall welcome them, and, if they meet my approval, I will adopt them." He had had suggestions from clerks of works even to the improvement of his designs, for which he was personally grateful.

Mr. S. Young having briefly responded for the surveyors,

Mr. J. Aitchison proposed "The Worshipful Company of Carpenters." In the course of his remarks he referred to the great benefits the Company had, by their classes and lectures, conferred on the young men belonging to the trade. He often thought that young architects might with advantage join these classes and so get a practical knowledge of the trades connected with architecture. The Association was indebted to the Company also for the use of a meeting room, and they in return assisted them in their practical examinations.

Mr. J. Hutton Freeman, Clerk of the Company, responded, and said it was not quite right to say that young architects did not attend the classes of the Company. A great many young architects attended the classes at King's College and University College, and they came occasionally to the lectures. The classes at Titchfield-street were intended more for the men actually engaged in the various trades. It was the intention of the Company to bring forward as much as possible the question of forestry, and a lecture would shortly be given in their hall on the subject. Later in the year the Company would hold an exhibition of woodcarving and works in wood, and prizes were to be offered both by the Joiners' Company and the Carpenters' Company for good work done in classes.

The Chairman then proposed the toast of "The Incorporated Clerks of Works' Association of Great Britain." He was glad to see present so many gentlemen interested in building, for it was the spirit of co-operation amongst all the different branches of the building trade that would help to make the buildings of the XXth century memorable in times to come. As to the antiquity of the calling of architects and builders and the existence of jerry-building in the remote days referred to, it would probably have been a great advantage had clerks of works, with their judgment and experience and knowledge of the best materials to use, been employed at that early time, for we should not then have had great historical buildings which to all appearances were monuments of solidity and strength proving to be, after the veneer was taken off, largely composed of materials that were quite unworthy of the building. It was a great advantage to the architect to have clerks of works to devote attention to the

development of his designs and to see that the right materials were used and used in the proper manner, and the architect relied on the trustworthiness and integrity of his clerk of works to carry out his ideas in the best manner possible. The Association was founded and was carried on for the purpose of intercourse between its members, and that in itself was a good object, for there were many questions which arise in the requirements of the day which demanded a great deal of study and thought. There were many difficulties which occur in large modern buildings, and this intercourse was of great value to clerks of works and others; it enlarged their experience, and when difficult problems came up they could take the advice of their friends and meet together and talk matters over, and probably find a way out of difficulties. The Association was also founded for the purpose of obtaining employment for its members by other means than by advertisements, and he hoped they would always be successful in that object. Building was not one of the exact sciences, like mechanical engineering and chemistry; it was subject to a great many developments and occurrences which were not evident to the mere drawer of plans and arose out of peculiarities of site and as the building proceeded. He was glad that it was so, for were architecture reduced to an exact science it would be very much more uninteresting than it is. He liked to see drawings well and clearly made, and he also took advantage of hints as to improving designs from, and the knowledge of, clerks of works; but he did not like the clerk of the works who was continually pushing himself forward—who wanted to write the specification, make the details, and measure up the variations, and generally carry the whole job on his own shoulders and the architect as well. He was one of those architects who preferred to do a little, at any rate, of his own work. He had always insisted on writing his own specification, and, as a young man, he had a good drilling in specification writing. He did not think it pleasing work at the time, but he had found it of great advantage later in life. The Association should cultivate the spirit of comradeship among its members. Nothing would tend more to raise the status of clerks of works than the knowledge that they were all good friends of each other, that they were helping each other on to a greater knowledge and experience in their work. The Association was incorporated in 1882, and its membership had continually increased, but he wished that the membership would increase faster and as it ought in a great country like this, and especially in a great city like London. He was glad to know that it was the intention of the Association to institute a benevolent fund, for nothing would help to widen and broaden their influence more than the fact that it would take care of those who had been less fortunate and unable to make provision for old age. He hoped that before another year had passed the fund would be started on a business-like basis. There was also a library in connexion with the Association for the use of the members, and that was a good thing; but, while it was necessary that they should be well up in the standard works on which their knowledge was based, it was still more necessary that they should cultivate that practical knowledge of work beside which book-learning was really of little account. In his own office he always insisted on his draughtsmen and pupils spending a large part of their time on works, for it was easier to get knowledge that would last in that way than by reading about it. He did not like the idea of young architects being trained in the idea that they were mere drawing-machines. He preferred that they should take a building under their care, seeing it through from beginning to end, and that was an advantage to the architect as well as the pupil. He did not like a clerk of works, for instance, to turn up his specification when asked a certain detail, he expected him to know the specification thoroughly, for it was his business to do so, and generally he was not disappointed in these clerks of works with whom he came in contact.

Mr. W. Pitts, President, in reply, said that, as to the benevolent fund, he had in his pocket a scheme which would be laid before the Association on Monday and which he hoped would be carried.

The toast of "The Press" having been honoured (proposed by Mr. J. Brady, Editor of the *Clerk of Works' Journal*),

Mr. A. Fincham proposed "The Visitors," coupled with the names of Mr. J. Carmichael

and Mr. J. C. Hill, of the London Brick Company, both of whom suitably responded.
The concluding toast was "The Chairman," proposed by Mr. D. W. McInnes.

THE SURVEYORS' INSTITUTION.

The usual fortnightly meeting of the Surveyors' Institution was held on Monday at No. 12, Great George-street, Mr. H. T. Stewart (President) in the chair.

The Secretary announced that the name of Mr. W. H. Theobald had been placed on the balloting paper to fill the vacancy on the Council caused by the death of Mr. Thos. Blashill.

Urban and Rural Building By-Laws.

Mr. W. Woodward, in resuming the debate on the papers read by Messrs. A. R. Stenning and P. Menzies on "Urban and Rural Building By-Laws," said that if Sir Wm. Grantham had not done any other good in connexion with this matter he certainly had very forcibly drawn public attention to the growing necessity there was of placing a strong curb upon the controlling authorities of the country. During the last fifteen or sixteen years they would doubtless all have observed the tendency on the part of the constituted authorities to interfere with regard to building matters quite unnecessarily so far as public health and well-being was concerned. Since the proceedings by Sir Wm. Grantham there had been newspaper criticisms and accusations that the real object of the opposition to the by-laws was that landlords and property owners should be able to secure jerry-built dwellings for the working classes. He believed that was a gross libel which they need not take the time to contradict. In his opinion there was a desire on the part of every architect in the country to act in the interests of his client, and there was every desire on the part of property owners who wished for the welfare of the working-classes to build healthy cottages. What, however, they did not want was an interference which unnecessarily increased the cost of the buildings without giving any corresponding benefit to those who would occupy the dwellings. It had been said very properly that every power given to a constituted authority meant the taking away of a corresponding liberty from the subject. He felt that Mr. Stenning had arrived at some practical conclusions which would be for the benefit not only of architects and surveyors, but also of the constituted authorities. Mr. Stenning said all he required was (1) minimum size of rooms; (2) stability of structure; (3) sufficiency of air space about buildings; (4) good drainage and sanitary provisions; (5) internal ventilation; and (6) width of roads and lines of frontage. These were the chief lines on which dwellings in rural districts could be made habitable and healthy homes. Even if they took the speculating builder they knew it was to the interest of that gentleman to put up buildings that would let readily. He did not see why the speculating builder should be ridiculed, for he only desired to get some margin of profit over his outlay, and he would find, as they found in London, that if he did not put up respectable buildings his dwellings remained unlet. Mr. Menzies said that all he wanted was stability and provisions as to fire and the general purposes of health, and he put forward one or two practical suggestions which landlords would do well to follow, and which they in London had to follow under the provisions of the London Building Act of 1894. He thought the suggestion of a layer of concrete over the surface was a necessary requirement, as it kept off damp. Even when there was a gravel soil that was a good provision. Mr. Menzies also proposed horizontal damp courses, which he (the speaker) thought should be insisted on, and also vertical damp courses, which they were compelled to provide in London when any part of the building was beneath the ground line. Mr. Menzies also suggested coping of parapet walls, and these were practical suggestions which he felt were all that were necessary so far as the controlling authorities were concerned. Mr. Arthur Vernon, who had great experience, had given some practical suggestions and also thought the mischief had arisen by attempting to adapt the London building by-laws to the country. There was no doubt that a good many of the by-laws of the Local Government Board were taken from the London by-laws. Mr. H. Smith was quite right in saying that the building by-laws caused ugly erections. In place of the

picturesque whole or half timbered houses they had in many cases barrack-like buildings. As regarded that, they had only to remember the terrible effect of the requirement of the angle of 63½ deg. required by the Building Act of 1894 in London. That was responsible for much of the prevalent ugliness, and he hoped in the Amending Bill that unfortunate clause would be struck out. Mr. MacMorran, K.C., gave them some very practical suggestions, and said the time had come when there should be a building code which would be understood by the people. Mr. Elwes had pointed out the extra cost of building due to the ridiculous by-laws. They all knew that the idea of fire was a totally exaggerated one. The cry for all these fire-resisting and fireproof dwellings, which added to the cost, was due to some poor persons having been burnt, but if they were always to proceed on that principle they would never go into the streets at all for fear of being run over. As to air space about buildings, it was suggested at a recent meeting of the Royal Institute of British Architects that so long as air space was round a building it did not matter whether it was at the rear or not. Mr. Williams had spoken on the other side, and said he wanted good houses for the workmen and also cheap houses. He (Mr. Woodward) contended that the enormous increase in the cost of building was due to the organised idleness and terrorism of the workmen themselves. In his experience building had gone up 25 to 30 per cent. in price owing to this cause. Mr. Williams said every room should contain 1,200 cubic ft. of air space. Well, he had measured the rooms in his own house at Hampstead, and found one, which was 15 ft. by 11 ft. and 7 ft. high, gave 1,155 cubic ft., and he felt that was a fairly good-sized room. He would like to refer to the Building By-Law Reform Association. What that Association required was a short Act of Parliament containing general clauses dealing with width of way, line of frontage, open space about buildings, and as to water supply and sanitation; and he did not see the necessity for any by-laws at all or for the existence of the Local Government Board. He trusted that the papers and discussions would lead the public to awake from the apathy which had resulted in what they all deplored, and that as the results of the proceedings by Sir Wm. Grantham they would get healthy buildings without restrictions.

Mr. E. W. Hudson said they all agreed that there was a strong necessity for minimising and moderating the by-laws as they at present existed, and he felt sure that that Institution, in conjunction with the Royal Institute of British Architects, could in a short time put forward such a code as would be acceptable to the Local Government Board, the architects, and the public. Reference had been made to the ill-results of the small voter having the choice of officials, but he did not think that was general. He, personally, had not found that a practical man raised by self-help to an official position was any more difficult to deal with than some of those gentlemen who wrote initials after their names. If the country gentry would only give up some time to join in the work of some of these local bodies they would be able to control as far as necessary those other members who might not have had the very great advantages of education. He felt himself that the views adopted by these local authorities were the official views, and that very rarely had members axes of their own to grind. Certainly he felt that a man's origin should not be dragged into the question of whether he performed his duties. As had been well said, "He who debases my rank exalts my character." He thought Sir W. Grantham's counsel took an objectionable method of dealing with the professional witnesses before him in the case which was fought. He did not hesitate to say that some of the best surveyors in the old vestries were self-made men. As to the plans which gave rise to this agitation, he was very doubtful whether any member of that Institution would have expected them to have been accepted by any local board in the country, or would have accepted them himself had he been an official in office. It would really seem to the ordinary individual that there had been a great deal of pique introduced into the matter, and he could not, for one, understand why a simple plan should not have been drawn up which would have satisfied any reasonable official. Rightly or wrongly the by-laws were the law of the land, and until they were superseded it was the duty of those

in authority to see that they were carried out. It was not always the rustic officials who gave difficulty to architects. He remembered many years ago, for some extraordinary reason, Sir E. B. Dennison was appointed Diocesan Surveyor for one of the Northern dioceses, and architects had to submit plans to him. Whether the architect was an eminent man or a fledgling these plans always came back with the remark, "This is wrong," or "That must be altered, see my book on building, page so and so." If any gentleman there felt exalted in his profession let him get a copy of that book and read it, and if he was not then a humbler man he would have read it in vain. Mr. Stenning had suggested uniform by-laws, but he did not think that right. What would make a dry and satisfactory building on Tunbridge Wells Common would not do in the Lake District or in Ireland, where the rainfall was much greater. He quite agreed with Mr. Menzies that there should be a concrete platform. As to materials, match-board lining was objectionable for sanitary reasons, but with overhanging eaves plaster might be used. Plans ought not to be demanded for retention, but a block plan ought to be supplied for inspection. He thought there would be no objection to tribunals of appeal where there was any disagreement as to the meaning of any particular by-law. Mr. Vernon referred to party walls coming above the roof, and it was absolutely impossible to keep out the wet with brick parapet walls. There was only one way to do it, which was to run off the walls and cement down to the slates. Barge boards and wooden bays should be allowed. He noticed that Mr. Williams was proposing to carry a deputation to the Local Government Board in favour of by-laws. He felt that no one would advocate the abolition of all by-laws, and therefore he could not see the necessity for such a deputation.

Mr. J. L. Crouch said that Mr. Stenning thought it desirable to have one uniform set of by-laws applicable alike to urban and rural districts, but that the by-laws should be modified or altogether relaxed in the case of rural cottages with a view of lessening the cost of building labourers' cottages. Personally he should think that the task of drafting such by-laws was much less easy than seemed to be thought. Assuming that the draft was complete, then the more formidable task of obtaining Parliamentary sanction would have to be faced. It seemed to him perfectly clear that the Local Government Board could not enforce a code at present. Up to now no one had spoken favourably of the present state of things, and a change seemed to be unanimously desirable. Mr. Stenning was satisfied with suggesting that a code was necessary, but very wisely he did not produce any code or put before them any details. If he had done so, he (the speaker) felt from the remarks which had fallen that they would be a very long time discussing such a code. With regard to the relaxation of by-laws, Mr. Stenning had mentioned certain sub-sections of the London Building Act which gave exemption from clauses of that Act, and he suggested that certain property in the country should be exempted in the same way. While he saw no objection to that yet he hardly agreed with the way in which Mr. Stenning had put it. Mr. Stenning would allow property to be built of any material provided that it was built 30 ft. from adjoining property, and 15 ft. from an adjoining owner. He (the speaker) thought that would work unfairly to the adjoining owner. Suppose that owner wished to put up a permanent building right on the boundary of his land, he would only be 15 ft. from the temporary building, and therefore he would not be able to comply with the by-law. The consequence was that the man who wished to put up the permanent building would have to build 15 ft. from the boundary, and he hardly imagined that such a proposal as that would ever pass. He could not imagine owners desiring to put up permanent buildings being penalised in favour of owners who wished to put up a temporary building. The special idea of the papers was, he took it, to cheapen the cost of erecting buildings in the country. Mr. Stenning would allow a building which had 30 ft. space on either side to be built of any material, but he would go much further than that. If they were near a town the cost of the necessary land to give this space would take away all the advantage of any saving in the

material. In the country it did not much matter whether the thing was much cheaper or not, for there was little chance of anyone except a landowner building cottages, and certainly as a speculation they would not pay. A cottage let at 3s. a week would be worth 80% or 90%, and they might relax the by-laws as much as they liked, and then they could not build at the price. Personally he would allow the landowner to put up as many cottages as he liked in a row. Why should they not put up a row of timber cottages so long as the cross walls were of brick? There would be a saving in the case of a row of cottages, but where only one was being built the saving would be very little if any. Mr. Stenning suggested a tribunal, but he (the speaker) did not think they stood the slightest chance of getting a tribunal to judge of the suitability of buildings in a particular district. He had not had any trouble with the District Councils, but he had had trouble with the surveyors who very frequently were quite incompetent. He met one not long ago who was a retired policeman, and knew nothing about building. If they had a tribunal he would suggest the abolition of the surveyor to the Council. At the present time the Council surveyor was appointed at a small salary, and considered himself the advocate of his employers, and if there was a tribunal he could more than ever consider himself an advocate. District surveyors ought to be wholly independent of the local authority, and should hold an impartial position between the Council and the person building. They had Sir Wm. Grantham with them that night, and no doubt he would be able to explain why he did the architects and surveyors out of work by preparing plans himself.

Mr. Martin Vigers thought by-laws, both urban and rural, should give the owner the right to dispense with concrete on the surface, provided he constructed the lowest floor of concrete. There should, of course, be sufficient space for ventilation, and that should be obtained either by gratings or air bricks. The floor would be covered either by boards or blocks. He ventured to suggest that houses constructed in this way would be dryer, warmer, and more healthy than those having a layer of concrete practically on the soil, with a boarded floor above the concrete. As regarded the superstructure, he felt it would be going too far to say that there should be no by-laws. He would permit wooden cottages, provided that the walls were plastered. As to width of roads in rural districts, he would suggest that 30 ft., including pathways, was sufficient, and not too much.

Mr. R. M. Chart, who for over twenty years has been surveyor to the Croydon Rural District, said that that district was the largest so-called rural parish in England, but a part of it was only rural in name. He agreed that the model by-laws were not suitable for rural districts, but it would be a mistake if in the urban district there were only rural by-laws applied. While they desired that facilities should be given for the more economical construction of cottages in rural districts, they must not forget the evils which led up to the passing of by-laws. They knew that in rural districts adjoining towns houses were being erected by unscrupulous persons which were calculated seriously to affect the health of the occupants. It must be admitted that the by-laws had done much to remedy these evils. He disagreed with the author of the paper that the model by-laws did not require plans to be submitted for additions to buildings. And as to the width of new streets, he would point out that no one knew what use a street would ultimately be put to. He agreed with the suggestion of Mr. MacMorran that there should be a code applicable to the country at large, and that special by-laws should then be made for urban districts. He also felt that local surveyors should be appointed by the Local Government Board in the same way as medical officers of health and sanitary inspectors, and he believed that many of the grievances arose from the miserable salaries offered by local authorities, which prohibited the engagement of good men.

Sir Wm. Chance said that having been a sufferer he had come to take interest in the reform of the building by-laws, but felt that those who were asking for reform should be much kinder to the Local Government Board and the District Councils. No doubt the by-laws were constituted to remedy evils, and there was a tendency in trying to get rid of one evil or rush to the other extreme. It had been suggested that they might draw up a code

containing principles of construction and sanitation, and leave the details to some competent authority. He felt they would find it difficult to draw up principles and to separate principles from details. Another way to deal with the question might be to provide exemption clauses, but he was afraid that Councils who had already got by-laws would not agree to that. He thought it would be possible to draft a Bill which would allow a house to be put up with any material so long as there was a certain space round it, and the space might depend upon the height of the building. A great advantage of such an Act, as that would be that it would encourage gardens, and another that it would deal with urban and rural districts alike. He was told that under the Building Act of London if a person liked to buy sufficient land he could build exactly as he liked, and that ought to be the case in the country.

Mr. C. J. Mann said he thought the discussion showed that an amendment of the by-laws was necessary, and they were greatly indebted to Sir Wm. Grantham for making it the pressing question of the hour. The regulations for which special attention was required were the lines of frontage, new streets, stability of buildings, prevention of fires, air space inside and outside buildings, drainage, and ventilation. It happened that often they could not use the materials which were in the district, owing to the by-laws, and that was a great hardship. With regard to the prevention of fire, many of the provisions were very costly and quite unnecessary. As to sanitary matters, they found a rural district suddenly called upon for a large and costly drainage scheme, before the place was ripe for it, and he thought such schemes ought to be carried out by degrees. He deprecated building without plans, but plans for cottages should not require specifications other than might be written upon the drawing. He felt it would be a good plan to make the by-laws as general as possible for all districts.

Mr. W. A. Casson said that for fifteen years he was in charge of the By-Law Confirming Department of the Local Government Board, and had seen thousands of by-laws from all parts of the country. For years he had been in daily consultation with Mr. Percy Gordon Smith and the late Sir R. Thorn-Thorn, who made the building up of the system of by-laws which now governed the country the aim of their lives. The view they took was that in making by-laws it should be easy for those engaged in building to see what they were driving at, and that the point to bear mostly in mind was the health and comfort of those who had to live in the houses. When they came to close quarters they would find the by-laws were not such terrible things as they were made out to be. The model by-laws could be adapted to local needs, and it rested with the public at large to impose on their local authorities the conditions required. He wished to say one word in defence of rural district councils at large, and the Chislehurst District Council in particular. When that Council were seeking to make by-laws they were not free men, doing what they liked with their own, but they were subject to the approval of the Local Government Board. He felt, therefore, that they ought to attack the Local Government Board, and go to Parliament for a remedy of the grievances they were suffering from. The Chislehurst District Council did no more or no less than any local authority would have to do in the country. So long as it was the law of the land it had to be complied with, and with all respect to Sir Wm. Grantham, it would have been better if an example had been set of compliance with the by-laws rather than its worst. He felt that a society like the Building By-law Reform Association could do great good by finding out where the by-laws failed; but what they wanted was a Royal Commission to inquire into the working of by-laws all over the country.

Mr. J. H. Horsfield, speaking as an architect and surveyor for a District Council, and as a member for some years of a Corporation, said his experience was that District Councils had to accept the by-laws of the Local Government Board in their entirety. It was said that corporations had no dispensing powers, but practically they had. A question was put to the Committee of the Corporation, and was either carried or rejected, and there was no uniformity of practice. If they had a tribunal of appeal they would not want to refer to it very often, because so soon as a corporation

knew that there was such an authority they would be very careful in what they did. As to the width of roads, he certainly thought in towns they ought not to be decreased, but in the country it did not matter very much. One point which had not been touched upon was that of building houses for the working classes. The cheapest house that could be built was a terrace house, but when they came to do that the building laws would not allow the drainage to go through the houses, and said they must have a road 13 ft. wide at the back to carry the drains. If they had to make that road the profit returned on such a class of house was not equal to that from Councils.

Mr. W. J. Jennings disagreed with Mr. Stenning as to compulsory by-laws for local authorities being uniform throughout the country. If they were he thought there would be greater hardship than at present. Some years ago in Canterbury they had by-laws which met their case very well. Then when they applied for a loan the Local Government Board came down and held an inquiry, and refused to grant any further loans unless they modified the by-laws. They sent by-laws to the Local Government Board and had them returned, and practically they were forced to adopt the model by-laws. That was a great disaster to Canterbury, where many of the best streets were narrow and many of the building plots were narrow, which made it impossible to comply with the model by-laws. The result was that they got over the difficulty by building houses in two or three parts. They never had any new buildings in Canterbury, and so they escaped the by-laws altogether. He welcomed the idea of a tribunal of appeal, and he also thought there should be better qualified men as surveyors.

Sir William Grantham said he would not have spoken but that he was anxious to take some public opportunity of thanking that great body of surveyors for the interest they had taken in his case and also the trouble they had taken to do what he thought would be of lasting benefit to this country, viz., getting some modification of the existing building by-laws and as to the methods in which they were carried out. He was rather amused with Mr. Crouch, who asked him a question as to why he robbed the architects and surveyors of some portion of their livelihood. He could give a very good excuse. If any of them wanted a pleasure—if they wanted to eat a dinner, they did not want to eat it vicariously; they wanted to eat it themselves. If they wanted to go to the theatre, they did not want that pleasure through somebody else—they wanted to go to the theatre themselves. With regard to his preparing his plans, the simple fact was that he was fond of it. He had been doing this work practically all his life, and he had never had a proper surveyor's plan prepared. None of the builders he had employed in the country could prepare one, because they were all local builders, and were not capable of preparing a plan which would pass the Surveyors' Institution. But they all did their work very well, and the plans he got out were sufficient. They were just rough sketches to show what was proposed. He was driven to build himself because, unfortunately, he could not get other people to do the work as he thought it ought to be done, and he just drew up a sketch which was quite sufficient for his own men to work from. Cottage building was not a paying operation—it was not a desirable investment—but it was more or less a philanthropic duty, if he might put it like that, and it was always desirable where possible to make a pleasure of duty. It was always a pleasure to do the whole thing oneself. Thanks to information he had obtained from architects and surveyors during the many years he had fought for them and against them at the Bar, he had got to do all that was necessary for his own purpose, and so far they had always worked out quite satisfactorily. That was why it was he had gone on in the same way, and he hoped to continue, notwithstanding the existing by-laws. There was one thing which he thought was the basis of all suggested alteration—that of appeal. He had no doubt whatever if they had a properly constituted court of appeal there would be very little difficulty left. He did not agree with the formal court of appeal suggested by Mr. Stenning, but he would have the right of appeal to the County Council, or County Councils, as a rule, were composed of first-class men, and they had good, honest, skilled surveyors. They could afford to pay a higher price, and could therefore get better men.

ARCHITECTURAL SOCIETIES.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—At the rooms of this Society on Thursday, the 8th inst., Miss Ethel Charles, A.R.I.B.A., read a paper on "Modern Architecture in London," Mr. G. B. Bulmer, F.R.I.B.A., President, in the chair. The President, in introducing the lecturer, explained that Miss Charles was the only lady Associate of the Royal Institute of British Architects. The lecturer said that London was said to contain more bad work than any city in the world for its size, though it contained some of the finest buildings in existence, but that most of these buildings had been erected during the last thirty years. Art in architecture was certainly advancing. Salt-glazed bricks were not used nearly enough, as they kept their colour and did not collect the dirt and grime like stone and brick. Slides were shown on the screen of New Scotland-yard, National Liberal Club, City of London Schools, London School Board offices, and many others, which illustrated how the general tendency of modern work was to experiment rather than to rely on tradition, how modern work was personal rather than national, and was characterised by endless diversity; and this diversity was further intensified by the complexity of modern life and modern requirements, and also by the large device of material within easy reach. Steel (unacknowledged) played a prominent part in modern designs, accounting for much of the unsatisfactory appearance of our street architecture. Many of the buildings on the Embankment were shown, as this was the most successful river frontage in Europe; it would be difficult to find elsewhere so many fine and important buildings in one street ranging from the Houses of Parliament to the Electric Light Station, and it offered excellent examples of buildings devoted to the most varied purposes. The lecturer also spoke on the question of whether to treat a building as part of a scheme or as an isolated building, but favoured the latter. There were also shown slides of various business premises in the City, as illustrative of the fact that it was to the commercial element of our social condition that we must look for the growing prospects of London architecture. A discussion afterwards followed, and a vote of thanks to the lecturer was proposed by Mr. R. P. Oglesby, and seconded by Mr. W. H. Thorpe.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The ordinary monthly meeting of this Society was held on the 9th inst. in the Lecture Hall of the Literary and Philosophical Society, Mr. T. Winder presiding. A ballot was taken, and the following gentlemen were elected as associates: Messrs. W. A. Forsdike and J. E. Whitehead. Mr. T. Swaffield Brown then read a paper on "The Proper Relation of Design and Handicraft." The lecturer referred at the outset to the lectures and discussions of the Society on what are called practical subjects connected with art, and said that he wanted to call attention to ethical as well as practical considerations, these being generally neglected to the great detriment of art. He said that he desired to do so not because he thought he could do it well, but because he thought it needed to be done, and that it was one of the few things which had better be done ill, and often, than not done at all. It was necessary, because in these matter of fact times such subjects are jostled out of the way, although they might illuminate much which puzzles the so-called practical man, who prefers to attribute to chance or accident much which is really due to spiritual insight—as in discussions on the origin of the pointed arch and such matters. But there were signs that the efforts of great thinkers had stirred the still waters of apathy and brought to the surface one or two questions whose apparent complexity had diverted attention from their origin and hindered their solution. One of these was that of the proper relations of design and handicraft, about which much had been said and written by those whose trade it was to talk and write, but little by designers and craftsmen, whose business it was to know and to do. A designer and craftsman himself, he addressed the designers and craftsmen present as a fellow student, not as a teacher, who desired to see the elevation of art practice to a higher plane than that of its present operation generally. Generally, because there are those whose practice is at a high level, and their conspicuousness mark the exceptions which prove the rule. The architect was the arch-type of designers, because the

architecture of nations is the petrified symbol of the sum of their art, and of much else of importance in their history. And even now most design and work was in some way dependent upon architecture. Therefore it seemed a fitting opportunity to speak upon the relationship of design and handicraft. He thought these were not in a healthy condition, because of the common use of the two terms as things apart, not merely qualities of the same thing as inseparable for use as soul and body. And they were not only spoken of but treated as things to be practised by separate individuals, separate classes, and in separate places. He attributed this partly to the modern propensity for analysis rather than synthesis, which concentrates attention upon parts and loses sight of the whole. And so the significance of the word Art is lost, and it is applied to what is not Art, just as "charity," religion, and so on, were applied to quite different things. But, fortunately, as a matter of practice the complete division of the spiritual and material was impossible, because no conception could become visible except through handicraft of some degree. The use of pen or pencil to record it was handicraft; but the greatest skill in the use of the chosen instrument would not produce a work of art in the absence of conception. Want of appreciation of this simple fact had caused great errors, and efforts to grasp it had led to absurd results for lack of comprehension. The former led to the destructive division of the two functions, the latter to the crippling of them by unfitting union. He then, while disclaiming any concern with any but "applied" art in this lecture, called attention to the immense utility of "gallery" art as furnishing specimens illustrative of the effective co-operation of motive, conception, and execution, unhampered by commercial or other deterrent influence, and forming precious ideals for our guidance. But it must be recognised that in applied art, although the same principles govern, their application is subject to the limitations of material, etc., and it is necessary to economise power by confining the best effort, which is the rarest, to the tasks which need it most. And this was "specialisation," which he thought was, by unwise use, the cause of much of the mischief, because it led to the arbitrary choice of unfit material for the making of the craftsman to fit the sub-division of specialism, instead of encouraging his development to his fittest place. And so the designer and craftsman lose touch of each other, and their work suffers in consequence, as well as the men. He then referred to the older methods under which the craftsman practised his craft with full scope for his power, and whose position depended upon that, and advocated the adoption of similar methods, but pointed out that the change must be gradual for fear of greater confusion. For although he attributed the mischief to over-specialisation, this in itself was but one of the results of "civilisation," and had grown with it. This civilisation had been defined as the "art of living in cities." He would prefer to call it becoming "inured" to them and insensible to the influence of beauty, and he then endeavoured to show how their incidents affected art—which was the very and only remedy for them—so that things seemed at a deadlock. But it was not so, because such societies as that showed that some men were not content to remain in apathetic indifference. The effort of the last fifty years to popularise art practice had failed because it attempted to teach the unteachable. Art could not be taught. He gave some of the results of last year's examinations in support of the statement of failure. He suggested that the remedy was a system of co-ordinate education, which, beginning in the school, should lead the child through its different stages by selection at each step, eliminating early those whose dispositions were towards mechanical or commercial pursuits, and taking the others by wise advice and guidance along the paths which their experience and tastes led them to choose, not putting them through the usual rigid course which so often leads to disgust and abandonment. He thought that this would restore the unity of art practice, and elevate the worker, creating a force which would ultimately crush the sordid influences which made our surroundings what they were.—On the motion of Mr. J. B. Mitchell-Withers, seconded by Mr. E. C. Skell, and supported by Messrs. Charles Green, J. R. Wigfull, W. C. Fenton, and Walter Rawson, a hearty vote of thanks was accorded to the lecturer.

If there was this right of appeal the County Council would appoint a committee of those not interested in the district, and with their sanction they would look at the plan and consider the question in dispute, and they would have little friction. Once the local authority found they could not act improperly without being overruled they would rarely do it again. He had had that experience. For years he had fought for the District Council taking over a parish road, and at last appealed to the County Council, and the local authority was hopelessly beaten. Now everybody said this was the best thing which ever happened. Some time after he had another road, and when he threatened the District Council with an appeal again the matter was settled at once. It was quite evident that people did not know what really happened with reference to his unfortunate dispute. It was evident that Mr. Casson knew nothing of the facts, although he appeared against him. Mr. Casson said it was a great pity that he defied the council and would not obey the by-laws, but that was not the point at all. The whole point was that it was the Rural Council who were breaking the by-laws, and he refused to be bound by them when they tried to enforce by-laws on him which did not exist. By the new model by-laws they were only entitled to have the plan of the ground floor. That was what he gave them, and they said, "We are to have a complete plan of every floor." He told them they were not entitled to them and would not have them. The magistrates in their historical findings found for him on all this. The only thing on which they found he had not done right was as to the earth closets and the ash pits. There were six by-laws in respect of the earth closets, one of which was as to the height of the seats, and there were six by-laws with regard to ash pits. He was told he had not depicted that on a small diagram, although he had on his plan sketched the outside of the closets. The Council would never tell him where he was wrong; they would not look at the plans and never had. He thanked them for the interest they had taken in the question, and they could depend upon it that the proper housing of the rural population was the basis of the difficulty of the scarcity of labour in the country and of the crowding of the population into the large towns.

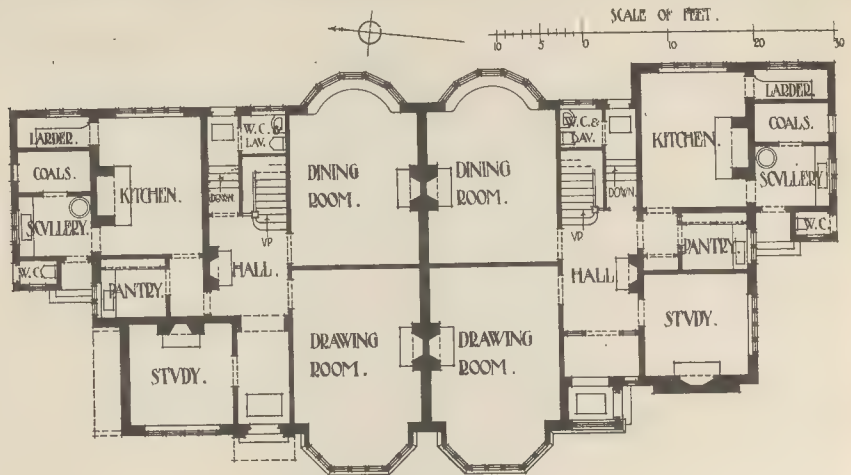
Mr. Stanning thanked the meeting for the reception they had accorded his paper, and said it was so late that he thought it would be best if he replied to the criticism in the *Professional Notes*. The object of his getting out the suggested by-laws was really to put some ideas before them on one or two subjects. It was agreed, he thought, that a new code was necessary, and that was the principal thing he had suggested. Various details had been criticised which he would like to refer to in a full manner. The three leading points were the necessity of new by-laws, the tribunal of appeal, and better definitions. He thought they could select men in that room who, joined with the Institute of Architects and with the Local Government Board officials, might draw up by-laws which could be made workable and which would meet nearly every case. They might have all particulars put into the code, but a certain elasticity could be given, and with a court of appeal it would meet every case, and they would get rid of friction. The Local Government Board were the people to do it, and what they—the surveyors and others—had to do was to press that Department to take the matter up.

The Chairman said that Mr. Menzies would also reply to criticisms on his paper in the *Professional Notes*. With reference to the discussion, there was no doubt that the first thing necessary was to have some kind of legislation. Without legislation it would be absolutely impossible to get the existing by-laws recalled by the Local Government Board, because they had no power to do so.

The discussion then closed.

The Chairman announced that the next meeting would be held that day fortnight—February 27—when a paper would be read by Mr. Harold Griffin on "Some Proposals for Improving the Law and Practice of Rating Property."

APPOINTMENTS.—**OXFORD UNIVERSITY.**—Mr. C. J. Holmes, of Brasenose College, Slade Professor of Fine Art, has been elected a member of the Board of Architectural Education. The Provost of Oriel College has been nominated to represent the University at the International Congress of Archaeologists to be held in Athens in the course of next April.



Houses, Parkside Gardens, Wimbledon. Plan.

BRISTOL SOCIETY OF ARCHITECTS.—On the 13th inst. a lecture on "The Homes of the Courtiers of Queen Elizabeth" was delivered at the Fine Arts Academy by Mr. J. Alfred Gotch, F.S.A. The lecture was arranged by the Bristol Society of Architects, and Mr. G. H. Oatley, President, was in the chair. Mr. Gotch reminded his hearers of the universal desire in the Elizabethan reign for better homes. While this desire was being augmented both from within and without—from within by the change of ideas on the subject of household arrangements, and from without by the sight of what was being done in foreign lands—there came that notable event, the dissolution of the monasteries, which entailed the transference into secular hands of most of the immense revenues formerly held by the Church. The desire for better homes and the means of gratifying it being thus present together, it only wanted the tranquillity afforded by Elizabeth's strong rule to set people building all over the land. For fully sixty years this great building period lasted, and there was hardly a village in England which could not show some work dating between the years 1560 and 1620—a period which practically covered the reigns of Elizabeth and James. The work of this period, moreover, had a flavour peculiar to itself and different from that of any other time or country. The work of the time of Elizabeth and James, whatever its shortcomings and however foreign its adjuncts, was English in its essence and always interesting. Having spoken of the pedantic quaintness which was often characteristic of Elizabeth's and James's time, the lecturer referred to the curious inscriptions, of which he said an infinite number might be collected. The lecture was illustrated by limelight views.

NORTHERN ARCHITECTURAL ASSOCIATION.—A meeting of the Northern Architectural Association was held on the 14th inst., at the Y.M.C.A. building, Newcastle, under the presidency of Mr. J. W. Taylor. Mr. Ralph Hedley delivered a lecture on "Architectural Details in Charcoal." He said the very best training for students was to practice the drawing of the human figure from life. It was the best training for proportion. In designing he did not mean that they should slavishly copy from nature or from old examples, but only that they should take them as their motive after thoroughly studying them; then arrange the pattern to their individual taste, always taking into consideration the position the design is to be seen from. If he might be so bold as to say so, he thought architects ought to work more on easels and not so much on nearly flat desks.—A vote of thanks was given to Mr. Hedley for his lecture and demonstration. The Secretary (Mr. A. B. Plummer) announced that the Royal Institute of British Architects had suggested that the annual dinner, which was deferred from last year, should be held in Newcastle this year, and it is expected that steps

will be taken formally to invite the Institute to do so.

ARCHITECTURAL ASSOCIATION CAMERA AND CYCLING CLUB.—At the meeting on the 14th inst., Mr. R. Wellbye read a paper on "Old Coaching Inns," showing how intimately they were connected with the social history of all classes of people. The earliest known prototypes of the coaching inns were the monasteries, where hospitality was dispensed free to the poor and at varying charges to rich visitors. There is no known analogy between these monastic establishments and the mediæval inns, but Mr. Wellbye suggested that the latter arose to cope with the visitors frequenting the better known shrines, and instanced the "Four Swans" Inn at Waltham, which stood on the main road, while the Abbey was somewhat out of the way. The "New Inn," at Gloucester, was possibly the earliest example of these inns, and was probably built to accommodate guests for whom there was no room in the monastic buildings, since it still belongs to the Dean and Chapter of the cathedral; it was built shortly after the shrine of King Edward became well known to pilgrims. In the Middle Ages private hospitality was so general that inns were not the necessity they afterwards became, and a few date earlier than the latter half of the XVth century, although ale-houses date back to Saxon times, as the "Fighting Cocks" at St. Albans. The word "inn" is derived from a Saxon word meaning a chamber, for in early times all the guests slept in one room and often in one bed. Mr. Wellbye mentioned one large circular bed which accommodated forty persons. In speaking of the legends concerning dishonest innkeepers, Mr. Wellbye referred to "The Ostrich" at Colnebrook, and mentioned that the name was a corruption of "hospice," continuing with an account of the many names and their derivations. A number of slides were then shown of decayed and disused inns, showing how the buildings have been converted to other uses from time to time as trade fell off with the advent of railways. The paper concluded with a description of the various types of signs and their support, many of the latter being exceedingly elaborate and well designed.

Fifty Years Ago.

TOWN SEWAGE.—At a recent meeting of the Central Farmers' Club, Mr. Mechi read a paper on the extent to which town sewage can be profitably applied to the purposes of agriculture. Considerable discussion was elicited, in which Mr. Edwin Chadwick and other gentlemen bore a part. In the end a resolution was agreed to:—"That the application of sewage manure might be rendered of great advantage to agriculture if it could be supplied at a cost sufficiently moderate to warrant its use." The adoption of this resolution, reports the

Morning Herald, was followed by much laughter.—*The Builder*, February 17, 1855.

MOTIVE POWER BY ELECTRICITY.—Mr. G. R. Dering, of Lockley, Herts., has taken out a patent for obtaining motive power from electricity. The arrangement consists of a flat surface composed of a series of electro magnets, on which is made to rook or roll, by their galvanic action, a cylinder which either itself constitutes a keeper or armature for all the magnets, or carries, or has suspended to it, a number of armatures corresponding with the electro-magnets. The object of this arrangement is that by a succession of small pulls on long strokes may be obtained, and thus the full power of every magnet secured without the loss hitherto sustained in most arrangements for producing electro-motive power.—*The Builder*, February 17, 1855.

Illustrations.

A LOUNGE AND STAIRCASE FOR A HOTEL.

HIS is the design which obtained for its author, Mr. Robert Atkinson, of Nottingham, the Tite prize of this year at the Institute of Architects.

In explanation of his intention in the design, Mr. Atkinson writes:—

"The main idea in the design was to give a structure the shell of which was capable of being erected in rough brickwork and concrete, and the decoration applied afterwards. Keeping this in view, I decided to make the decoration of thin marble slabs as much as possible, the marble columns being the only parts of the finished design to be put in during erection."

I also thought it desirable for the main staircase to go up to nearly the top of the hotel and the lounge itself to run up through two stories; this I did by making galleries level with the springing of the large arches and connecting them by small arches through the thickness of these larger arches.

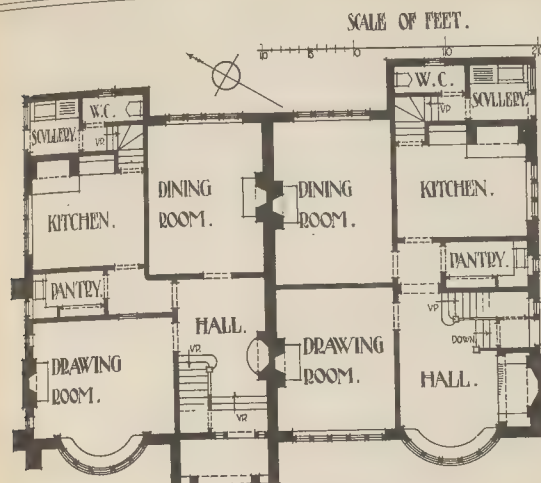
The chief difficulty was in working in the height of 35 ft. given by the conditions, this height only being sufficient for a very flat saucer dome.

The lighting is principally by the lantern and a large semicircular window on one side."

HOUSES, WIMBLEDON.

THE two plates show two sets of semi-detached houses at Wimbledon, by the same architects, Messrs. Hubbard & Moore.

The houses were built for the Wimbledon House Estate Co. on their estate at Wimbledon, and an endeavour was made to conceal the party wall parapets as much as possible. The materials used in the Parkside Gardens building were red Crowborough brook facings, rough cast, and Broseley tiled roofs. The



Houses, Burghley Road, Wimbledon. Plan.

contractors were Messrs. J. C. Richards & Co., of Paddington.

The Burghley-road houses are all in rough-cast, with green slates. The contractor was Mr. F. G. Minter, of Putney.

SCHOOL BATH CENTRE, AMSTERDAM.

These drawings illustrate a municipal establishment at Amsterdam for giving children from the primary schools a cleansing bath in a very short space of time, by a collection of domestic baths arranged round an octagonal apartment and controlled by an attendant in the centre of the room.

The plans are traced from drawings lent to us by Miss Alice Ravenhill, who referred to the subject at the School Hygiene Congress last week, and who has furnished us with the following description of the establishment and its working:

"At a time when public attention is being directed to the factors which make for health, the following description of a most successful school-bath centre at Amsterdam cannot fail to be of interest to those interested in the co-ordination of measures for the promotion of national well-being with the existing machinery for elementary education, especially in view of the fact that German school hygienists admit its superiority to anything of the kind at present to be found in that country.

The maintenance of a high standard of well-being demands strict and regular attention to personal cleanliness, as well as the provision of suitable food and the occupation of wholesome houses. To the neglect of thorough and systematic washing of the whole body are attributed many of the skin and other physical troubles which hamper satisfactory development among the Dutch population; for it is a curious fact that in a country where water is always at hand in abundance, and where domestic cleanliness has been developed into a fine art, neglect of ordinary personal cleanliness prevails to a serious extent among the industrial population. It is also a well-known fact that self-respect invariably suffers where dirt in any form is habitually tolerated, so that the results are injurious to morals as well as to health; for both reasons, therefore, vigorous efforts are now active in Holland to combat this prevalent disregard of one of the first principles of hygiene.

It is some years since the first efforts were made to develop habits of personal cleanliness in the scholars of the poorest quarters of Amsterdam by the practical method of weekly baths. Various attempts to adapt disused class-rooms or gymnasia proved unsuccessful, until in 1900 the problem was satisfactorily solved by the erection of a school-bath centre, where seven classes a day, or about 2,000 children a week, go through a most complete cleansing process. To meet the need for such institutions among a much larger proportion of the school population, it has been recently decided to erect a second centre, planned on very

similar lines; though it is hoped that certain disadvantages which exist in the first building will be avoided. Of the detail plans which I have permission to publish, those of the bath cubicles are designed for the new building; while the ground plans and elevation are those of the existing centre. Through the great courtesy and kindness of Dr. Gunning, Chief Inspector of Schools, and of Mr. Van Hessel, Director of Public Works, I am also able to supply useful details as to cost and working expenses, for the information of English readers.

The elevation, with its timber and plaster walls, is homely, artistic, and appropriate. Within, the fittings are simple and strong. I recently had the pleasure of inspecting every portion of the building, except the rooms occupied by the caretaker and his wife, who act also as bath man and woman. A small room on each side of the entrance is reserved for committee and official purposes; each class, on arrival with the teacher in charge, marches past these into the waiting-room, where, if necessary, a pause can be made while the class which preceded it passes out. Five minutes is allowed for undressing, under the teacher's supervision, in the dressing-room, which is well warmed, and supplied with pegs and benches; the children then pass into the douche-room before removing their undergarments, which are taken off on entering the bath cubicle and placed on small benches in front of the occupants. A five minutes douche follows at 104 F., the water being regulated from the centre by the bath attendant, both as regards temperature and volume. Each child is then required to soap thoroughly all over, a tin receptacle for soft soap being attached to each cubicle, for this five minutes is also allowed. A second douche follows, the temperature of the water being gradually cooled down to 90 F. At a given signal each child then steps out on to a cork mat in front of his cubicle, and five minutes is allowed for a brisk rub with a dry, rough towel; the undergarment is then resumed, and five more minutes is usually found enough to complete the toilet in the dressing-room.

Experience proves that an hour's absence from school and half-an-hour at the bath centre, is sufficient to satisfactorily accomplish the whole process, with manifest advantages to the physique and habits of the children who have attended the centre for some time. Where a morning is set apart for boys to bathe, girls attend in the afternoon, and so on alternately.

As classes in Dutch elementary schools are not allowed to contain over forty pupils, both bath centres are designed to accommodate this number at one time; the circular douche-room has, therefore, forty cubicles, each of which measures 27 in. at the entrance, and widens out to 32½ in. at the back, the length being 41½ in. The partitions in the existing centre are made of corrugated iron, but this is to be replaced in the new bath-house by opaline glass plates, ½ in. thick and 43 in. high;

a space of 9 in. being left open between their base and the floor. At the back the partitions are fixed to the wall, in front an iron framework affords support (see Detail C), these frameworks are coupled at the top by a flat iron rod. A handle is to be attached to the opaline partitions on each side (C), by means of which the children can support themselves, when washing their feet. The wall at the back of each cubicle is tiled to a height of 63 in., above which it is painted with 'ripolin.' The floor is concrete, paved with tiles laid at a slight inclination from the centre to the cubicle; a circular gutter, also concrete, runs round the walls, and traps are placed at intervals through which the water is carried off by iron pipes to the city conduit.

Wooden gratings have so far been used on the cubicle floors (B), but are to be replaced by corkelabs (as shown at F) in the new building, as the wooden gratings prove unsatisfactory. Not only do they become shabby and worn, but occasionally small accidents occur to the feet from splinters.

In each establishment the pipes are so arranged that 10, 20, 30, or 40 shower baths can be taken at one time.

The cost of building and fitting the existing centre was 1,578*l.*, exclusive of the site.

The annual expenses amounted to 57*l.* in 1901, to 255*l.* in 1902, and to 266*l.* in 1903.

The centre was opened in September, 1901, and the number of baths taken to December 31 was 28,924; in 1902 the total reached was 88,582, and remained about the same in 1903.

The cost of each bath taken in 1902 and 1903 works out at 7d., but in this estimate no allowance is made for the value of the site, nor of the fact that the money for building was borrowed on a 4 per cent. loan with a yearly amortisation of 2 per cent."

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Mr. J. Williams Benn, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend Fulham Borough Council 15,000*l.* for street improvements and 30,000*l.* for provision of burial ground; and Hammersmith Borough Council 3,000*l.* for site of baths and wash-houses.

The Strand Scheme.—The Improvements Committee presented a report with regard to letting the crescent site of the Holborn to the Strand improvement for a French exhibition and theatre. The Committee recommended:—

"That Mr. W. Gilbee Scott, F.R.I.B.A., and Mr. Ernest Gérard, acting on behalf of a French syndicate, be granted an option, to be exercised within six months, for taking up a lease for ninety-nine years, at a rent of 55,000*l.* per annum, of the central portion (having an area of about 123,350 sq. ft.) of the crescent site formed in connexion with the Holborn to Strand improvement; that the letting be subject to the result of the usual inquiries proving satisfactory, and subject to an agreement to be prepared by the Council's solicitor; that the Improvements Committee be authorised to complete the matter on the basis (1) that one year's peppercorn be allowed and that the rent for the second and third years be at the rate of 27,500*l.* per annum; (2) that one year's ground rent (55,000*l.*) be paid to the council upon the signing of the building agreement; (3) that no public drinking bars be allowed other than those proposed to be used in the theatre during the performances, and that these be subject to the usual requirements of the Lord Chamberlain; (4) that the buildings be erected and the grounds laid out in accordance with plans to be approved by the Council; (5) that no departure from these plans be allowed without the previous sanction of the Council; (6) that no part of the site or of the buildings thereon be sublet without the sanction of the Council; and that the seal of the Council be affixed to any necessary documents."

In reply to Sir M. Beachcroft and others, Mr. Davies, Chairman of the Committee, said there was no sum specified as to the amount to be expended on buildings on the site. The applicants had agreed to deposit 55,000*l.* one year's rent, in taking over the building agreement.

Mr. Radford moved that the recommendation be referred back to the Committee. A point of cardinal importance was that the Committee did not know whether the buildings to be erected on this site would be sufficient to secure a ground-rent of 55,000*l.*

Mr. Spokes seconded the amendment, and characterised the proposal as both objectionable and unbusinesslike. Such an option as this should not be granted without the most substantial deposit, to be forfeited in case the option was not exercised. The money would probably be raised in France, and it might be by the objectionable process of lottery bonds.

Mr. Burns, M.P., said he should vote against the scheme. He believed that if they would only wait a little until such time as the money market improved, they would be able to get for this splendid site of 2½ acres a value commensurate with what was offered by this syndicate, and have property put upon the land more in keeping with the amenities of the spot than this scheme for "Paris in London," which had so fascinated his colleagues. He protested against the best street in London being solely relegated to music-halls and casinos.

Captain Hemphill supported the recommendation, on the ground that it was a wise course for the Council to let its land for amusements which it would so well have under its control.

Sir W. Richmond said he intended to vote with the Committee, but he thought the term "Paris in London" rather objectionable. They should not reject a scheme of this kind simply through insular prejudice. If the land was not let to the syndicate they would get upon it monstrous great houses which would overshadow the whole neighbourhood. The designs for the proposed new buildings were in the hands of a British architect, and the Council would be able to see that the terms of the lease were faithfully carried out.

Sir M. Becheroff said that as business men they ought to wait until they got offers to cover this land with buildings at rack-rents which ought not to be less than three times the amount of the ground-rent. As a matter of business the scheme stood condemned, and he would rather that the Chairman took it back than face an adverse vote. He moved that the debate be adjourned, in the hope that the scheme might be withdrawn.

The motion was lost.

Mr. Granville-Smith supported the scheme on the ground that it would add to the architectural beauty of this part of London.

The Council divided on the amendment, and the matter was referred back.

Rotherhithe Tunnel and Rehousing.—The Bridges Committee recommended:—

"That application be made to the Secretary of State for the Home Department for the modification of the scheme for providing accommodation for persons of the labouring class displaced on the south side of the River Thames in connexion with the construction of Rotherhithe tunnel, so that the Council may be allowed to defer for the present the erection of dwellings on the Albion-street and Clarence-street sites."

The following amendment, by Mr. Pomeroy, seconded by Mr. Granville, was accepted by the Chairman of the Committee:—"That the words 'the present' be omitted, and that the words 'two years' be substituted therefor."

The recommendation, as amended, was agreed to.

Greenwich Tunnel.—The same Committee recommended, and it was agreed:—

"That the supplemental estimate of 23,350, submitted by the Finance Committee be approved; and that expenditure of sums not exceeding that amount in all be sanctioned for the acquisition of property and the payment of compensation claims in connexion with the construction of Greenwich tunnel."

Hoborn to Strand.—Elevation of new "Morning Post" Premises.—The Improvements Committee reported as follows:—

"It is provided by section 40 (13) of the Council's Improvements Act of 1899, that the elevation and exterior design of the buildings to be erected by Lord Glesnek for the re-instatement of the Morning Post premises shall be subject to the reasonable approval of the Council. Plans of the suggested elevation have been submitted to us for the Council's approval under this section. The elevations will be somewhat French in style, and will be erected in grey granite (unpolished) or Portland or other approved stone. The actual material to be used has not yet been determined by Lord Glesnek. The building will have frontages to the Strand, Aldwych, Eber-street, and Wellington-street. The plans show the portion of the building fronting the Strand will be surmounted by a dome; we do not agree, however, that the main architectural feature of this building, namely, a dome, should correspond in character, but not in scale, with that on the Gaiety Theatre, having regard to the proximity of the two buildings. We have represented this view to the architects acting for Lord Glesnek, but they do not see their way to amend their plans. In view of the terms of the section mentioned above, however, we do not feel justified in advising the Council to make the alteration of the dome a condition of the approval of the plans."

The Committee recommended accordingly, and it was agreed.

Mr. Davies, in reply to some discussion, said that the matter was an important one. The design of the building was an excellent one, but the corner dome was small. Sir Wm. Richmond had interested himself in the matter, and the Committee hoped that his intervention would have a satisfactory result.

Indication of Houses of Historical Interest.—The Local Government Records and Museums Committee reported that they consider that

the residence of Sydney Smith, at No. 14, Doughty-street, W.C., should be commemorated and their recommendation, "That a tablet be affixed to No. 14, Doughty-street, W.C., to commemorate the residence of Sydney Smith thereat," was agreed to.

London Squares and Enclosures (Preservation) Bill, 1905.—The Parliamentary Committee recommended, and it was agreed, that the London Squares and Enclosures (Preservation) Bill, 1905, be amended so as to permit of the rebuilding of the existing dwelling-houses to an altered line of frontage, and the provision of new outbuildings to the school situate in Wellclose-square, Whitechapel.

Duke of York's Theatre.—It was agreed to inform Mr. W. Emden that the Council has no objection, so far as its regulations under section 12 of 41 and 42 Vict., cap. 32, are concerned, to the arrangements shown on the plan submitted by him with regard to Nos. 24, 31, 36, 39, and 47 of the Council's suggestions for the improvement of the Duke of York's Theatre, provided certain conditions were complied with.

The Building Act and the City Mills Building. 1, Upper Thames-street.—The Building Act Committee reported on the result of the coroner's inquest on the fire which occurred at the City Mills Building, 1, Upper Thames-street, on January 17, and the jury's rider, i.e.:—"We are of opinion that the building is not of suitable construction for the business carried on therein, and that ample and adequate means of exit should be immediately provided for the safety of the persons employed there, we being of opinion that it is a most dangerous place in case of fire"; and they recapitulated the action taken by the Council with regard to these premises. In the course of the report the Committee referred to the case heard before Mr. Justice Buckley arising out of an award on an arbitration in which the owner of the buildings was required to do certain work. The judgment was to the effect that the umpire was not justified in requiring the Council to serve, and consequently the Council was not justified in serving, a notice requiring the owner to do any works for providing a means of escape for the persons employed in the portion of the building occupied by Messrs. Farwig & Co. as a factory, through the portion of the building occupied by Messrs. Spiers & Pond as a factory, and, conversely, that the notice could not require the owner to do works in Messrs. Farwig's portion of the building for the benefit of the persons employed in Messrs. Spiers & Pond's factory. Proceeding, the Committee reported as follows:—

"We pointed out that the effect of the judgment appeared to be to make it practically impossible for the Council to deal with any 'old' factory premises, other than those which were wholly in one occupation, which were 'tenement' factories within the definition contained in the Act, as construed by Mr. Justice Buckley, i.e., premises the whole of which was occupied as factories, the mechanical power for which was derived from one common source; and that it would be easy for the owner of a factory building, by letting such building to more than one occupier, to evade the provisions of section 14 of the Factory and Workshop Act, 1901. The judgment increased the difficulty, caused by questions of trespass, which the Council had always experienced in the discharge of its duty under the Factory and Workshop Acts with respect to the provision of means of escape in case of fire. As showing the serious nature of this difficulty it was stated that of 106 cases within the City remaining to be dealt with, 26 could not be effectively dealt with owing to questions of trespass, and of these 26 cases 22 were classified as dangerous. As the Council could not take any further action in the matter, the whole of the facts were communicated to the Home Secretary with an intimation that the Council would in future remit to him all cases with which it was unable to deal effectively under the present law."

The building consists of basement and ground and seven floors over; the floors are in various occupations. The building is about 220 ft. in depth from north to south, and there is only one escape from each floor, and this is situated at the north end of the building. The escape from the seventh and sixth floors is by a wood staircase of step-ladder construction in the north-west angle of the building, open on the seventh floor, and enclosed with wood partitions on the sixth floor, and with brickwork from the sixth floor downwards to the street. The escape from the fifth floor is from the floors below the fifth floor at the north-east end of the premises affords escape from the fifth and floors below into the street. The number of persons employed is 354, and the number above the ground floor is 277. From a consideration of the description of the building it was evident that the danger from fire to persons employed in the building is very great. The two top floors are occupied by persons employed in making packing-cases, and there are numerous stores for heating solder and tins. On the other floors there are great quantities of inflammable materials, especially on the first, ground, and basement floors where straw is stored for use in connexion with packing and distributing goods from Messrs. Spiers & Pond's grocery stores. There is only one means of escape from each floor, and that of unsatisfactory construction, and in the event of a fire occurring on any floor people working at the end of the building, remote from the

staircase, would have to traverse 220 ft. through fumes and smoke, across a floor covered with obstructions. Then, if the escape for a person on the upper floors if the staircase became involved, and even if access to the roof could be obtained there would be no chance of escape except by jumping from a height of about 50 ft. into the street. It will thus be seen that the whole of the fire occurring in such a building when the whole people were on the premises would almost certainly be attended with serious loss of life.

When the Factory and Workshop Act, 1901, was under consideration in Parliament, amendments to meet cases such as the City Mills buildings were suggested by the Council, but the Government did not see its way to adopt them. Some of these amendments have been included in the Factory and Workshop Act, 1901, Amendment Bill, which was introduced into Parliament in the session of February, 1904, by Mr. H. J. Tennant, M.P. It was shown the need for further powers to secure the provision of reasonable means of escape in case of fire from buildings in which numbers of persons are employed we would invite attention to the following particulars with regard to the work under the Factory and Workshop Acts which were given in the annual report of the proceedings of the Council for the year ended 31st March, 1904.

Approximate number of persons employed in—	
Factories, etc., in which means of escape have been provided to the satisfaction of the Council—	60,000
Old factories	37,500
New	97,500
Factories, etc., being dealt with by the Council	71,000
Factories, etc., remaining to be dealt with	70,000
Factories, etc., dealt with by the Council, but with which the Council cannot deal	16,000
	254,500

The total number of persons employed in all factories and workshops in London was given as 499,833, in the report of the Chief Inspector of Factories and Workshops for the year 1898, the last annual report in which this information is given.

The number of persons employed in indoor occupancies, which for the most part involve work in factories, workshops, warehouses, and other business premises, may be estimated from the figures given in the report of the annual returns of the Council on the census returns as considerably more than a million. It therefore follows that a very large number of persons are working and possibly living in buildings, the owners of which cannot be required to provide reasonable facilities for escape in the event of fire, as the Council, which is the authority for enforcing the provisions of the existing law with regard to the means of escape in case of fire, has no power to deal with many buildings in which the danger from fire is very great owing to the want of legislation on this subject. There can be no doubt that the City Mills is but one of numerous buildings in the City and elsewhere in the County of London of which renders them in the event of fire extremely dangerous both to life and property.

The London Building Acts Amendment Bill, 1905, contains clauses which have been framed with the object of removing as far as practicable the danger to life and property in the County of London, arising from the inadequate provisions of the existing law for securing means of escape in case of fire, and for preventing the spread of fire. In our opinion the question of dealing with the construction of buildings so as to prevent the spread of fire is so intimately connected with that of the provision of means of escape, that the two questions should be dealt with together, and at the earliest opportunity.

We may remind the Council that the London Building Acts Amendment Bill, which was introduced into Parliament in 1903 and subsequently withdrawn, was the outcome of an action of the Council, in which the Council, in 1903, resolved to the Council stating that, in view of the facts disclosed at the inquest on the Queen Victoria-street fire, he thought that the question of further legislation on the subject of safety from fire in buildings required early consideration; that in his opinion the matter could not be adequately dealt with by a mere extension of the powers of the Council under the Factory and Workshop Act, 1901, and he was therefore disposed to think that any new legislation should take the form of an amendment of the London Building Act, 1894; that as this Act was a local Act any amendment of its provisions would naturally be by a private Bill promoted by the Council, and that he would be glad to assist in any proposal that might be made for that purpose next session so far as it might be possible for him to do so. The Home Secretary subsequently informed the Council that he would have no objection to the extension to existing buildings of the provisions with respect to means of escape from fire, under proper conditions and in suitable cases, provided adequate provision were made for allowing the owners or occupiers of existing buildings an appeal to an arbitrator of his own choice.

In the inquiry which was held by the City Coroner as to the fatal fire which occurred in Queen Victoria-street on 8th June, 1902, Mr. E. Woodthorpe, who was the coroner, in his evidence which was given in the coroner's court, gave evidence which may be accepted as a fair statement of the facts. He stated in the course of his evidence that the provisions of the Building Act with regard to the protection of life from fire were inadequate; that as far as he could see no statutory provision was contravened in the construction of the building in question; that there were hundreds of buildings in his district which were veritable death-traps, and some alterations in the Acts and stringent regulations ought to be made. There were hundreds of buildings in the City without proper means of escape from fire, and in many of these buildings large quantities of inflammable goods were stored, and in the Metropolitan there were thousands of such buildings in which frequently the means and means of egress were blocked up by the accumulation of goods. In his opinion, section 83 of the Act of 1894 as to the provision of means of escape in high buildings was excellent, but it applied only to a few cases. The County Council had done four or five things in the way of good in enforcing the provisions of the Factory and Workshop Act, 1901, with regard to means of escape in case of fire, fearlessly carried out, and had made a very unpopular by so doing. In the case of the Cripplegate

the alterations required by the Council had been finished just before the fire occurred, and if these alterations had not been carried out there would have been a great loss of life. He considered that there should be more stringent regulations for factories in which not more than forty persons were employed, and that dwelling-houses should also have a means of escape. It is a mischievous fact that there are numerous buildings in the City and elsewhere in which there are less than death-traps in case of fire. The London Building Act Amendment Bill contains clauses which would deal with the more pressing dangers of the City, and in view of the opposition being raised in some quarters and in view of the importance of the Bill, it is desirable to send to that measure the views of persons interested in the Bill. It is well to call the attention of the Council to the fact that the City of London (Escape from Fire) Bill, which is being promoted in the coming session of Parliament by the City Corporation, although intended to secure the provision of means of escape for the many business premises in the City, would be entirely useless from the point of view of securing protection in a building like the City Mills and adjacent buildings. We recommend—That a copy of the above report with respect to the City Mills be sent to the Secretary of State for the Home Department, the London members of Parliament, the Corporation, the Metropolitan Borough Councils, City Corporation, the Metropolitan Borough Councils, and other authorities who may be opposing the London Building Act (Amendment) Bill."

Mr. Stuart Sankey said that the Committee need not have referred to the City Bill in the way they had. As a matter of fact, the Council's Bill was opposed by all the various authorities and professional societies, and it was not at all likely to pass. The Council would not get out of its promotion for less than 10,000, and he objected to spending money on the printing of such observations as were contained in the Report of the Committee. The City Bill, on the other hand, was a short one of three or four clauses, having to do with protection from fire, and it contained none of those drastic proposals such as were to be found in the Council's Bill.

Mr. Spinks said that the authorities opposed to the Council's Bill represented vested interests. Mr. E. Smith said that the City Mills Building was from basement to roof a death-trap. There had been three fires there, and fortunately they had occurred in the early morning had people been working there at the time the results would have been serious.

After further discussion, the recommendation was agreed to.

Holborn to Strand and Southampton-row—Tramway Subway and Paving, etc., Works.—The Joint Report of the Highways and Improvements Committee recommended:—

(a) That the working drawings, specifications, bills of quantities, and estimate of the cost (44,400*l.*) of the proposed works, including the construction of the subway of the tramway subway for the section of the E. & W. line between Great Queen-street and the premises of the Metropolitan Electric Supply Company in Sardinia-street, be approved, and be referred to the Works Committee with a view to the work being undertaken without the intervention of a contractor.

(b) That additional expenditure, not exceeding 250*l.*, be authorized in respect of the employment of a resident engineer and of clerk of works in connexion with the paving and tramway subway, etc., works in the Holborn to Strand and Southampton-row improvements, now being or about to be undertaken under the direction of the Works Committee.

The recommendations were agreed to. The Council adjourned soon after seven o'clock.

HIMMELSTADT HEALTH PROTECTION SOCIETY.

The eighth annual report of the Society states that the hon. secretaries, Miss Emily Field and Mr. P. Foster, having expressed a desire to be relieved of their duties, tendered their resignation, which was accepted with great regret, and Mr. A. H. Heath has undertaken to act in their stead. The committee take this opportunity of expressing their feeling (in which we entirely concur) that the Society is very greatly indebted for its existence to the initiative of Miss Emily Field, and that the success it has attained is largely due to her. The committee had expressed to the London County Council its regret that any removal of a tree and any lopping of branches in excess of legal requirements from the trees of the public ground to the north-west of the Pryor, East Heath-road, should have been considered necessary, and had also inquired of the London County Council if there would be any objection to the superintendent of the Heath conferring with the Society previous to any proposed interference with any of the older trees. This was declined, but it was added that the L.C.C. Committee would be prepared to give immediate attention to any representation from the Society. The committee express great satisfaction that the appeal inaugurated by Mrs. Barnett for subscriptions to purchase the 80 acres of grass land adjoining Wildwood Farm, to the north-west of the Heath, has been successful, and that these fields will, as soon as practicable, be handed over to the London County Council for the benefit of the public in perpetuity.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE LONDON COUNTY COUNCIL AT THEIR MEETING ON TUESDAY DEALT WITH THE FOLLOWING APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894. THE NAMES OF APPLICANTS ARE GIVEN BETWEEN PARENTHESES:—

Lines of Frontage and Projections.

Hackney, North.—A workshop at No. 18, Church-road, Southgate-road, to abut upon Culford-road, De Beauvoir Town (Mr. R. J. Smellie for Mr. A. C. Marks).—Consent.

City of London.—A projecting balcony at the fourth story level of a new building on a site abutting upon the north side of Budget-row and east side of Sise-lane, City (Mr. J. S. Gibson for Messrs. Holloway Brothers, London, Ltd.).—Consent.

Holborn.—Oriel windows at the "Camden" public-house, No. 18, Fore-street, Holborn (Messrs. F. J. Eedle & Meyers for Mr. M. Hildyard).—Consent.

Islington, West.—Buildings upon a site abutting upon the north side of Wharfedale-road and east side of Crinan-street, Islington (Mr. W. G. Green for Mr. C. Pedlar).—Consent.

Norwood.—A library building on a site abutting upon the western side of Herne Hill-road and southern side of Ferndene-road, Norwood (Mr. H. J. Smith for the Council of the Metropolitan Borough of Lambeth).—Consent.

Wandsworth.—Houses with projecting porches and bay windows on the eastern and western sides of Derlington-road, Tooting (Mr. R. Robertson for the Housing of the Working Classes Committee of the Council).—Consent.

Poplar.—Additional story to the Wesleyan Seamen's Mission building, Jerusalem-street, East India Dock-road (Messrs. Gordon & Ganton for the trustees of the Seamen's Mission).—Refused.

Width of Way.

Southwark, West.—Buildings on a site abutting upon King's Head-yard and White Hart-yard, Southwark, with external walls at less than the prescribed distance from the respective centre of the roadways of such streets (Messrs. Barlow, Roberts, & Thompson).—Consent.

Formation of Streets.

Lewisham.—That an order be issued to Mr. J. Stanford, sanctioning the formation or laying out of a new street for carriage traffic to lead from George-lane to Hither Green-lane, Lewisham, and in connexion therewith the widening of Hither Green-lane and George-lane.—Consent.

Lewisham.—That the application of Mr. G. Trotman for an extension of the period within which the roadways of a new street for carriage traffic in continuation of Garthorne-road, Honor Oak-road, Lewisham, and of a new street for foot traffic only to connect Beadnell-road with such proposed new street for carriage traffic, were required to be clearly defined throughout by posts and rails or so otherwise as the Council might permit, be thrown open to the public as highways, be granted.—Agreed.

Wandsworth.—Formation or laying out of new streets for carriage traffic out of Tooting Bec-road and Upper Tooting-road, Upper Tooting, Wandsworth (Mr. A. Wellings).—Refused.

Cubical Extent.

Hammersmith.—The carrying of shafting and conveyors through one of the party walls at the Manbré Saccharine Works, Brandenburgh-road, Fulham (the Manbré Saccharine Company, Ltd.).—Consent.

Space at Rear.

Fulham.—A deviation from the plan approved for the erection of buildings on a site on the north side of Dawes-road, Fulham, to abut also upon Hannel-road, so far as relates to the erection of water-closets at the rear of the buildings (Messrs. Batty & Eckert for Mr. W. Fewster).—Consent.

Space at Rear and Alteration to Building.

Hampstead.—An additional story on the existing addition at the rear of "Bank House," England's-lane, Hampstead, abutting upon Stanley-gardens, without the existing walls being increased in thickness so as to be in accordance with the first schedule of the said Act (Messrs. W. Littlewood & Son and Mr. J. Lawrence, jun., for Mr. H. F. Simlett).—Consent.

Means of Escape from the Top of High Buildings.

Kensington, South.—Means of escape in case of fire proposed to be provided, in pursuance of section 75 of the Act, from the sixth (top) story of No. 39, Kensington-square, Kensington, the upper surface of the floor of which story is above 60 ft. from the street level, for

the persons dwelling or employed therein.—Consent.

Cabmen's Shelter on the Victoria-embankment, Strand.—A cabmen's shelter on the Victoria-embankment, near Savoy-street, Strand (Mr. C. Mol. McHardy for the Cabmen's Shelter Fund).—Consent.

The recommendations marked + are contrary to the views of the local authority.

COMPETITIONS.

WALLASEY TOWN HALL.—Messrs. Briggs & Wolstenholme and Arnold Thornely write to say that the name of Mr. Thornely should have been included in our last week's notice, as one of the joint authors of the first premiated design. The mistake was not ours. It is not decided to exhibit the designs publicly; they are still under the consideration of the committee.

PUBLIC BATHS AT TOOTING.—The Baths and Wash-houses Committee of Wandsworth Borough Council reported on Monday having decided to erect, at a total cost not exceeding 6,000*l.*, baths on the front part of the site of the Tooting Vestry Hall, facing the High-street. Provision is to be made for sixteen first-class and twenty-four second-class spray baths for men and eight second-class slipper baths for women. Six architects, to be selected by the Committee, will be invited to submit designs, and the Committee will select one of these for adoption by the Council.

BOOKS RECEIVED.

CATALOGUE OF ZODIACS AND PLANISPHERES, ANCIENT AND MODERN. By the Rev. A. B. Grimaldi. (Gall & Inglis.)

BUILDING MATERIALS—THEIR NATURE, PROPERTIES, AND MANUFACTURE. By G. A. T. Middleton, A.R.I.B.A. (B. T. Batsford. 10*s.*)

TOOLS FOR ENGINEERS AND WOODWORKERS. By Joseph Horner, A.M.I.Mech.E. (Crosby Lockwood & Son.)

LIVES OF THE ENGINEERS. By Samuel Smiles. Popular edition. Telford; Boulton and Watt: George and Robert Stephenson. (John Murray. 3*s.* 6*d.* per volume.)

GAS PRODUCERS FOR POWER PURPOSES. By W. A. Tooke. (Percival Marshall & Co. 1*s.*)

NEOLITHIC DEW-PONDS AND CATTLE-WAYS. By A. G. Hubbard, M.D., and G. Hubbard, F.S.A. (Longmans, Green, & Co. 3*s.* 6*d.*)

THE POETRY OF ARCHITECTURE. By John Ruskin. (Geo. Allen. 6*s.*)

THE INVENTOR'S ADVISOR. By Reginald Haddon. Sixth edition. (Harrison & Sons.)

Correspondence.

RURAL BY-LAWS.

SIR,—It is possible that some of your readers may have had some experience of the quite unnecessary obstacles which the by-laws enforced by many rural councils place in the way of building operations. If any such wish to assist in improving the present state of things a suggestion may perhaps be taken from the action of the South Stoneham District Council, which, as reported in the *Hampshire Independent* of February 4, 1905, unanimously agreed to the following proposition:—"The attention of this Council having been called to the following resolution passed by the Royal Institute of British Architects on January 9, 1905—'That in the opinion of this meeting it is desirable that the Local Government Board should obtain Parliamentary powers to enable them to reform the by-laws now in force in rural districts and in the smaller towns with a view to the enactment of such by-laws, and such by-laws only, as are really required in the public interest'—it is resolved that the Clerk of this Council be instructed to communicate with the Local Government Board informing them that the resolution of the Royal Institute of British Architects has the sympathy and support of this District Council."

If similar resolutions are passed by a few more councils it will strengthen the position of the Local Government Board when they endeavour to obtain the powers referred to, and it is probable that many readers of your influential paper are in positions in which they can bring the matter to the notice of the local authorities.

The paper read before the Royal Institute of British Architects on December 19 last by

Mr. Lacy W. Ridge will give full particulars and suggestions for amendments to rural by-laws, but the principal thing now appears to be to get the Local Government Board to take the matter up in a practical manner.

N. C. H. NISBETT.

CUDWORTH RAILWAY ACCIDENT.

SIR,—I notice your leaderette *re* above. It is astounding to learn that we narrowly escape, it may be, thousands of accidents in fog when travelling by rail simply because, though detonators are kept in every signal-box, the signalman cannot fire them, and that, in all these years, the railway companies have been satisfied with the original and crude method of laying a detonator on the rail for the passing engine to set off with its wheels. It would be perfectly simple to have a detonator on a bracket upon the outer wall of the signal-box, and to fire it by a lever inside. The signalman then would have no need to leave his box, but, if a train ran past his signal, would merely have to pull a lever, fire the detonator, and hold up the train. A detonator fixed on a seat and fired (pin-fire) by an ordinary gun-lock, the trigger of which was pulled by a rod leading to a lever inside the box, would do perfectly well. TRAVELLER.

A.A. DISCUSSION SECTION.

SIR,—Would you kindly give me space to correct a statement in your last number.

At the meeting of the Discussion Section of the Architectural Association, held on February 1, I did not say that I considered the Albert Memorial a *successful* modern example of step construction.

The bald statement also that I considered St. George's Hall steps unsuccessful gives quite an erroneous impression of what I actually said.

THEODORE FIFE.
* * * We had no reporter present; we are indebted for the report to the kindness of a member of the Discussion Section. The room is a difficult one to hear in; and perhaps speakers do not always realise that uncertainty in a report may in some cases be the fault of the speaker as much as the reporter.—Ed.

WESTMINSTER CITY COUNCIL.

THE fortnightly meeting of this Council was held on Thursday last week at the City Hall, Charing Cross-road.

The Dispersion of Fog.—The Committee reported having received from the City Engineer a report on his visit to Birmingham to inspect Sir Oliver Lodge's apparatus for the dispersion of fog.

Closing of Brewer-street.—On the recommendation of the Committee it was agreed to accept the offer of Messrs. Watney & Co. "to pay the Council the sum of 1,600*l.* to bear all attendant costs, and to round off the corner of Brewer-street" in connexion with the closing of that portion of the street which is used only for the firm's business, and which, when their work is over and the existing gates closed, forms a very undesirable *cul de sac*. The Council will support the application to the justices.

Reinstatement of Trenches.—It was agreed that a notice should be sent to the various undertakers having power to break up the streets of the City, pursuant to the various acts and orders relating to those operations, that the Council will reinstate or make good the pavements of any streets or other works vested in or being under the control or management of the Council, which the undertakers or any of them may be empowered to break up.

London Building Acts (Amendment) Bill.—The Law and Parliamentary Committee submitted a report on this Bill, in which they described briefly the provisions of the Bill, and added "The law relating to the erection of buildings in London is notoriously in a very complicated state, and is distributed over a number of statutes bearing the name of Building Acts. If this Bill is passed the word 'chaotic' will very adequately describe the state of affairs which must undoubtedly ensue. Moreover, the relations between the borough councils and the London County Council are anything but satisfactory, and their respective jurisdictions require amendment and definition. Under the circumstances it appears that the time has now arrived for an inquiry to be instituted into the whole matter, with a view to a consolidation and codification of the law, and to the readjustment of the powers and duties exercised by the London County Council and the borough councils respectively. We are, therefore, of opinion that a Royal Commission should be appointed, comprising men of technical and expert knowledge, to consider the

whole subject." The Committee, having requested the opinion of the Works Committee on the subject, had received a presentation from them expressing views in substantial agreement with their own. On the recommendation of the Committee it was agreed to lodge a petition against the Bill. It was further reported by the Committee that communications on the matter had been received from the District Surveyors' Association, and the City of London Tradesmen's Club.

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE-STEEL.—VII.

DIPHTHERIA PAVILIONS: L'HÔPITAL DES ENFANTS MALADES, PARIS.

THE new buildings, of which some details are described in this article, were designed by Monsieur Belouet, Architecte de l'Assistance Publique, and the reinforced construction was executed in accordance with the Cottancin system.

Isolation Pavilions.—One diphtheria pavilion was already provided at the institution, this building being of ordinary construction with walls carried down to a masonry foundation. The floor was of brick with steel joists, and the walls of the wards of brick lined with timber. This pavilion was much criticised by Dr. F. Roux, the medical superintendent, who considered it very desirable to have a floor under which air could circulate freely, because, owing to the imprisonment of effluvia given off from the soil, the hygienic conditions of the building were far from satisfactory. He criticised also the door and window frames, in which microbes collected and multiplied, and the space between the roof covering and the ceiling, which he found in the same undesirable condition as the space below the floor. Consequently, when it became necessary to build two additional pavilions, Dr. Roux suggested the main features of the design which was subsequently prepared by the architect.

Two new pavilions have now been erected identical in size and arrangement, each having an internal area of 13.15 metres by 5.60 metres, as shown in Fig. 42, which is a typical ground plan. They are built upon ten reinforced brick piers, 33 centimetres square by 2 metres high, so that the floor of the pavilion is 2 metres above the ground level (see Figs. 40 and 41). The piers, situated at the four corners of the pavilion and at three intermediate points in each side wall, are founded upon six caissons, or rectangular brick chambers closed at the top and open at the bottom. These caissons, measuring 1 metre square by 0.6 metre deep, are sunk in the low-lying ground, which is very bad on the site of the hospital, consisting of made earth overlying the *débris* of the old quarries of Paris. The support afforded by the caissons was so satisfactory that no deformation of the building took place, the whole structure resting as a great beam upon the ten piers. The slab forming the top of each caisson is of concrete-steel, and situated 10 centimetres below the normal ground level. To prevent the caissons from being laid bare by rain, sills of reinforced brick were formed round the piers built upon the reinforced concrete slabs. Upon the ten piers was secured the framework of the floor, which consisted of a concrete-steel slab, with beams of concrete-steel 15 centimetres deep by 5 centimetres wide, having metal furring for the plaster ceiling, which forms an enclosed air space under the floor slab (see Figs. 40 and 41).

Along each outer edge of the floor two tiers of brickwork 6 centimetres thick were built 7 centimetres apart, forming hollow outer walls, the interior air spaces being in communication with the air space of the floor. A duct in reinforced brick (Fig. 40) was formed below the floor for the conveyance of warmed air from a calorifier. This warmed air first diffuses itself in the air space of the floor and then ascends by way of the hollow walls to the roof, which is formed of four hollow arches of concrete-steel, as shown in Fig. 41. Suitable outlets are provided in the roof for the discharge of the air. Thus, it will be seen that the pavilions are constructed with a double casing represented by floors, walls, and roof, respectively, and that, between the inner and outer surfaces, warm air circulates, which cannot enter any of the wards, and, consequently, cannot vitiate the air. Further, as the supporting piers are

not connected by walls, there can be no collection of unwholesome emanations from the soil.

The whole of the building is so reinforced in all details, and so tied together by steel, that it really constitutes a great tubular beam, 13.55 metres long by 5.98 metres wide by 4.59 metres high, formed by the floor, the two side walls, and the roof covering. This beam, so, it was unnecessary to employ lintels for windows and doors, as the openings could be formed much as they might be in a surface of steel plate.

The interior fittings are fixed by bolts to the construction of reinforced brick, so that, if any part of the woodwork becomes infested, it can be detached readily and burnt. The isolating partitions shown in Figs. 40 and 41 are of armed brick for a height of about 1.40 metres above the floor, and above that level they consist of glazed partitions. This arrangement applies also to the corridor, though the attendants are able to supervise the fire both in each pavilion as if no isolation existed between the wards.

The interior doors are in enamelled iron covered inside with plaster appropriately coloured by antiseptic paint, and a plain light is provided over each door.

The interior wall surfaces are rendered in cement and covered with glazed tiles. The grooved tiles often employed in the angle between the wall and the floor are replaced by a flat tile set at an angle of 45 deg. Taking the case of a tile with a concave surface, as in Fig. 43, the water used for washing the walls loses velocity between *a* and *b*, and lodges at *w*, trickling down the wall surface at *c*, and is carried away by the washing of the floor.

The method of glazing originally adopted being considered unsatisfactory, for the reason that angular corners existed encouraging the collection of dust and organisms, the architect had some frames made in iron with rounded corners, as in Fig. 47. These frames were constructed on the inside that the glass could be easily removed in case of need.

For the purpose of obviating the inconvenient features of this arrangement, Cottancin proposed the method of construction, of which characteristic details are represented in Figs. 45 and 46. All the parts here illustrated are of moulded glass, connected by means of steel rods, and the complete frames are held in position by means of horizontal bars of suitable section. The block illustrated in Fig. 45 is one forming part of a vertical bar. Through the holes *b b*, steel rods of 4 millimetres diameter are passed, being fixed by cement grout. The rebates and vertical grooves are to provide for fixing the glass on either side of the block as explained below. The blocks forming the top and bottom parts of the frame are illustrated by the two left-hand drawings in Fig. 46. In addition to the vertical holes in these, a groove is moulded in the top surface of the upper block, and a similar groove in the bottom surface of the lower block. The curved rebates in these blocks are made with grooves (not shown in the drawing) to provide for fixing curved segments (as *B*, in the lower right-hand corner of Fig. 46), which hold the glass in position. Referring to the sketches above that of the curved segment, *A* is the right-hand half of the block shown in Fig. 45 and *B'* a block having a projecting rib which fits into the groove in *A*. Immediately below these sketches is a horizontal section through the vertical bar of a window frame, *A'* being the fixed bar, *B'* the sills, fillets, and *f, f*, strips of antiseptic felt on either side of the sheets of glass. The sills *B'* are fixed by means of putty or cement of any suitable composition. This type of window frame obviates the use of expensive metal, and, the construction being entirely of reinforced glass, can be washed with antiseptics, and complies with all hygienic requirements.

Main Pavilion.—The roof covering of the main building for the treatment of diphtheria at the same hospital presents a very interesting study from the standpoint of construction as well as of hygiene.

In the first place, it may be mentioned that the problem for solution was to cover a room or hall measuring 28 metres long by 12 metres wide by a roof resting upon ordinary brick walls, 22 centimetres thick, without providing any intermediate support within the rectangle of 28 metres by 12 metres = 336 square metres

area. Consequently, it was necessary that the weight of the roof system should be uniformly distributed over the walls.

For a roof designed in the ordinary manner, the employment of wall plates capable of the acting as beams would be imperative, for the purpose of distributing the loads transmitted by the roof trusses in such manner as to avoid restraining the walls at certain points.

The architect proposed that the wall plates should consist of built-up steel girders, placed

as shown at A and B in Fig. 48, for carrying the trusses, spaced 4 metres apart, supporting the roof covering and the lantern. The medical staff, however, required the suppression of the members *ab*, *cd*, *ce*, *df*, *fe* (Fig. 48), in order to avoid the collection of microbes in this part of the structure. This demand involved the conversion of the lantern side partitions *ad* and *be* into two beams each 28 metres long. Taking into account the great span and the oblique push of the principals

AD and *BE* at the points *d* and *e*, colossal proportions would have been necessary for the beams *ad* and *be*, the weight of which would have been sufficient to crush the thin walls of the building.

A proposal was then made to construct in steel two tubular beams, *CDEH*, *CDEH* (Fig. 49), to carry the lantern and the roof covering. This project was equally impracticable because of the ungainly proportions and heavy cost of the structure.

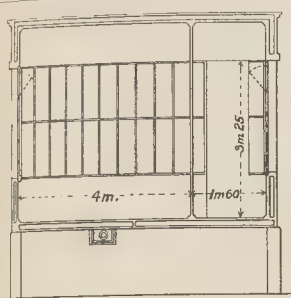


FIG. 40. Section A.A.

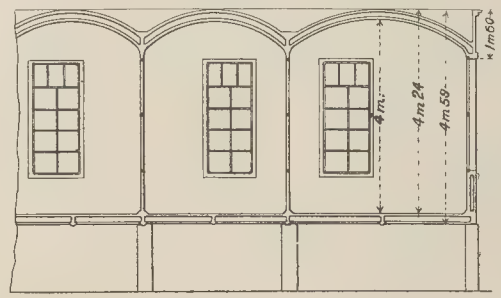


FIG. 41. Section B.B.

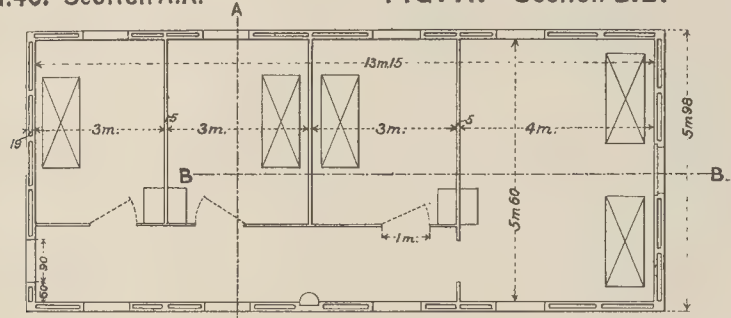


FIG. 42.



FIG. 43.

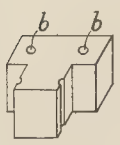


FIG. 45.



FIG. 44.

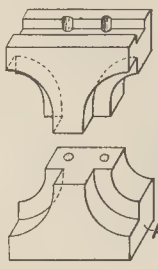


FIG. 46.

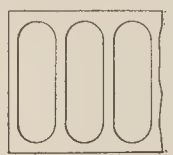


FIG. 47.

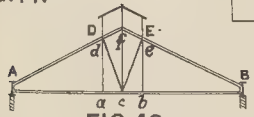


FIG. 48.

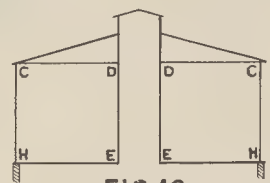


FIG. 49.

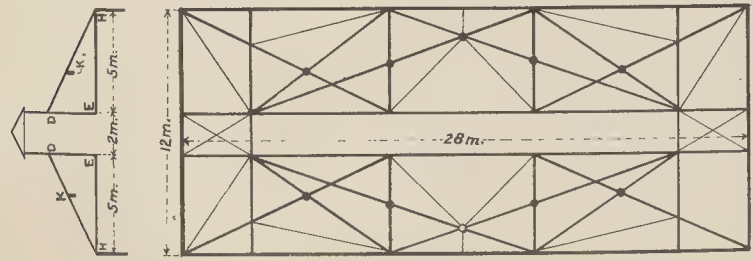


FIG. 50.

Illustrations to Student's Column.

The elegant solution proposed by M. Cottancin and accepted by the authorities was to make two tubular beams in concrete-steel of triangular form, as shown by the section in Fig. 50, placing above them a simple lantern. The sides ED, ED are in reinforced brick 7 centimetres thick, the horizontal members HE, HE in reinforced concrete 5 centimetres thick, with stiffening ribs 20 centimetres deep by 5 centimetres wide, following the triangulation in the plan (Fig. 50), and the inclined members HD, HD consist of a simple triangulation of reinforced concrete ribs, 20 centimetres deep by 5 centimetres wide, in the vertical plane of the triangulation of the members of the surfaces HE, HE. At the black points in Fig. 50 vertical members of concrete-steel reunite the systems of HE, HE to those of HD, HD. Below each triangulation of HD a vertical member K, parallel to DE, is provided, having timber furring, to which the rafters are nailed in the ordinary manner. The cement-faced roof slabs were covered with tiles at the request of the administration for the sake of appearance. This roof system is such as to comply with the hygienic requirements of the medical staff, and, virtually constituting a single monolithic beam with an opening in the middle, is a striking example of the adaptability of concrete-steel to building construction, as well as a testimony to the ingenuity of its designer.

Erratum.—On page 152, column 3, lines 27 and 28, the values 36,000 lb. and 52,000 lb. represent working stresses per sq. ft., not ultimate strength per sq. in.; the correct ultimate compressive strength per sq. in. being 1,500 lb. for cinder concrete and 2,166 lb. for stone concrete.

BUILDING ACTS AMENDMENT BILL.

A MEETING of the Incorporated Association for the Protection of Property Owners was held on Wednesday last week, at the London Institution, Finsbury-circus, when a paper was read by Mr. E. V. Huxtable on the London County Council's Building Acts Amendment Bill. Mr. Huxtable observed that a general feeling existed that the County Council had been extremely ill-advised in the method that they had thought fit to adopt in the introduction of the Bill. If he were asked to explain the object of the Bill he should reply that it was an attempt to improve London at the expense of the owners and occupiers. He afterwards analysed the divisions of the Bill, and produced a number of large diagrams showing how the Bill would affect property owners and occupiers should it become law. He suggested the advisability of a Royal Commission being appointed to consider if any amendments to the Act of 1894 were required. There appeared to be a consensus of opinion that the Bill, as at present drafted, should be withdrawn, and he had no doubt that this result would be attained if the citizens of London realised the arbitrary and inequitable nature of many of the important provisions, and if they organised immediate and concerted action to that end. A resolution was passed expressing a strong opinion that the Bill should be opposed at every stage in Parliament, and requesting those present to write to the Parliamentary representatives of the constituencies in which they resided asking them to do all in their power to prevent the measure being passed.—Sir J. H. Puleston, chairman of the executive committee, presided on the 9th inst. at the annual meeting of the City of London Conservative Association, held at 2, Gresham-buildings. Mr. Delissa Joseph moved that:—"This general meeting of the City of London Conservative Association views with concern the new London Building Bill about to be presented to Parliament by the London County Council, and regarding it as involving serious interference with the rights of property, and as tending to the restraint of trade and enterprise in the City of London, respectfully calls upon the City's representatives in Parliament to strenuously oppose its passing into law in its present form." He said that the Corporation had appointed a committee to watch the Bill, and the Aldermen had been instructed to call wardens to consider its provisions. The Lord Mayor, too, would probably be asked to call a meeting at the Guildhall to consider this very undesirable measure. The character of it was such that they felt bound to protest against it, and so strengthen the hands of their members when the Bill came before Parliament. The peculiar conditions of the City of London had been lost sight of by the promoters of the Bill, and the rights of property had been disregarded. Some of the clauses simply meant confiscation without

compensation. Existing business would be seriously interfered with were the Bill to become law. Mr. W. H. Fox seconded the resolution.—Mr. H. W. Russell moved as an amendment to delete the last four words of the resolution, viz., "in its present form," remarking that they did not want the Bill at all. Mr. F. Brinsley Harper seconded the amendment.—Mr. Deputy Millar Wilkinson denounced the Bill as a ruinous and dangerous measure.—Mr. S. Sankey said the Bill was utterly impracticable.—The Hon. Alban Gibbs, M.P., said the Bill would meet with uncompromising opposition in the House of Commons. He had no doubt that the good sense of the House of Commons would prevail, and that there would be very little chance of the Bill passing. There were about eighty clauses in it, each of which referred to another clause of another Bill. It looked as though the Bill were drafted with a view to prevent anybody understanding what the law on the matter was. Mr. Joseph accepted the amendment.—Mr. R. Davies, while hoping the Bill would be opposed by all the citizens, said the matter was not one of party politics, and should not be dealt with by a political organisation like theirs. The Chairman did not think there was anything at all wrong in bringing it on. The resolution, as amended, was then adopted.

At the meeting of the Council of the London Chamber of Commerce, Mr. Albert Spicer presiding, a special committee presented a report on the London Building Act Amendment Bill, with a recommendation that the observations and objections contained therein should be forwarded to the London County Council in response to the request of the latter body, and also that the Chamber should lodge a petition against the Bill, with the object of securing a *locus standi* to oppose objectionable provisions and secure amendments. In committee of the House of Commons, the report of the committee with the principal clauses of the Bill, with special reference to business premises of all kinds, it being pointed out that the interests of owners, occupiers, and others would be most prejudicially affected, especially owing to the absence of sufficient provision for arbitration or other form of appeal against the drastic requirements of the County Council. Objections were taken not only to the fire protection clauses, but also to the nature of the proposed amendments of the building law of the Metropolis. The committee direct the attention of the County Council to certain clauses which, in their opinion, required deletion or amendment. It was pointed out not to prove a source of material restriction of trade throughout the County of London. In addition to this restriction owners and occupiers of business premises in the administrative county would, it was pointed out, be placed at a serious disadvantage as compared with owners and occupiers in the provinces. On consideration of the recommendations of the special committee, several members of the Council of the Chamber expressed strong objections to the Bill, and the recommendations were confirmed, the presentation of the petition being authorised. The Council also passed a resolution to the same committee on the City of London (Metropolitan Council Fire) Bill, promoted by the Corporation of London, and approved arrangements for a general meeting of the Chamber to consider the County Council Bill, which will be held at the Chamber on the 16th inst. at 3 p.m.—The Association of Municipal and County Engineers have sent to the members of Parliament for metropolitan divisions and to all the metropolitan borough councils a copy of the following resolution, passed at a Council meeting of the Association held on February 11:—"That the London Building Acts Amendment Bill, 1905, apart from its drastic character and its interference with the powers and duties of the metropolitan borough councils, tends to further confuse and increase the working difficulties of the present laws relating to streets and buildings in the Metropolis, and in the opinion of this Association the Bill should be withdrawn and a new measure introduced consolidating into one Bill all the statutory provisions now necessary for governing the formation of streets and buildings, simplifying the present laws, and relegating to the borough councils all duties which in the opinion of Parliament can be properly entrusted to them, and thus relieve the London County Council of some portion of the enormous burden of work cast upon them."

The following, among a large number of other bodies, are petitioning against the Bill:—Institute of Civil Engineers, Institute of British Architects, District Surveyors' Association, Auctioneers' Institute, Surveyors' Institution, Builders' Institute, Institution of Electrical Engineers. There are drastic petitions against the Bill which is being promoted by the Corporation.

OBITUARY.

MR. JAMES THOMSON.—Mr. James Thomson, F.R.I.B.A., and I.A., of Messrs. John Baird & James Thomson, architects, Glasgow, died suddenly from heart failure. Mr. Thomson was born in Glasgow in 1835, and was trained as an architect in the office of the late Mr. John Baird, who assumed him as partner in the year 1858. Many important buildings throughout Scotland were erected from his designs. Chief among these were Belmont Castle, Perthshire, the seat of Sir Henry Campbell-Bannerman; Birkwood House, Lomahagow; Kinnaird House, Stirlingshire; and Gartshore House, the seat of Mr. Alex. Whitelaw. He was twice President of the Glasgow Institute of Architects, and also acted in a similar capacity in the architectural section of the Philosophical Society.—*Birmingham Post*.

MR. TYRRELL.—Mr. George Tyrrell, a well-known contractor for public works under the Government, died at Yarmouth on February 10, aged 84 years. He built the fort at Bombridge, Isle of Wight, the forts between Plympton and Plymouth, and the military works at Hurst Castle, and reconstructed the Royal Naval Hospital at Yarmouth; he restored the Haishborough light house, and constructed those at Calder and Tenby. Mr. Tyrrell built a great number of houses for various estate owners in Yarmouth, where he passed the closing years of his life in retirement.

GENERAL BUILDING NEWS.

CHURCH, BASFORD.—The new church of St. Aidan's, Basford, of which only the nave and aisles have as yet been built, is situated in Arnold-road. Accommodation for 500 people has been made, and the expenditure has been about 5,000. The architects are Messrs. A. Evans & Son. When completed the church will have a length of 80 ft. and a breadth of 24 ft., the material being Bulwell stone, faced with Coxbeech stone.

CHURCH, NEWCASTLE-ON-TYNE.—Commencement-stones were laid on the 8th inst. at the new Church of Scotland, Sandyford-road, Newcastle. The sections of the church are hall now being built, capable of seating 200 persons each, are expected to be finished in April. The site was purchased for about 1,000. The contractor is Mr. W. T. Ward and the architect Mr. F. M. Dryden.

HOLY TRINITY CHURCH, DUNDEE.—The work in connexion with the rebuilding of this church is now nearing completion. The exterior is practically finished, the decoration of the interior is almost so, and there remain only to be completed the furnishing and the paving. The architect of the building is Mr. Hewitt, Brighton.

MISSION CHURCH, MERRYMEET, CORNWALL.—The mission church of St. Mary the Virgin, at Merrymeet, Menheniot, was dedicated recently. The new building has been erected from plans drawn by Mr. J. Sansom, of Liskeard, and the contractors are Mr. H. Davy, Pengower Green, for the masonry, and Messrs. Russell & Son, for the carpentry. The building is 55 ft. long by 18 ft. 6 in. wide, and 20 ft. high to the apex of the wagon roof. By the introduction of fixed seats of pitchpine accommodation will now be found for 100 persons. The main entrance is at the south-west end through a porch, but the choir and clergy obtain ingress at the north-east corner of the church, where a small vestry and offices have been built.

CONGREGATIONAL SUNDAY SCHOOLS, BUNNYSIDE, SHEFFIELD.—This building has been erected at the rear of the existing church. There is a large schoolroom with end gallery, also infants' room, young men's and young women's rooms, and eight other classrooms, which may all be thrown into the schoolroom by means of glazed sliding screens. There is a room which will be used as a study library. The accommodation is for 650 persons seated, and the total cost, including furniture, will be about 2,000. The general arrangement is by Messrs. H. Boot & Son; the warming engineers are Messrs. W. G. Brothers; the roads and paths have been made by Messrs. Hadfield & Sons; and the architects are Messrs. C. J. Innocent & Son, all of Sheffield.

SCHOOL, GOVANHILL, NEAR GLASGOW.—Victoria Public School, Govanhill, was opened on the 10th inst. The site on which it is built consists of 5,825 sq. yds., and it gives accommodation for 1,286 pupils, and contains the usual classrooms there are a canteen and a workshop. The estimated cost of the building is about 20,000. The architects were Messrs. Danks & Purdie. The work was carried out under the supervision of Mr. Preston, the Board's master of works.

BUILDING IN BLACKPOOL.—The building trade in Blackpool during the past year has been very slack. The annual report of the Borough Surveyor states that it was the lowest for the last fourteen years, with the exception of 1892. The year of Blackpool's boom was 1892, but since then there has been a gradual decline, the number of houses certified for habitation having dropped from 1,066 in that year to 232 in 1904. Look-up shops in that year to 232 in 1904. Look-up shops also show a considerable decrease, only twenty-three plans having been approved last year as compared with sixty-two in 1903.

PROPOSED COTTAGES, COCKSTOWN, NEAR BURY.—On the 7th inst., an inquiry was held by Mr. Robert Agnew, Local Government Board Inspector, in the Courthouse, under a scheme for the building of thirty-eight cottages under the Labourers' Act. Mr. H. Alfred Mann, J.P., clerk to the Council, gave evidence, and said that the estimated cost of the scheme was 3,930l. Mr. Henry Shillington, C.E., architect of the scheme, was also examined.

NEW WING, ABERDEEN MATERNITY HOSPITAL.—The new wing of the Maternity Hospital in Convent-street, Aberdeen, was opened on the 5th inst. The new building consists of a basement and ground floor, and a ward is provided capable of containing a dozen patients. Accommodation has been made for the nursing staff, bathrooms, pantries, and larders, and the maternity-room has been fitted up with all the latest appliances. Mr. John Rust was the architect, and the contractors were:—Messrs. Mr. Robert Smith; painters, Messrs. Alexander, James & Son; plumber, Mr. David Ogilvie; plasterers, Messrs. James Bannochie & Son; slater, Mr. George Davidson; painter, Mr. William L. Leslie; electric light, Mr. John F. Anderson; bells, Messrs. Shirras, Laing, & Co.

LIBRARY, WAKEFIELD.—A memorial to the late Queen Victoria has just been unveiled at Wakefield, and the foundation-stone of a free library laid. The memorial to the late Queen takes the form of a bronze statue of Her Majesty, which has been erected in the public square known as "The Bull Ring." It has cost 1,000l. Mr. Williamson, of Esher, Surrey, has carried out the work. The free library will comprise lending and reference libraries, separate reading-rooms for women and children and men, and a magazine-room, with quarters for the librarian and caretaker. The brick walls are faced with dressed Huddersfield stone, and the roofs are to be boarded, tiled, and covered with Westmorland green slates. The principal contractors are Messrs. Bernal Brothers and Messrs. Bramall & Broadhead, two local firms, and they are carrying out the instructions of Messrs. Cox, Trimmell, & Davison, architects, of London.

FOREIGN.

FRANCE.—The committee appointed to consider the project for a tunnel under the Seine for the passage of the Metropolitan Railway from the Porte de Clignancourt, has adopted the scheme of M. Chagnaud, which is estimated to cost 15 million francs, and will require eighteen months to carry out.—At the Cluny Museum the rooms devoted to the collections left by MM. Arthur and Adolphe Reinhold have just been opened. The exhibition of "Femmes Peintres et Sculpteurs" has also just opened; it shows more of evidence than of attainment.—At the Luxembourg Museum M. Bénédict, the curator, has organised an exhibition of drawings by M. Rodin, the sculptor, which form a somewhat grotesque collection of annotations.—M. Georges D'Espèrès has been appointed curator of Malmaison and of the Imperial Museum there, which is not yet open to the public. The furnishing of the museum is being gradually carried out by the collection from all quarters of furniture and other articles of value formerly belonging to the Empress Josephine.—A committee has been formed to erect a monument to Gérôme in the Jardin de l'Infante at the Louvre. It is to be carried out by the sculptor, M. M. Marcel.—A monument to Taine, at Vouziers, will be inaugurated in June.—M. Boeswillwald has been elected President for 1905 of the Society of Architects of Havre; and M. Dulot President of the Society of Architects of Seine-et-Marne.—The Vieux Paris Committee has decided that the next exhibition of topographical illustrations of Paris is to deal with the quarter of the Marais, and the streets, quays, and interiors of the Ile Saint Louis.—The Société Nationale des Architectes has chosen as the subject for its next annual competition, "Un Hôtel pour un journal." A permanent exhibition of the best products of the masonry at Sèvres is to be organised at the Petit Palais.—The fine picture by M. Lhermitte representing "The morning arrival at the Halles," at present in

a small room at the Paris Hôtel de Ville where the public cannot see it, is to be transferred to the large gallery of paintings at the Palais des Beaux Arts.

CONCRETE-STEEL FLOORS AT THE GENERAL POST OFFICE, ORAN.—A recent example of concrete-steel flooring is to be found in the new General Post Office of Oran, Algeria, a building which has been constructed in accordance with the designs of M. Edouard Arnaud, Paris. All the floors were built on the Coignet system, in which tensile stress is resisted by reinforcement consisting of round bars and compressive stress by the concrete. In floor beams and joists, 4-in. diameter vertical tiles are provided for resisting sheer. The floor slabs are reinforced on the tension side by horizontal bars bent or near the ends, and also by transverse bars of smaller diameter. In the offices where the loading was heavy the floor slabs were provided with horizontal reinforcement bars in the compression area, as well as in the tension area, and the two series of bars were connected by vertical ties for resisting shearing stresses, and to bind the whole construction together. In certain cases the floor slabs were strengthened by the formation of ribs projecting from the under side, these ribs constituting floor joists.

MISCELLANEOUS.

SIR WILLIAM GRANTHAM AND THE CHAILEY RURAL DISTRICT COUNCIL.—The *Local Government Chronicle* states that it is authorised to deny the statement made by Sir W. Granttham at the meeting of the Surveyors' Institution on Monday last that the Chailey Rural District Council had tried to force on him the urban by-laws. The Chailey by-laws are word for word the same as the Rural model of the Local Government Board, and all that the Council required Sir William to do was to deposit intelligible plans. Instead of doing so, he wrote to them saying "the conduct of your Council is so inexplicable and intolerable that I must definitely break off negotiations with them, and defy them to do their worst." The Council have not sought to impose any restrictions on cottage building, and they have merely required the deposit of plans that would show what was intended to be built. The result of the prosecution was to show that Sir W. Granttham's "home-made plans" did not fulfil the requirements of the by-laws.

SOCIETY OF BRITISH SCULPTORS.—The statutory general meeting of the Society of British Sculptors was held at the galleries of the Royal Society of British Artists on Tuesday night for the purpose of electing the officers and council for the ensuing year. Mr. Thomas Brock, R.A., presided, and congratulated the members on the attainment of a long-desired object. Sculpture in England had of late made rapid strides, and there was no doubt that a society of this kind had now become a necessity and would do much, not only to protect the interests of the sculptors themselves, but to advance the art of sculpture in the knowledge and appreciation of the public. The result of the ballot was declared as follows:—President, Mr. Brock; treasurer, Sir C. Lewis-Wittewronge; secretary, Mr. Percy Edsall; council, Mr. A. Drury, Mr. G. Frampton, Mr. W. S. Frith, Mr. F. Lynn Jenkins, Mr. W. Goscombe John, A.R.A., Sir Charles Lewis-Wittewronge, Mr. T. S. Lee, Mr. D. McGill, Mr. F. W. Pomeroy, Mr. Reynolds-Stephens, Mr. Hamo Thornycroft, and Mr. F. D. Wood.

PHOTOGRAPHIC SURVEY AND RECORD OF SURREY.—The annual meeting of this Association, formed for this purpose, will be held in the Council Chamber, Town Hall, Croydon, at 5.45 p.m., on Saturday, March 11, when the President, Viscount Midleton, will give an address, and the report of the Council and the accounts of the year ended December 31, 1904, will be submitted. The meeting is open, not only to members of, and contributors to the survey, but to all interested in the work and aims. Arrangements have been made for an exhibition, consisting of a representative selection from the 1,300 prints already in the survey collection, in the lecture-room, Town Hall, Croydon. This will be open on the day of meeting, from 7 to 9 p.m., and again on the following Monday, Tuesday, and Wednesday, from 3 to 5 p.m., and 7 to 9 p.m.

DRAINAGE PLANS.—Greenwich Borough Council, at its last meeting, expressed disagreement with the views contained in a circular letter from the Royal Institution of British Architects urging that the London County Council by-laws respecting the deposit of drainage plans should be modified so that they should only require the submission of a block plan, and a written description of the pipes and apparatus. The Council, however, decided to inform the

Spring Garden authorities that the by-laws might, with advantage, be amended by clearly defining the meaning of the exemption clause contained at the end of by-law 2, which is, in their opinion, somewhat ambiguous. The clause referred to is as follows:—

"These by-laws shall not be deemed to require the deposit of any plans, sections, or particulars in the case of any repair which does not involve the alteration or the entire reconstruction of any pipe, drain, or other means of communicating with sewers or the traps or apparatus connected therewith."

Marlybone Borough Council concurs in the views of the Royal Institution of British Architects.

EAST-END DWELLINGS COMPANY.—The report submitted to the twenty-second ordinary general meeting of the Company, held on the 13th inst., states that Tonbridge Houses, on the Cromer-street Estate, which contain seventy-eight tenements, were finished and opened late in the autumn, and, as was anticipated, were rapidly taken up, and at the close of the year there was no tenement unlet on the whole of that estate. The letting of the Company's other properties has been satisfactory, with the exception of the buildings in and near Victoria Park-square and Globe-road, Bethnal Green. The reduced scale of rents which were adopted towards the end of 1903 in respect of these buildings had a good effect for a time, but in the summer and autumn the letting again fell off. The directors have decided to further reduce the rents in the hope of securing sufficient tenants to fill the buildings. The new buildings in Old Ford-road, Bethnal Green, which have been named "Evesham Houses," are expected to be ready for occupation early in the new year. They will comprise 120 rooms, divided into ten tenements of four rooms, ten of three rooms, and ten of two rooms, each with scullery and water-closet. These buildings differ from most of the Company's other dwellings in the same neighbourhood, inasmuch as each tenement is self-contained, and it is hoped that they will readily let.

MURAL TABLET, HEXHAM.—It has been decided to erect a mural tablet in the Abbey Church in memory of the late Capt. L. W. Atkinson. The tablet, which has been designed by Mr. C. E. Hodges, will be of alabaster and white marble, measuring about 8 ft. by 5 ft. The execution of the work will be entrusted to Mr. Milburn, sculptor, York.

PRESS-BUTTON ELECTRIC LIFTS.—We have recently had an opportunity of inspecting a press-button electric lift made by Messrs. Joseph Richmond & Co., of Hatton-garden, E.C., which seems to us to be deserving of special mention, as many of the objections to this type of lift have been overcome. A study of the complete specification for this type of lift granted to Messrs. Richmond & Carey has convinced us that their design is theoretically sound, and, considering the very complex operations which have to ensue when the button on any floor is pressed, their solution is, comparatively speaking, a simple one. When the button on any landing is pressed all the buttons on the other floors are locked instantaneously, and the lift, whether it be above or below the landing, at once moves there and automatically unlocks the door. The mere action of opening the door breaks the electric circuit, so that it is impossible for the lift to move with the door open. On entering the cage the weight of the passenger on the cage floor closes a switch, which keeps the buttons on the landing locked, and thus the lift cannot be interfered with from the outside whilst in action. There are press-buttons inside the lift; the passenger presses the one for the floor which he wants, and the cage at once moves there and stops. In the unlikely event of two persons pressing buttons on different floors at exactly the same instant the car will travel to the floor farthest from that at which the cage was at rest. The method by which all this is done is fully explained in the specification, and it is most instructive to the electrician to trace out all the connexions. There are many distinctly novel features in the arrangements which will be appreciated by electricians. Several of these lifts have now been working satisfactorily for some months.

WAR MEMORIAL, SALISBURY.—The memorial which has been placed in Salisbury Cathedral in memory of the officers, non-commissioned officers, and men of Wiltshire who lost their lives in the South African war was unveiled on the 4th inst. The memorial was designed by Mr. Alexander Fisher, Kensington, and consists of a panel in copper, on which is mounted an inscription with the names in enamel on silver-gilt. Above is a circular bronze relief of two figures representing Death raising the fallen.

OAK SCREENS, BENHILTON CHURCH, SUTTON.—Three new oak screens were unveiled in this church a short time ago. They were executed

by Messrs. Harry Hems & Sons, of Exeter, from S. Desmar, architects, of London.

ROYAL SCOTTISH ACADEMY.—At the general assembly of the Royal Scottish Academy, held in Edinburgh on February 8 the following Associates were elected Academicians:—Mr. J. Kinross (architect), Mr. W. Birnie Rhind (sculptor), and Mr. E. A. Walton (painter), all of Edinburgh. Mr. Kinross is the architect of a large mansion now being built for Sir James Miller, of Manderston; Mr. Birnie Rhind is the sculptor of the memorial to the 2nd Dragoon (Scott Grey) to be erected in Princes-street, and is commissioned to execute a bronze statue, 9 ft. high, of Colonel Light, who founded the City of Adelaide, South Australia, in 1836; Mr. Walton, who studied in Düsseldorf and London, is well represented in several picture galleries on the Continent of Europe. Sir James Guthrie, President R.S.A., has just been elected, under the provisions of Rule II. of the club, a member of the Athenaeum Club, London.

MATERIAL FOR CEMENT IN CEYLON.—Professor Wyndham R. Dunstan, F.R.S., Director of the Imperial Institute, in a first report on the mineral survey now in progress in Ceylon mentions that among the deposits analysed were one of secondary limestone or travertine and one of ricefield mud, both from the district of Hangliella Oya. They both proved to contain all the elements requisite for the preparation of Portland cement of good quality, and it is proposed to use them in conjunction for that purpose.

Legal.

TRADE UNION DISPUTE:

ACTION BY A STONEMASON.
In the Court of Appeal, consisting of the Master of the Rolls and Lords Justices Mathew and Cozens-Hardy, on the 10th inst., the hearing was concluded of the case of *Airey v. Weighill* and others, on the application of the four defendants, Weighill, Thomson, Stagg, and Elliott, for judgment or new trial on appeal from verdict and judgment at the trial before Mr. Justice Grantham and a special jury at Newcastle-on-Tyne.

The action was brought by the plaintiff, a stonemason, against the defendants, Weighill, Thomson, and Stagg, the trustees of the Friendly Society of Operative Stonemasons, Rawson and Elliott, the president and secretary of the Sunderland district branch of the Society, and Armitage, McConnell, and Shann, members of the Sunderland branch of the Society, for damages for having unlawfully and maliciously procured and induced the plaintiff's employer to put an end to the plaintiff's employment. The plaintiff also claimed an injunction to restrain the Society from interfering with any persons with a view to causing them to break their contracts with the plaintiff, or to cease to employ him, or to abstain from entering into contracts with him, and from otherwise molesting or interfering in any manner with the plaintiff in following his calling. The facts were these:—The plaintiff was formerly a member of the Friendly Society of Operative Stonemasons, but on becoming a foreman he ceased to be a member of that Society, and became a member of the Foremen's Union. Owing to depression in the Foremen's Union, on March 15, 1904, went as a stonemason into the employment of a Mr. Shaftoe, a building contractor in Sunderland. On that day, the defendant, Armitage, who was what was called the "shop steward," asked plaintiff if he was prepared to join the Society, and the plaintiff replied in the negative. On March 21 a meeting of the district branch was held, but there was a dispute as to what took place at that meeting. On March 22 the plaintiff was asked again whether he would become a member of the union, and again refused. The other workmen in Mr. Shaftoe's employment, all of whom were members of the Society, then, as plaintiff alleged, in accordance with instructions given by Armitage and other defendants, agreed to determine their employment by giving an hour's notice, and proceeded to do so. Mr. Shaftoe asked the reason of this, and the reply was that plaintiff was not a member of the union, and refused to join it. The result was that plaintiff received an hour's pay and his employment was terminated. The plaintiff had been in receipt of wages at the rate of 8s. a month, and he remained out of employment for a month. The four appellants were the only defendants who entered an appearance to the writ, the other defendants making default. At the trial Elliott stated that, at the meeting of March 21, the lodge passed a resolution forbidding the men to bring about the plaintiff's discharge, but no minutes of the meeting were produced. The jury found that

Rawson, Armitage, Shann, and McConnell ordered the men to send in their notices to Mr. Shaftoe to compel him to get rid of the plaintiff; that they acted as they did act to force the plaintiff to join the Society, and to get him dismissed from his work if he did not join; that they acted as they did with the approval of the lodge; but that they did not act with a malicious intent to injure the plaintiff apart from forcing him to join the Society. The jury assessed the damages at 8s., and judgment for that amount was entered for the plaintiff. Hence the present application.

Mr. Athorley-Jones, K.C., and Mr. Edward Shortt appeared for the appellants, and Mr. Eldon Banks, K.C., Mr. Gawan Taylor, and Mr. A. Robinson for the respondent on the appeal.

Mr. Athorley-Jones contended that no actionable wrong had been committed by any of the defendants, and secondly, that if any wrongful acts had been committed, the persons who did the wrongful acts were not acting as agents of the defendant Society. Here the object of the defendants was to maintain the existence and the successful working of their union. That was perfectly lawful object. In the second place, the learned counsel submitted there was no evidence of any authority from the defendant Society for the acts done by individual defendants. The action of the men was spontaneous, and was not prompted, induced, or suggested either by the lodge or by the defendant Society. The evidence of Elliott showed that the men acted in defiance of a resolution of the lodge.

Mr. Banks submitted, on behalf of the respondent, that on the first two findings of the jury there was clearly a cause of action against somebody. The conduct of all persons concerned and the result showed clearly that, whether or not the lodge passed such a resolution as Elliott spoke of, the men obtained the sanction of the lodge for what they did. He contended that the jury were justified in coming to the conclusion that the lodge did not prohibit the men from acting as they did, and that, in fact, the men acted with the approval of the lodge. No distinction could be drawn so far as liability was concerned between the lodge and the Society, and the Society was responsible for the acts of its local agents and managers.

At the conclusion of the arguments the Master of the Rolls, in giving judgment, said the first point was the general question whether any cause of action had been established against anyone. That question opened a very wide field for investigation. The other point was the question whether, supposing any wrongful acts giving rise to a cause of action had been committed by anyone, the trade union itself could be held responsible for them. On this latter point alone he proposed to give judgment. He would not deal with the question, whether, on the facts, any cause of action whatever accrued to the plaintiff. But the question he would deal with was whether there was any evidence for the consideration of the jury of responsibility on the part of the trade union itself for the acts of Rawson and Armitage. They were officers of the lodge, but before the plaintiff could succeed he must fix the trade union itself with responsibility for their acts. Unless their acts were such as to make the union responsible for them the plaintiff must fail. In his opinion, the onus of proving that the union was responsible for the acts of individuals was on the plaintiff. Approval might cover ratification, but there was no evidence of any ratification in this case, and that point was not argued. In order to support the conclusion the jury had arrived at it was necessary for the jury to have found that there was a resolution of the lodge authorising the strike. He thought there was no evidence to justify the finding of the jury on that question. There was no trace of assent on the part of the union to what the application must be admitted, and judgment entered for the defendants.

The Lords Justices concurred.

DISPUTE AS TO PAVING EXPENSES.

The case of the Mayor, etc., of Hampstead v. The Midland Railway Company came before the Court of Appeal, consisting of Lords Justices Vaughan Williams, Romer, and Stirling, on the 13th inst., on the appeal of the Railway Company from the judgment of Mr. Justice Bigham on a special case stated for the opinion of the Court on a question of law arising in the action. The case in the Court below was reported in the *Builder* of August 12, 1904.

The action was brought by the plaintiffs to recover from the defendant Company 1,200l. 12s., the apportioned amount they

alleged to be due from the Company as the estimated expenses of paving a portion of a new street called Westbere-road, Hampstead. The facts were shortly these:—The plaintiffs, on June 4, 1903, resolved to pave Westbere-road, and on September 1, 1903, served the defendants with notice demanding from them the sum alleged to be due from defendants as the owners of land "bounding or abutting" on the new street. Defendants contended that they were not the owners of the land in question within the meaning of the Metropolis Management Acts 1855 and 1862, and therefore not liable for the expenses in question. It appeared from the special case that the defendants acquired the land, and held it subject to the provisions of section 15 of the Midland Railway Act, 1900, and which provided for the protection of the owner that the Company should not use any part of the sidings to be placed on the land acquired from him for any purpose except for the purpose of empty passenger trains; that the Company should acquire all the land of the owner up to Westbere-road, and should leave a strip of land 20 ft. wide along the whole length of Westbere-road, and should, at their own expense, plant and maintain the same with shrubs and trees to the reasonable satisfaction of the owner, and also fence off the land from the Westbere-road by an iron fence, 7 ft. high, the planting and fencing to be carried out within one year from the Company getting possession of such lands. The Company duly acquired the land referred to, and left a strip of land, 20 ft. wide, along and contiguous to the whole length of the west side of Westbere-road, and dealt with it in the manner provided by the section. They fenced off the land from the Westbere-road by an open, unclimbable fence, 7 ft. high, and planted a quick-set hedge immediately inside the fence along its whole length. On the other side of the strip of land the land sloped down to the edge of the railway, a cutting having been made for the purpose of its construction. The plaintiffs contended that the defendants were "the owners" of the land "bounding and abutting" on the new street within the meaning of the Metropolis Management Act, and were therefore liable for the amount claimed. The defendants, on the other hand, contended that the land was not land bounding or abutting on the street within the meaning of section 77 of the Metropolis Management Act, 1862; that the land was subject, in perpetuity, to the use of the public and private rights which the burden of it of beneficial value to the defendants, and was not such land as was intended by that section; and that the defendants were not the owners of the land within the meaning of that section, and sections 102 and 103 of the Metropolis Management Act, 1862.

Mr. Justice Bigham held that the result of the decisions bearing on the subject was that when land was incapable of yielding rack-rent by reason of some public use on or over such land, the owners of such land were not the owners of land within the meaning of the Metropolis Management Acts, and thus not liable to contribute in respect of such land to the expenses of paving a new street. But where the burden of the land was imposed for the benefit of some individual or set of persons, the owners of such land were not relieved from having to contribute towards those expenses. In the present case the burden was placed on the land in question for the benefit of a Mr. Powell-Cotton by a private Act of Parliament, and it was competent for him, by contract with the defendants, to release them from their obligation towards him in respect of the land. In the other case, therefore, that the defendants' contention failed, and gave judgment for the plaintiffs for the amount claimed, with costs. Hence the present appeal of the Railway Company. Mr. Montague Lush, K.C., and Mr. Wm. Wills appeared for the appellants, and Mr. Macmorran, K.C., and Mr. Courtthorpe for the respondents.

At the conclusion of the arguments of counsel their lordships affirmed the decision of Mr. Justice Bigham, and dismissed the appeal, with costs.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

1,339 of 1904.—N. REID: *Construction of and Method of Firing Kilns for Use in Firing Bricks, Tiles, Pipes, and other Earthenware Goods.*

This consists of revolvable pottery and other shaped kilns for use in firing pottery mounted on a cast metallic plate having a

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

metallic shaft secured centrally to its underside at right angles to its upper surface, or nearly so; to enable the lower end of such shaft to rest on or to a metallic foot-step attached to the wall or to a brick, concrete, or like suitable bed or foundation, a suitable number of metallic brackets secured to the underside of such metallic plate near to its periphery at an equal or suitable distance apart with metallic rollers or wheels fitted thereto for bearing down and travelling upon a metallic plate, a track, a single upon a double-headed, or flanged metallic line of rails secured to wood or metallic sleepers to a brick or a concrete or like suitable foundation, a stationary or movable roller to travel upon metallic plates or rails, rollers to sleepers, to brickwork, or to the ground adjacent according to the shape of the shaft.

3,659 of 1904.—E. H. PARKES: *Roller Blinds and their Fittings.*

A roller blind, consisting of a top roller upon which the blind is wound, a longitudinal undercut groove in said roller, a bottom roller provided with a similar groove, corresponding to the top roller, and a blind adapted to fit into either groove, and means for preventing the rods accidentally working longitudinally out of the grooves.

3,947 of 1904.—J. T. HURLEY: *Operating Bulkhead and other Doors.*

A valve for operating bulkhead and other doors having valves so arranged that pressure and exhaust will flow in either direction through the valve casing to the cylinder, and which may be operated, but will only reverse the flow through the valve casing when the pressure and exhaust to and from the valve casing are in one of the two directions.

6,137 of 1904.—G. H. ADDENBROOK: *Apparatus for the Prevention of the Condensation of Moisture on Windows or other Surfaces, and for the Preservation of Goods in the Neighborhood thereof.*

This consists in the combination of calcium chloride or other deliquescent substance with a mechanical fan, applied for the purpose of absorbing the moisture in the atmosphere in shop windows, show cases, and other enclosed or air-tight compartments or receptacles.

6,189 of 1904.—G. H. GOODENOUGH: *Chimney Ventilating and other Cowl.*

An revolving cowl attached to a spindle extending down into a tube or casing carried by the shaft of the cowl, the said spindle at its lower end running on anti-friction balls, and at its upper end being provided with a passage through which the lubricant can flow into the interior of the tube.

6,544 of 1904.—H. HOPE & SONS, LTD., and F. G. STERNBERG: *Fluorescent Windows or the like.*

A fluorescent window or the like, provided with hinged cheeks, the flanges or bars supporting which are arranged so that they can be moved relatively with the window to allow the latter to be turned down, and so that the weight of the said bars will normally tend to retain them in their proper position for supporting the window.

6,583 of 1904.—A. BARR: *A Portable Platform or Support for Use when Cleaning Windows, and for other Purposes.*

This invention relates to a portable platform or support for use when cleaning windows, and for other purposes. The invention consists of a small platform which is hinged to and supported on a frame which may be of rectangular shape, and this frame has at its upper end lateral screws which can be arranged to screw into or out of a cross tube, which latter may form the top of the frame. The screws have preferably end pieces or blocks on them which are adapted to fit into the pulley sills of the window sash.

7,571 of 1904.—H. E. CATER and H. P. BELL: *Paving Tiles or Slabs for Walls, Ceilings, and the like.*

A backing material for glass sheets destined for use as facing tiles, said material comprising a powdered mineral matter, such as whiting, a varnish gum, and a non-drying oil, with or without added materials, such as coloring matter.

7,597 of 1904.—W. HERBERT: *Ceilings.*

A ceiling, consisting in the combination of a bearing member of concrete, arranged on edge, reinforced with an iron insertion, and made in one piece before erection, a filling member having round or chamfered upper edge, and formed before erection of light hydraulic moulding material or burnt clay, and of a covering layer having with these parts, and formed of concrete or other suitable material.

17,807 of 1904.—C. W. GOSS: *Apparatus for Straining, Tightening, and Fastening Wire or Strands in Fences, and the like.*

An apparatus for straining, tightening, and fastening wire or strands in fences and the like, having a bracket secured to a post or upright, and a rotatable winding spindle (with square end), mounted thereon, to which the end of the wire is secured, an abutment or slot on the outside face of the bracket adjacent to the square end of the winding spindle, and a key which, when inserted between the square end of spindle and the abutment, locks the winding spindle, or, when removed, releases it.

23,744 of 1904.—T. MILLS: *Fireplaces of Brick-burning Kilns, and the like.*

A fireplace of brick and like kilns, consisting in the employment of air admission holes or passages in the front of the fireplace, at each side of the fuel discharge aperture, communicating with the interior of the combustion chamber.

27,029 of 1904.—S. W. CRAMER: *Humidifiers and Air-Moistening Apparatus.*

A humidifier, consisting of a casing, a shaft, and exposed motor wheel, and a propeller supported on said shaft, a plurality of spray heads provided with means for supplying an elastic fluid under pressure, a liquid supply pipe, and concentric and detachable nozzles, one of which is adjustable for producing an elastic aqueous vapour and directing said vapour against the motor wheel.

25,289 of 1904.—T. PODMORE: *Building Blocks.*

A method of veneering artificial stone which consists in depositing a layer of cement on the face of the block, sprinkling granular material thereon, tamping said granular material, and finally smoothing the surface of the block by rubbing or grinding the exposed granules so as to present a raised rock face in imitation of cross-cut chiselled stone.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and living addresses.

Any communication to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

February 6.—By OGDEN, SONS, & O'LEARY, Brixton.—2 and 4, Cranmer-rd. (s. and flats), u.t. 793 yrs. g.t. 241, y.r. 288. 52,100

February 7.—By ADAMS, BIST, & WATTS, Clerkenwell.—2 and 8, Upper Baker-st., u.t. 61 yrs. g.t. 101, y.r. 781. 175

5, Upper Chadwell-st., u.t. 71 yrs. g.t. 91, y.r. 601. 110

King's Cross.—7, Tiber-st., u.t. 37 yrs. g.t. 41, w.r. 331, 10s. 205

Caledonian-rd.—48, Miel-st., u.t. 77 yrs. g.t. 51, 5s. 200

41, Edward-sq., u.t. 98 yrs. g.t. 51, y.r. 341. 255

Finsbury Park.—24, Palmerston-rd., u.t. 604 yrs. g.t. 126, w.r. 12s. 235

By J. M. LAMBE & SON (at Swansea), Pantyffynon, Carmarthen.—The Rhos Colliery, mineral area 1,878 acres, part f. and part u.t. 6 to 32 yrs. (as a going concern, exclusive of valuations). 13,000

February 8.—By FURBERS, Tottenham.—Beaconsfield-rd., f.g. rents 96s., reversion in 71 yrs. (in lots). 2,395

Clyved, f.g. 81, 8s., reversion in 71 yrs. 235

Brunswick-rd., f.g. 121, reversion in 71 yrs. 800

By KNIGHT & CO., Notting Hill.—58 and 59, Stoneleigh-st., u.t. 43 yrs. g.t. 121, w.r. 781. 510

Dulwich.—113, Crystal Palace-rd., u.t. 60 yrs. g.t. 61, 6s. 290

111, Crystal Palace-rd., u.t. 60 yrs. g.t. 61, 6s. 275

111, Crystal Palace-rd., u.t. 60 yrs. g.t. 61, 6s. 195

Walworth.—23, Heygate-st., u.t. 38 yrs. g.t. 41, 12s. 820

By T. D. PALFREY, Regent's Park.—Berkeley-rd., f.g. 181, reversion in 42 yrs. 620

By A. DOWELL (at Edinburgh), Fowls Wester, Perthshire.—The estate of Gleadmoor, 11,000 acres. 572,800

February 9.—By E. H. HENRY, Peckham.—11 and 13, Hardcastle-st., u.t. 561 yrs. g.t. 121, w.r. 751, 8s. 530

By NEWTON, EDWARDS, & SHEPHERD, Barnsbury.—139, Hemingford-rd., u.t. 371 yrs. g.t. 71, e.r. 451. 425

Holloway.—45, Hungerford-rd., u.t. 561 yrs. g.t. 61, y.r. 451. 475

By WESTON & SONS, Croydon.—161, 163, 175, 177, and 179, Bynes-rd., f., w.r. 1101, 10s. 1,080

Thornton Heath.—56 and 58, Frant-rd., and land adjoining, f., w.r. 931, 4s. 870

By C. G. & T. MOORE, Mile End.—137 and 139, Mile End-rd. (s.), area 5,500 ft., f., y.r. 1001. 1,700

561, Mile End-rd. (s.), area 3,100 ft., y.r. 1001. 1,380

Bow.—40 and 50, Bow-rd., f., y.r. 1001. 1,450

52, Bow-rd., u.t. 49 yrs. g.t. 51, 10s. e.r. 601. 480

6, Mornington-rd., f., y.r. 361. 500

11, Mornington-rd., u.t. 48 yrs. g.t. 41, 10s. 485

17, Mornington-rd., u.t. 48 yrs. g.t. 81, y.r. 401. 350

27, and 28, Mornington-rd., f., y.r. 1071. 1,800

44 to 48, Mornington-rd., u.t. 48 yrs. g.t. 191, y.r. 1751. 1,755

Bow-rd., f.g. 401, u.t. 48 yrs. g.t. 121. 430

10 and 11, Eleanor-st., f., w.r. 651. 935

Eleanor-st., f.g. 31, reversion in 48 yrs. 115

By BARBER & SON (at Wellington), Allscott, Salop.—"Allscott Farm," 101½ a., f. 4,200

Three freehold cottages and gardens. 270

Contractions used in these lists.—F.g. for freehold ground-rent; l.g. for leasehold ground-rent; l.g. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cro. for croft; av. for avenue; mns. for mansions; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

FRIDAY, FEBRUARY 17.

Institution of Mechanical Engineers.—Fifty-ninth Annual General Meeting, when the Annual Report of the Council will be presented to the Meeting, the results of the Ballot for the Annual Election of the President, Vice-Presidents and Members of Council will be announced, and the adjourned Discussion on the American Visit, 1904, will be resumed. The Paper to be read and discussed is entitled "The Strength of Columns," by Professor W. E. Lilly. 8 p.m.

Northern Architectural Association (Students' Sketching Club).—Annual Social Gathering and Exhibition of Sketches and Measured Drawings, in the Hall of the Church Institute, Hood-street. 7.30 p.m. to 10.30 p.m. 8 p.m.

SATURDAY, FEBRUARY 18.

Edinburgh Architectural Association.—Dinner of the Association. 7 p.m.

MONDAY, FEBRUARY 20.

Royal Institute of British Architects.—Mr. Reginald Blomfield, A.R.A., on "Architectural Education." 8 p.m.

Glasgow Philosophical Society (Architectural Section).—Mr. R. Paterson on "The House as a Place to Live In." 8 p.m.

Liverpool Architectural Society.—A selection of Plates by Mr. G. E. Thompson. Subject: "Architecture of Many Countries." 8 p.m.

Society of Arts (Lectures).—Mr. Dugald Clerk on "Internal Combustion Engines," II. 8 p.m.

TUESDAY, FEBRUARY 21.

Institution of Civil Engineers.—Papers to be further discussed:—(1) "Alfreton Second Tunnel," by Mr. E. F. Cramble Funnell, M.A.; (2) "The Reconstruction of Moncreiffe Tunnel," by Mr. D. McLellan. 8 p.m.

Northern Architectural Association (Students' Sketching Club).—Annual General Meeting. Discussion of Prize Essays. 7 p.m.

Institute of Sanitary Engineers, Ltd. (Lectures in Practical Sanitary Science).—Mr. A. A. H. Scott on "Quantities and Measurements of Sanitary Works." 7 p.m.

Society of Arts (Applied Art Section).—Mr. M. H. Spielmann, F.S.A., on "The Queen Victoria Memorial as Compared with other Royal Memorials." Mr. John Belcher, A.R.A., will preside. 8 p.m.

WEDNESDAY, FEBRUARY 22.

London Master Builders' Association.—Annual Dinner, and Presentation to Mr. J. Howard Colls, at the "Emple Hall" Trocadero Restaurant, Piccadilly-circus, W. 8.30 p.m.

Edinburgh Architectural Association.—Mr. C. E. Elcock on "Through York with a Camera," illustrated by lantern slides. 8 p.m.

THURSDAY, FEBRUARY 23.

The Quantity Surveyors' Association (Incorporated).—Annual Dinner, Freemasons' Tavern, Great Queen-street, W.C. 8.30 p.m.

Carpenter's Hall, London Wall (Free Lectures on Matters Connected with Building).—Rev. Walter Marshall, M.A., F.S.A., on "Our Old Parish Churches." 8 p.m.

Architectural Society, King's College, W.C.—Mr. R. P. Jones, M.A., on "Saracenic Architecture in Cairo," illustrated by lantern slides. 5.30 p.m.

Royal Institution.—Mr. J. H. Teall, M.A., on "Recent Work of the Geological Survey," II. 5 p.m.

Leeds and Yorkshire Architectural Society.—Mr. Maurice B. Adams on "Modern Libraries." Continuation of discussion on Mr. G. L. Addenbrooke's paper on "The Value of Overhead Mains for Electric Distribution in the United Kingdom." 8 p.m.

Society of Antiquaries.—8.30 p.m.

Tramways and Light Railways Association (Society of Arts, John-street, Adelphi, W.C.).—Mr. Herbert Jones on "The Waterloo and City Railway." 8 p.m.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered
*Plans and Designs for Cottages	Cheap Cottages Exhibition	Not stated	Mar. 25, 06

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Paviors' Labour for Tramways	Rochdale Tramways Committee	S. S. Platt, Borough Surveyor, Town Hall, Rochdale	Feb. 20
Points, Crossings, and Special Work for Tramways	Stockport Corporation	J. Atkinson, Borough Surveyor, Stockport	do.
Road Materials	Towcester R.D.C.	W. Sheppard, Surveyor, Towcester	do.
Two Iron Bandstands	Beckenham U.D.C.	J. A. Angell, Surveyor, Council Office, Beckenham	do.
Public Convenience, Balcarres-street, Morningside	Edinburgh City Council	Burgh Engineer, City-chambers, Edinburgh	do.
Waltham, Balcarres-street, Morningside	do.	do.	do.
Repairs, Old and New Quays, Campbelltown	Harbour Committee	J. Fullerton, Burgh Surveyor, Campbelltown, Scotland	do.
Alterations to Drains	East Preston Guardians	F. Howard, F.S.I., Town Office, Littlehampton	do.
Mortuary, East Preston Workhouses	Steynton Local Managers	D. E. Thomas, Architect to P.E.A., 17, Victoria-pl., Haverfordwest	do.
Matchboarding Cellings at Bolton-hill Council School	Edinburgh Corporation	R. Morham, City Arch. Public Works Office, City-chambers, Edinburgh	do.
Painters' Work, Dewar-place Electricity Station	Glasgow Corporation	Office of Public Works, City-chambers, Glasgow	Feb. 2
Painters' Work, McDonald-road Electricity Station	Steyning Guardians	E. Cripps, Clerk, Union Offices, New shoreham, Sussex	do.
Alterations on St. Andrew's Hall	Boothle Corporation	Borough Engineer's Office, Boothle	do.
Infirmaries, Nurses' Home, etc., Kingston-by-Sea	East Ham Borough Council	W. C. Uthman, Engineer, Nelson-street, East Ham, E.	do.
Private Improvement Works	Leicester Parks, etc., Committee	E. G. Mawbey, Borough Engineer, Town Hall, Leicester	do.
Five Double-deck Roof-covered Trams	do.	do.	do.
Wrought-iron Hurdle Fencing	Foleshill R.D.C.	A. P. Oswin, Council Offices, Little Heath, Foleshill	do.
Drains and Water Closets	Woodford U.D.C.	W. Farrington, Surveyor, Council Offices, Woodford Green	do.
Granite	do.	do.	do.
Forty C.I. Manhole Covers & S.C.I. Lamphole Cyl.	do.	do.	do.
Laying 430 lineal ft. of Pipe Sewer	do.	do.	do.
Drainage, Kerbing, and Paving, Woodford Green	do.	do.	do.
Supply, etc., of Stones	Aylsham Guardians	H. J. Gidney, Clerk, Aylsham, Norfolk	do.
Stores	Cardiff Corporation	W. Harpur, Borough Engineer, Town Hall, Cardiff	do.
Portland Cement	do.	do.	do.
Erection, etc., of Market Stalls	Kingston-upon-Thames Corporation	H. A. Winsor, Town Clerk, Kingston-upon-Thames	Feb. 23
Shedding, etc., Halesworth	Spilsby R.D.C.	G. B. Walker, Clerk, Spilsby	do.
Galvanised Wrought-iron Piping and Fittings	Suffolk Agricultural Association	Secretaries, 6, Butcher-market, Ipswich	do.
Homes, Madonsley-road, Consett	Crown Agents for Colonies	Crown Agents, Whitehall-gardens, S.W.	do.
Homes, George-street, Consett	Mr. J. Hull	T. H. Murray, Architect, Front-street, Consett	do.
Twelve Automatic Rotary Distributors at S.W. G. Wks.	Mr. W. Aynaley	do.	do.
Dwelling-houses at the Butts, Parton, Wilt.	Darwen Corporation	R. W. Smith-Saville, Borough Engineer, Town Hall, Darwen	do.
Additions to Schools at Logie, Dumro, and Fetherneat	Mr. A. C. Musell	W. Drew & Sons, Architects & Surveyors, 23, Regent-circus, Swindon	do.
Materials	Ashton-under-Lyne Corporation	R. G. Wilson, Architect, 181A, Union-street, Aberdeen	do.
Sewer works, Campbelltown	Town Council	J. Fullerton, Burgh Surveyor, Campbelltown	do.
Two Semi-detached Houses, Bransby W.	St. Germans R.D.C.	J. S. Moffat, Architect, 25, Church-street, Whitehaven	do.
Sewer, St. Stephen's-by-Saltash	Royal London Friendly Society	F. E. Cleverton, 4, Buckland-terrace, Plymouth	do.
Stone-fronted Building at Southampton-row, W.C.	Brixworth R.D.C.	Corderoy, Selby, & Corderoy, Surveyors, Westminster, S.W.	Feb. 23
Granite	do.	W. C. Woodford, Clerk, 18, Market-square, Northampton	do.
Hauling Materials	Twickenham U.D.C.	Mr. Wykes, 5, Elvinstown-terrace, Northampton	do.
Fire Alarms	Nottinghamshire C.C.	F. W. Pearce, Surveyor, Town Hall, Twickenham	do.
Granite and Slag	do.	E. P. Hooley, Shire Hall, Nottingham	do.
Team Labour	Grantham R.D.C.	A. H. Mallin, Clerk, Grantham	do.
Materials	Gateshead Corporation	N. P. Pattinson, Borough Surveyor, Town Hall, Gateshead	do.
Street Paving	Islington Borough Council	Town Hall, Upper-street, N.	do.
Electrical and Engineers' Stores	Greenwich Guardians	D. M'Call, 25, Cochran-street, Glasgow	do.
350 tons of Gurnsey Granite Spalls	Glasgow Corporation	Glasgow Engineer, Town Hall, Rotherham	Feb. 24
Extension of Workshops, Charles-street, St. Rollox	Rotherham Gas Committee	W. H. Brerley, County Architect, 13, Lendal, York	do.
Incandescent Mantles	North Riding C.C.	J. F. C. Snel, Borough Electrical Engineer, Town Hall, Sunderland	do.
Fore-csts, Bds., & P'pings, Northallerton County Hall	Stafford Corporation	J. Childs, Bridgelands, Fernhurst, near Haslemere	do.
Four 250-kw. Synchronous 3-phase Motor Generators	Mr. A. G. Burton	W. Blackshaw, Borough Engineer, Borough Hall, Stafford	do.
Additions, etc., to "Overmoors," Fernhurst	Leadbury R.D.C.	R. G. Gurney, Surveyor, Leadbury	do.
Annual Supplies	Tadcaster R.D.C.	T. Scott, Surveyor, Aberford, near Leeds	do.
Haulage of Road Materials	do.	S. Dobell, Architect, Queen-street-chambers, Exeter	do.
Team Labour	Cork Corporation	do.	do.
Stone, etc.	Commissioners of H.M. Works, etc.	J. Wager, Office of Works, Stone's-gate, S.W.	Feb. 24
450 lineal yds. of Roadway (Kerbing, etc.), Teignmouth	Lord Stanley of Alderley	T. Foster, Engineer, 23, Tower-buildings, Liverpool	do.
Bridge, Winterbourne Building Estate, Teignmouth	Rev. J. L. Croft	E. A. Johnson, F.R.I.B.A., Abergavenny	do.
800 lin. yds. of sewers, Winterbourne Bg. Est. Teignm'th	Levenshulme U.D.C.	Johnstone Bros., Architects, 39, Lower-street, Carlisle	do.
Sixty Three-roomed Houses, Gurnanabrah Site	West Riding Asylums Committee	F. U. Jones, Surveyor, 24, Tricoll-dale, Stockport	do.
Twenty-nine Two-roomed Hses, Gurnanabrah Site	Liandaf and Dinas Powis R.D.C.	R. M. Evans, Surveyor, District Council Offices, Penarth	do.
New Sorting Office, Shepherd's Bush, W.	Glamorgan C.C.	F. P. Cook, Surveyor, Leasing-chambers, Mansfield	do.
Village at Gwn, Mon.	Glasgow Corporation	F. W. Brooke, Clerk, Council Offices, Heaton Moor	do.
Extension to Cotton Mill, Port-street, Annan	The Trustees	W. A. Currie, Secretary, Harbour Office, Belfast	Feb. 25
Materials and Stores	Bury & District Joint Water Board	G. Hollings, Borough Surveyor, Corporation Offices, Wallasey	do.
Surveyor's Materials	do.	F. Spencer Yates, Surveyor, Town Hall, Waterloo, Liverpool	do.
Stores	Dr. A. Shaw, J.P.	Surveyor, 25, Valentine-road, King's Heath	do.
Materials for Roads and Haulage (Four Divisions)	Chestnut U.D.C.	H. T. Wakelam, County Engineer, Gloucester Guildhall, Westminster	do.
Tools and Ironmongers' Goods	Governors St. Bartholomew's Hosp'l	do.	do.
Tenements, Cumberland-road, Kilkenny	Bury & District Joint Hospital Bd.	do.	do.
Buildings at St. Kieran's College, Kilkenny	Widnes Education Committee	do.	do.
Road-installing and Gravel	Penarth U.D.C.	do.	do.
Sluice Valves, Air Valves, etc., Ogden Reservoir	Mansfield Woodhouse U.D.C.	do.	do.
Valves, etc., Scout Moor Reservoir	Heak n Norris U.D.C.	do.	do.
Pipe Line from Gln Hall Reservoir	Belfast Harbour Commissioners	do.	do.
Residence, Watling Hill, St. Austell	Wallasey Corporation	do.	do.
Materials, etc.	Waterloo-with-Seaford U.D.C.	do.	do.
Rebuilding Premises in Cheap-street, Newbury	King's Norton and Northfield U.D.C.	do.	do.
Hospital, Ainsworth, Lancs.	Middlesex C.C.	do.	do.
Enlargement of St. Ann's Cross Council School	do.	do.	do.
Street Improvement Works	do.	do.	do.
Making-up Park-street	do.	do.	do.
Materials and Stores	do.	do.	do.
Railway Wagon Weighbridge, White-street	do.	do.	do.
Scavenging	do.	do.	do.
Fire Station, Town Hall-yard, Waterloo	do.	do.	do.
Supplies and Stores	do.	do.	do.
Granite, etc.	do.	do.	do.
Cartage of Material	do.	do.	do.

ST. ALBANS.—For alterations to police station, Town-road, for the Standing Joint Committee of Quarter Sessions and the County Council. Mr. Urban A. Smith, County Surveyor, Hatfield:—
 J. Root £788 5 J. T. Bushell £550 0
 Hammond & Son 606 0 H. J. Skelton 414 10
 Miskin & Son 589 0 D. Wilkins, Wat-
 ford* 360 0
 P. H. Pearce 578 0
 C. F. & L. Tennant 559 0

SHOEBURYNES.—For making-up of Priars street, part of Shoebury-avenue, and Wallace-street, for the Urban District Council. Mr. H. Harris, surveyor, Clarence-chambers, Southend-on-Sea:—
 H. Amstead £223 7 6 W. Hys £670 0 0
 J. Ventres 698 15 8 A. J. Harris,
 Buxton & Jen-
 nor 608 7 0 Shoeburness* 628 18 0

SLOUGH.—For making-up Stoke-gardens, for the Urban District Council. Mr. W. W. Cooper, Surveyor:—
 Porter & Co. £553 6 9 Free & Sons £432 12 3
 Forbes & Co. 495 18 7 J. Smith 404 14 10
 G. Smith 478 18 0 L. A. Langley,
 J. H. R. At-
 kins 471 6 4 Hardy,
 Burfoot & Sons 489 5 8 Slough and
 J. Jackson 405 18 8 Leicester* 304 8 6

SLOUGH.—For laying 750 lineal yds. of 9-in. and 6-in. pipe sewers, for the Urban District Council. Mr. W. W. Cooper, Surveyor:—
 J. H. R. At-
 kins £495 4 4 Burfoot & Son 502 11 1
 Watson, Junr. 521 10 8 L. A. Langley,
 J. Jackson 423 17 11 Hardy,
 A. C. Soan 447 5 9 Johnson,
 Porter & Co. 430 0 0 Slough and
 Free & Sons 507 7 3 Leicester* 274 7 3

TAYNUILT (N.B.).—For new public hall, for the Public Hall Committee of Tainuilt, Argyllshire. Mr. O. Woulfe Brennan, architect, Oban. Quantities by architect:—

Masons and Bricklayers.
 D. & J. Mc
 Dougal £259 19 10 H. Macdougall 222 0 7
 J. Stevenson 254 0 0 J. Craig 220 11 0
 P. Grey 245 15 7 J. Rowan,
 D. & A. Minns 242 19 6 Appin* 214 15 0
 D. & W. Mc
 Nivell & Co. 238 18 2

Joiners.
 P. Grey £393 3 9 D. & J. Mc
 W. Menzies 357 6 5 Dougal 2324 2 0
 J. & A. Mc
 Dougal 342 12 10 D. & W. Mc
 D. & A. Minns 342 8 8 P. McNicol 233 17 4
 J. McLean 340 16 11 J. Rowan,
 J. McDougall 335 0 0 Appin* 229 10 0
 P. Wight 329 12 10 McColl & Gra-
 ham 283 9 11

Plumbers.
 Anderson &
 Nisbet £87 0 0 A. McArthur &
 D. Crawford 60 14 11 Son £50 12 9
 A. McDougall,
 Oban 57 14 0

Slaters.
 J. Reid £91 2 0 D. McG. Jamieson* £86 0 9

Plasterers.
 D. W. Callum £47 10 4 D. Pest, Port
 William* £43 3 3

Painters.
 A. Robertson, Oban* £25 6 9

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TWICKENHAM.—For erecting pumping station, boiler house, destructor house, chimney shaft, work-
 shops, etc., at Sewage Disposal Works, the Mareway,
 for the Urban District Council. Mr. W. Fairley,
 engineer, 69, Victoria-street, Westminster, S.W. Mr.
 F. W. Pearce, Surveyor, Town Hall, Twickenham:—

Johnson & Son	£13,374	1,688
Lamplough	12,500	237
Mowlem & Co.	14,321	415
Scots & Son	12,440	275
Watson	11,959	735
Cowley & Drake	11,285	340
Cheeseman & Sons	12,440	349
Renshaw	11,337	300
J. W. Brooking	18,900	104
Thomas & Fearon	14,387	350
Perry & Co.	12,420	245
Kirk & Randall	11,977	298
Kemmidge & Shore	11,347	284
Gibson	10,590	450
Foster Bros.	12,508	650
Kingerlee & Sons	11,095	227
Ferguson & Co.	14,850	330
Haycock & Co.	9,980	294
Thomas & Edge	12,748	350
Lawrence & Son	11,988	586
Willocks & Co.	11,095	302
Chambers Bros.	12,494	700
Hudson & Co.	12,748	515
Davey, Ltd.	11,387	387
W. Wallace	11,700	158
Page & Sons	10,649	400
Nightingale	12,449	265
Pethick	12,813	158
Minter	11,565	250
Wall	10,962	250
Johnson & Co.	11,200	250
Wisdom	10,475	330
Winney & Co.	11,159	370
Speedley & Smith	12,950	240
Wilkinson Bros.	11,988	183
Potterton	12,240	480
Kingorlet	11,995	650
Ferguson & Co.	15,950	

† Amended tenders.

WATFORD.—For an extension of the cemetery, etc., for the Burial Board. Mr. C. P. Ayres, surveyor, Watford:—

W. Judge	£380	Bracey & Clark,
S. Swain	305	Watford* £297
H. Brown	800	G. Pickin 192

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CONTRACTS.—Continued.

Nature of Work or Materials.	By whom advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered
Deptford Borough Council	Deptford Borough Council	Municipal Offices, 20, Tanner's-hill, Deptford	Feb. 28
Steyning West R.D.C.	Steyning West R.D.C.	E. Cripps, Council Offices, New Shoreham, Sussex	do.
Ilford U.D.C.	Ilford U.D.C.	H. Shaw, Engineer, Town Hall, Ilford	do.
Town Council	Town Council	R. Dixon, Borough Surveyor, Municipal Offices, Stratford-on-Avon	do.
Park Iron Ore and Coal Co., Ltd.	Park Iron Ore and Coal Co., Ltd.	W. F. Butler, Engineer, Old Bank-buildings, Chester	do.
West Ham Borough Council	West Ham Borough Council	Thoms & Wilkie, Architects, 48, Reform-st., Dundee	do.
do.	do.	A. O. Evans, Williams & Evans, Architects, Fountains	do.
do.	do.	Borough Engineer, Town Hall, West Ham, E.	do.
do.	do.	do.	do.
do.	do.	do.	do.
Balling Town Council	Balling Town Council	Borough Engineer, Town Hall, Baling, W.	do.
Willenden District Council	Willenden District Council	Council's Engineer, Dyne-road, Kilburn, N.W.	do.
Southwark Borough Council	Southwark Borough Council	Borough Engineer, Town Hall, Walworth-road, S.E.	Mar. 1
Steyning West R.D.C.	Steyning West R.D.C.	E. Cripps, Council Offices, New Shoreham, Sussex	do.
Littlehampton U.D.C.	Littlehampton U.D.C.	H. Howard, Surveyor, Town Offices, Littlehampton	do.
Stoke-upon-Trent Corporation	Stoke-upon-Trent Corporation	A. Burton, Borough Surveyor, Town Hall, Stoke-upon-Trent	do.
Northampton R.D.C.	Northampton R.D.C.	W. Tomalin, 14, Guildhall-road, Northampton	do.
do.	do.	District Surveyor, 14, Guildhall-road, Northampton	do.
do.	do.	P. M. Doyle, 76, Quay, Waterford	do.
Manadoff and Dinas Powis R.D.C.	Manadoff and Dinas Powis R.D.C.	M. Warren, Park House, 20, Park-place, Cardiff	do.
York Corporation	York Corporation	A. Creer, Engineer, Guildhall, York	do.
Chester Corporation	Chester Corporation	Electrical Engineer, New Crane-street, Chester	do.
Wetherby R.D.C.	Wetherby R.D.C.	W. Swindell, Surveyor, Imperial-chambers, Albert-street, Derby	do.
Fulham Borough Council	Fulham Borough Council	E. H. Coates, Clerk, Wetherby	do.
Paddington Guardians	Paddington Guardians	Borough Surveyor, Town Hall, Fulham, S.W.	do.
Wood Green U.D.C.	Wood Green U.D.C.	E. Bowley Sim, Architect, 3, Craig's-court, Charing Cross, W.C.	do.
Horsey Town Council	Horsey Town Council	Council's Surveyor, Town Hall, Wood Green, N.	do.
Llanybythar R.D.C.	Llanybythar R.D.C.	Borough Engineer, 99, Southwood-lane, Highgate, N.	do.
Rawtenstall Corporation	Rawtenstall Corporation	J. E. Lloyd, Clerk, 28, High-street, Lancaster	Mar. 2
Fontefract R.D.C.	Fontefract R.D.C.	J. Johnson, Borough Surveyor, Municipal Offices, Rawtenstall	Mar. 3
Wimbledon U.D.C.	Wimbledon U.D.C.	J. Waugh, C.E., Sunbridge-chambers, Bradford	do.
Colchester U.D.C.	Colchester U.D.C.	Electrical Engineer, Durnsford-road, Wimbledon	Mar. 4
do.	do.	H. Goodyear, Borough Engineer, Town Hall, Colchester	do.
Steyning East R.D.C.	Steyning East R.D.C.	do.	do.
Flintshire Education Committee	Flintshire Education Committee	E. Cripps, Council Offices, New Shoreham, Sussex	Mar. 6
Walsall Education Committee	Walsall Education Committee	S. Evans, County Surveyor, County-buildings, Mold	do.
Sutton District Water Co.	Sutton District Water Co.	Railley & McConnell, Architects, Bridge-street, Walsall	do.
Brighouse Corporation	Brighouse Corporation	W. V. Graham, Engineer, 5, Queen Anne's-gate, Westminster	do.
Bath Corporation	Bath Corporation	S. S. Haywood, Borough Engineer, Municipal Offices, Brighouse	Mar. 7
Beaumaris Town Council	Beaumaris Town Council	C. R. Fortune, City Surveyor, Bath	do.
Bingham R.D.C.	Bingham R.D.C.	Borough Surveyor, Raglan-street, Beaumaris	Mar. 8
Basingstoke Corporation	Basingstoke Corporation	R. H. Beaumont, Clerk, Market-place, Bingham	do.
do.	do.	F. R. Phipps, Borough Surveyor, Town Hall, Basingstoke	do.
Brighouse Corporation	Brighouse Corporation	do.	do.
do.	do.	S. S. Haywood, Borough Engineer, Municipal Offices, Brighouse	Mar. 11
Tadcaster R.D.C.	Tadcaster R.D.C.	do.	do.
Great Western Railway Co.	Great Western Railway Co.	T. Scott, Surveyor, Aberford, near Leeds	do.
Brighouse Corporation	Brighouse Corporation	Estates Office, Carlisle, Ferranaworthall	do.
West Lancashire R.D.C.	West Lancashire R.D.C.	Kennedy & Jones, Engineers, 17, Victoria-street, S.W.	Mar. 13
Cheltenham Corporation	Cheltenham Corporation	W. D. Morgan, Architects-chambers, Pentre, Rhondda Valley	Mar. 14
South Shields Town Council	South Shields Town Council	W. J. Jennings, Architect, 4, St. Margaret's-street, Canterbury	do.
Western Valleys (Mon.) Sewerage Bd.	Western Valleys (Mon.) Sewerage Bd.	Town Hall, Fulham, S.W.	Mar. 15
do.	do.	C. Law-Green, Surveyor, Wigan-road, Ormskirk	do.
do.	do.	do.	do.
Brighton Marine Palace & Pier Co.	Brighton Marine Palace & Pier Co.	J. S. Pickering, Borough Surveyor, Municipal Offices, Cheltenham	Mar. 17
do.	do.	Central Hall, Chapter-row, South Shields	Mar. 18
Nwct-T., Broch. of Prev. of Con.Assoc.	Nwct-T., Broch. of Prev. of Con.Assoc.	B. Latham, C.E., Parliament-mansions, Victoria-st., Westminster	April 8
do.	do.	do.	do.
do.	do.	do.	do.
do.	do.	F. W. Francis, Secretary, Palace Pier, Brighton	No date.
do.	do.	Elders' Navigation Collieries, Ltd., Merchants' Exchange, Cardiff	do.
do.	do.	do.	do.
do.	do.	Wind-on Steam Coal Co., Ltd., 3, Butte-crescent, Cardiff	do.
do.	do.	Nicholson & Dotehul, Archts., Clayton-chbrs., Newcastle-on-Tyne	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Assistant Surveyors	Admiralty	150L per annum	No date.

Those marked with an (*) are advertised in this number. Competitions, iv. Contract, iv. vl. viii. x. Public Appointments, xviii.

TENDERS.—Continued from page 191.

LONDON.—For reinstatement after fire, and alterations and additions to Royal Artillery Theatre, and to new structure. Mr. W. G. & R. Sprague, Architects, Cannon-chambers, 10 and 11, Jernyn-street, S.W. Enquiries by Mr. A. R. Henderson, surveyor, C. Rd. Hall, S.W.

Patons & Forster
G. Langley & Son, £8,500
H. Lewis & Son, 8,300
G. C. Hill, 8,000
W. H. Lorden & Son, 7,189
F. J. G. W. 7,078

LONDON.—For reinstatement at Nos. 1, 2, 3, and 4, Brompton-square, Camden Town. Messrs. C. Sparrow & Co. Enquiries by Mr. E. H. Dove, £324
G. O. W. 330
Grover & Son, 324

NEWTON.—For alterations and additions to the Green Dragon Hotel, Newton, for the Carlisle New Brewery Co., Ltd. Mr. H. Higginson, architect, 3, Lancaster-street, Carlisle. Quantities by architect:—
Builder: W. H. Reeves
Plumber: T. B. Hetherington
Slater: F. T. Kellous
Painter: S. Ferguson & Sons
Painter, etc.: W. Sloan
[All of Carlisle.]

PENCOED.—For the construction of a new road and drain at Penpleck, for the Wimbourn Estate. Mr. J. L. Lambert, Surveyor, Prudential-buildings, Briggden. Quantities by Surveyor:—
E. Davey 5810 0
J. Williams 571 10
T. Davies & Co. 495 15
W. Jenkins 483 0 0

RICHMOND.—For the rebuilding of the Black Horse P.H., Richmond, Surrey. Mr. Herbert Riches, architect, 8, Crooked-lane, King William-street, London, E.C. Quantities supplied:—
W. R. Williams £4,275
Adams & Son 4,275
Sheffield Bros. 4,242
Tedd & Newman 4,000

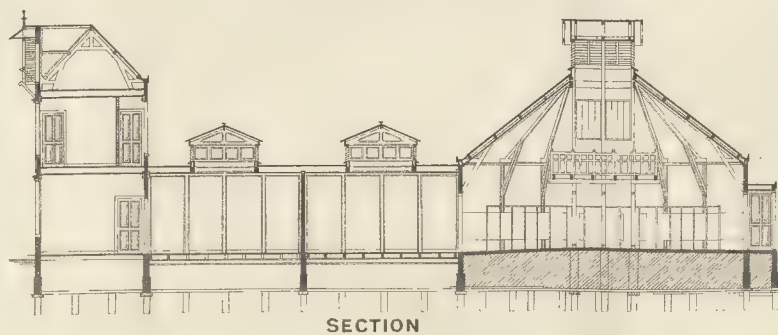
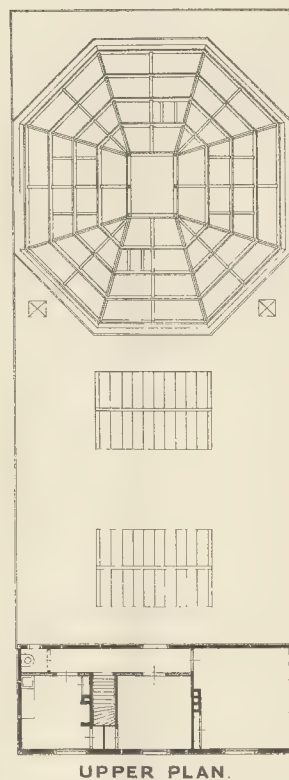
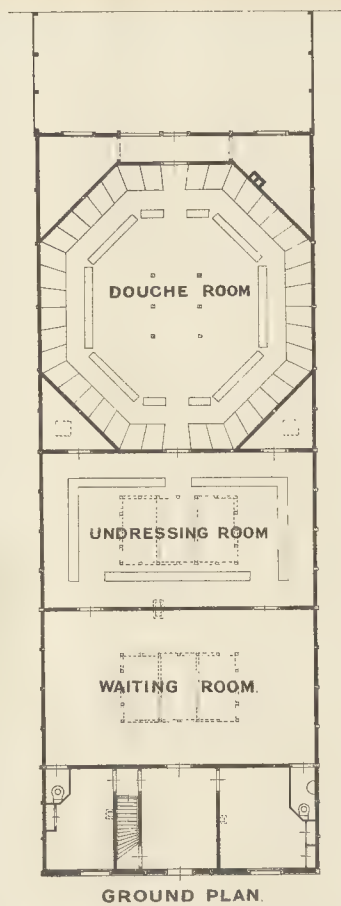
ROYSTON.—For sewage disposal works, for the Urban District Council. Mr. T. W. Wits, Surveyor, Scilles & Robins, £21,550
W. H. Hickins 1,381

SEDGEFIELD.—For erecting two iron verandahs to cottage blocks at Durham County Asylum, for the Visiting Committee. Mr. W. Crozier, County Architect, Shine Hall, Durham:—
Scheme I. Scheme II.
M. R. Draper & Sons 2560 0
G. T. Maunders 449 0
W. C. Atkinson & Son 422 7
Sloan & Davidson 384 15
J. Laidler & Sons, Durham 335 0

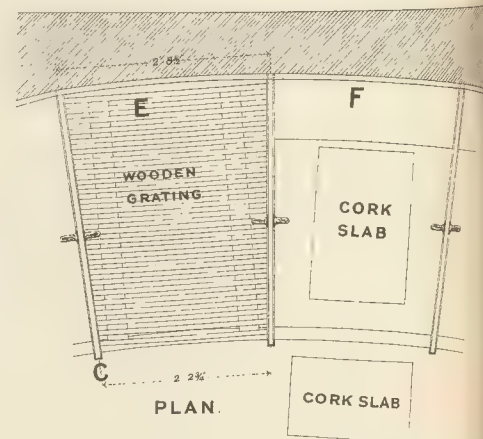
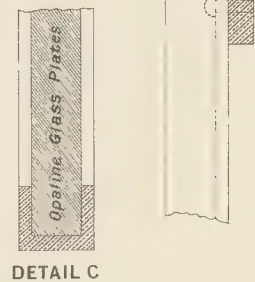
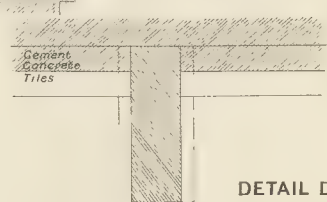
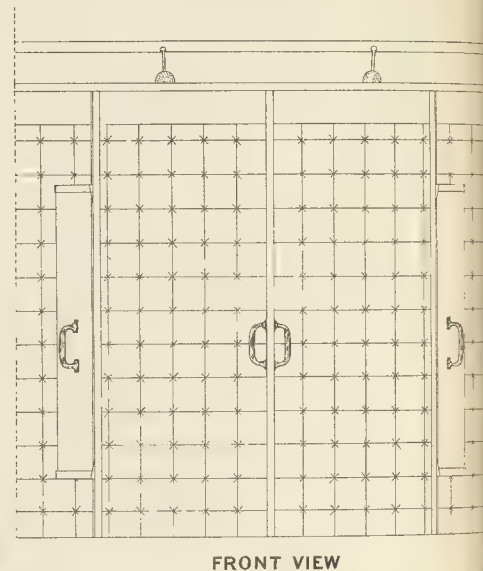
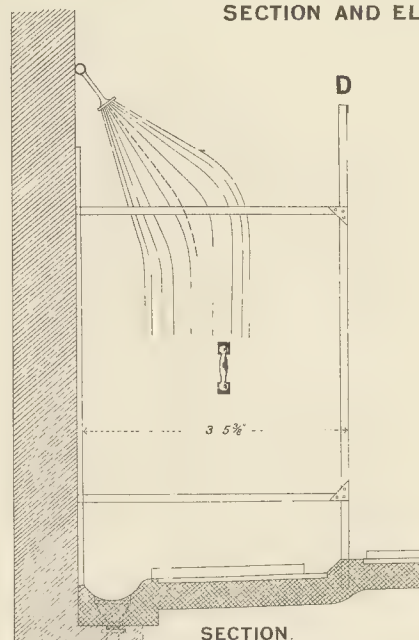
SAUGHALL MASSIE (Cheshire).—For constructing Griffiths-road, for the Wirral Rural District Council. Mr. Thomas Davies, Surveyor, 33, Kingland-road, Birkenhead:—
P. Hayes £489 2 0
S. Hutton 482 3 4
Maddocks & Co. 465 0 0
J. McGeoch 400 0 0
Borris & Thompson 380 0 3
J. Price 313 0 0

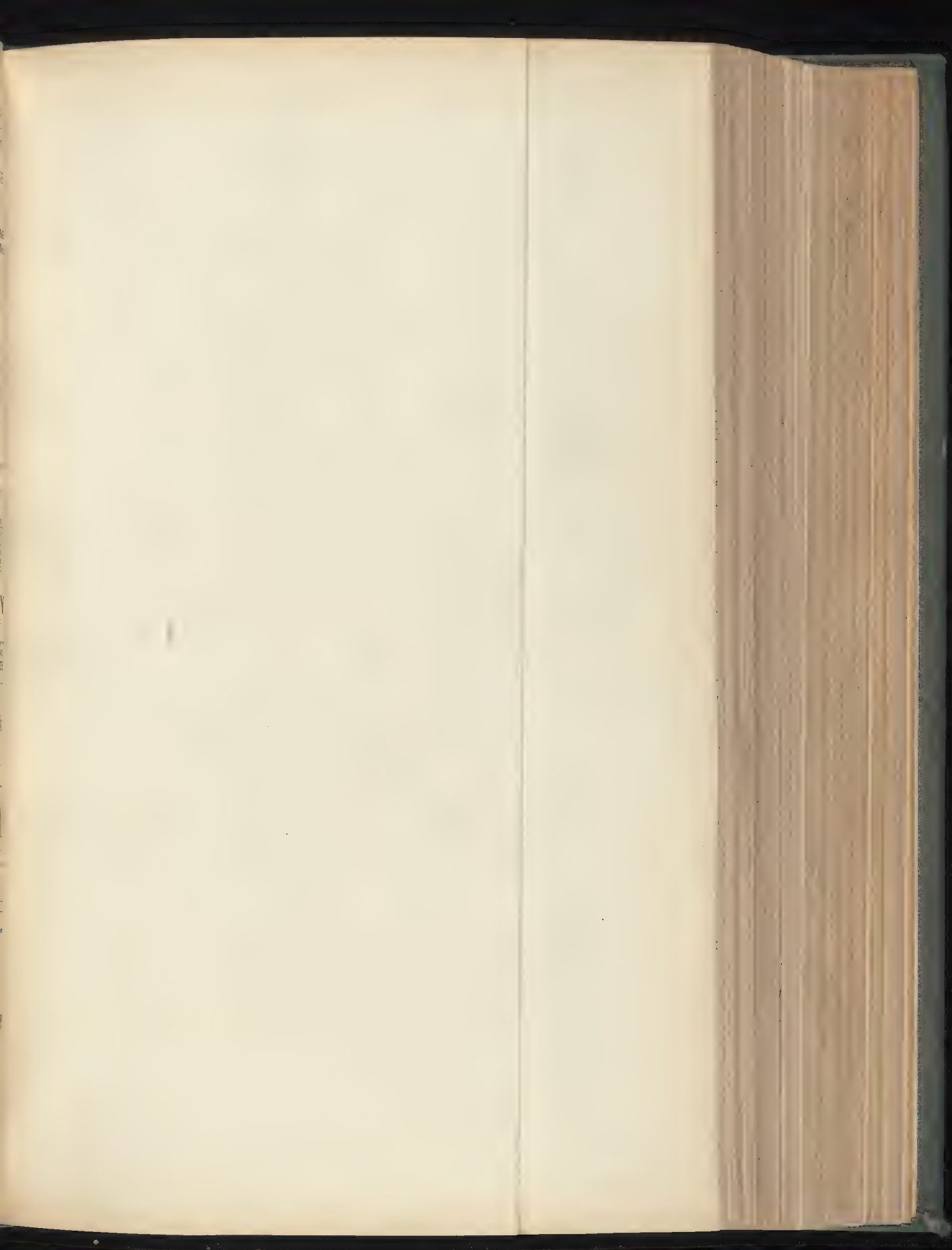
SHEFFIELD.—For extensions and alterations to the Blind Institution, West-street. Mr. E. Winder, architect, Corn Exchange-chambers, Sheffield:—
Gray & Son £5,865
J. Pidler, Ltd. 5,820
Hughes 5,777
A. Moore 5,700
H. Winter 5,575
Pinder, Bro., & Bone 5,445
Powell & Son 5,300
K. Bates 5,300
Wilson & Richardson 5,177
Longden & Son, Ltd. 5,123
C. H. Gilliam 5,001
Dawson, Jones, & Co. 4,999

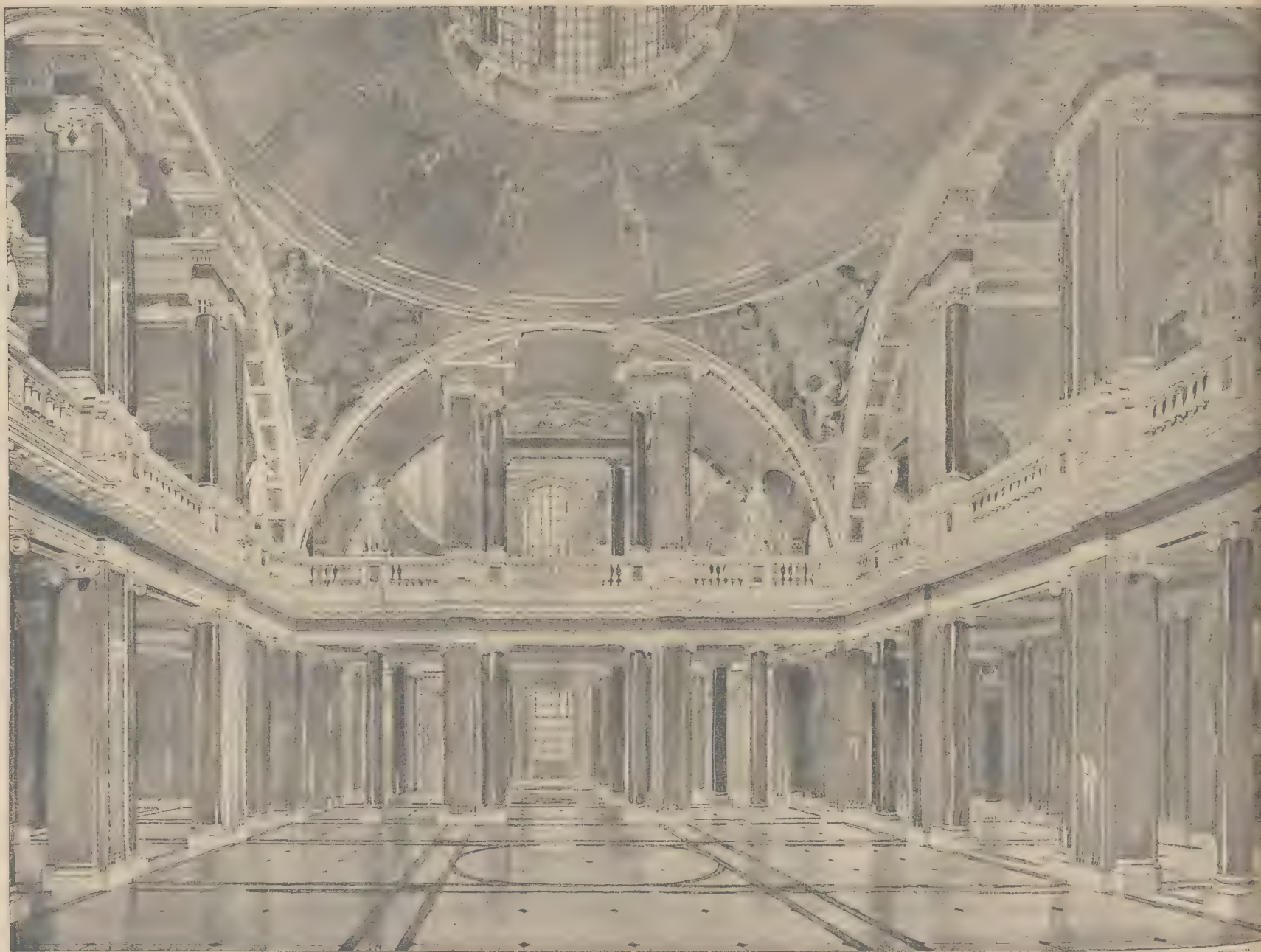
A. Harris £304 0 0
A. Vaughan 300 0 0
E. A. Mitchell 280 0 0
C. L. Warren 274 0 0
R. Hughes, Brim-stage 247 0 0
E. & W. Oxley £4,998 0
J. Eschley & Son 4,908 0
J. & H. Whelan 4,905 0
J. Masson 4,913 10
B. A. d'ager 4,910 0
Applby 4,902 0
H. Wadsworth 4,880 0
A. Bradbury 4,812 0
D. O'Neil 4,812 0
S. Bower-road 4,610 0



SECTION AND ELEVATION OF DOUCHE BATH CUBICLES.



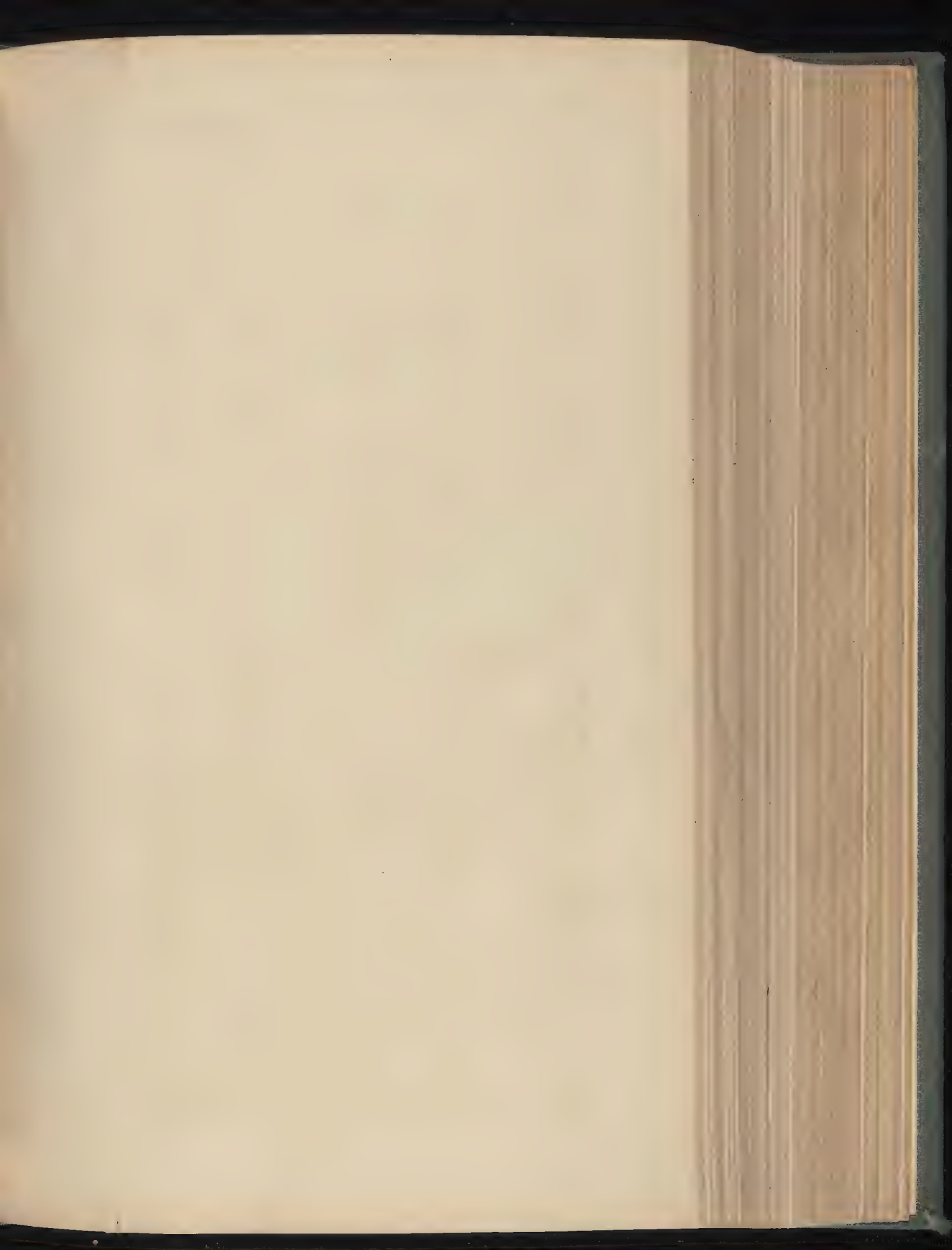




Title Prize, R.I.B.A., 1905.

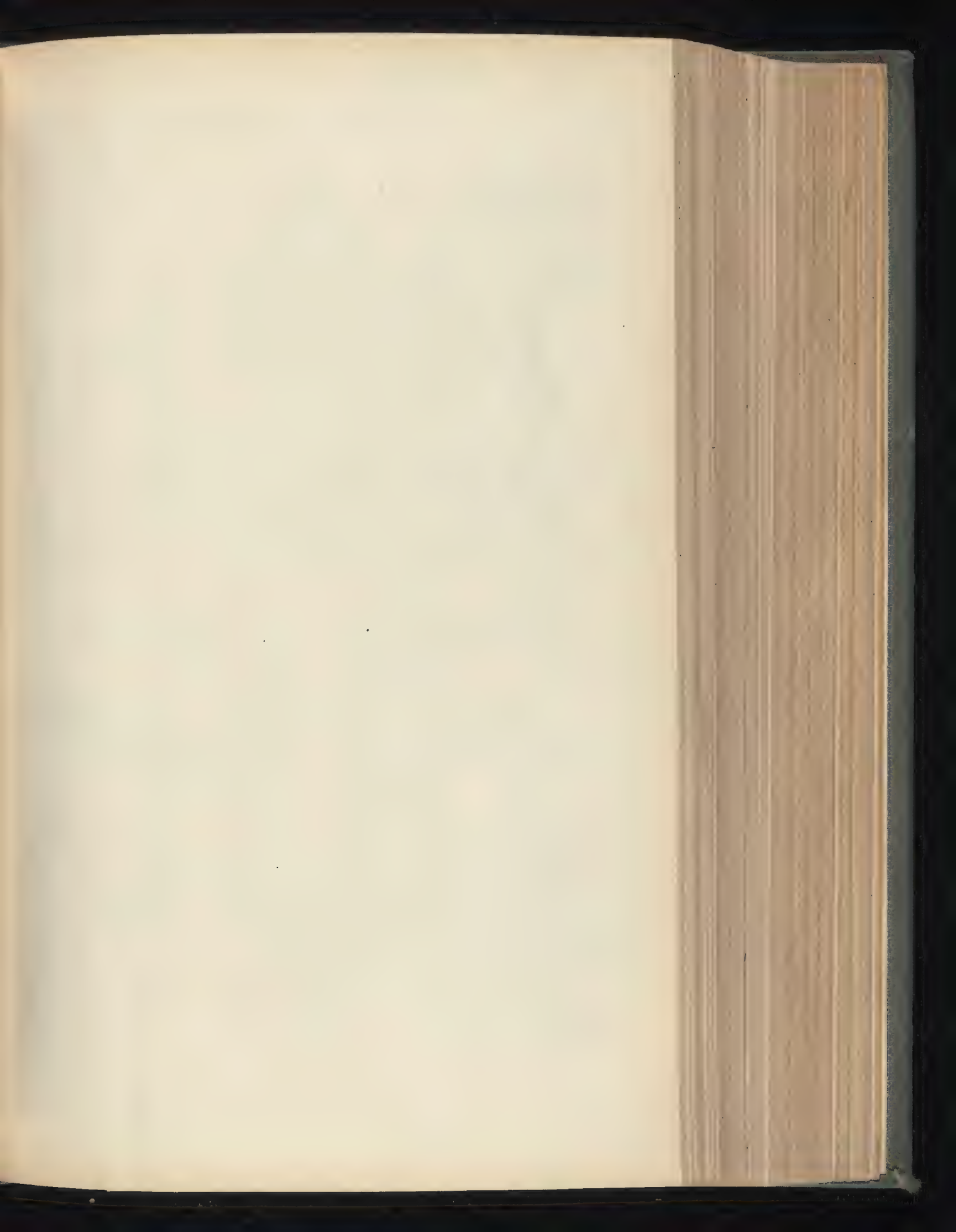
DESIGN FOR A LOUNGE AND STAIRCASE IN A LARGE HOTEL.—By MR. R. ATKINSON

PERSPECTIVE VIEW.

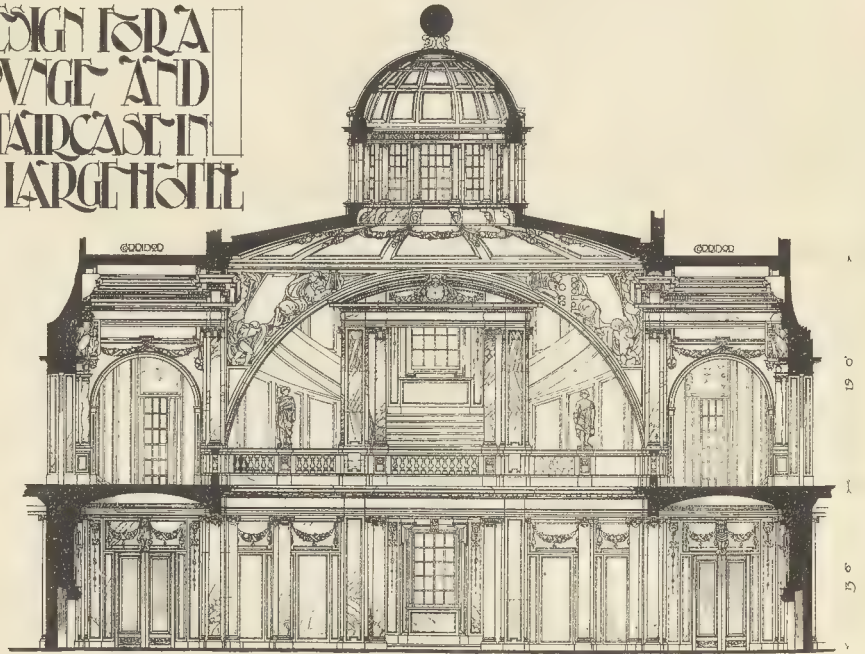


THE BUILDER, FEBRUARY 18, 1905.



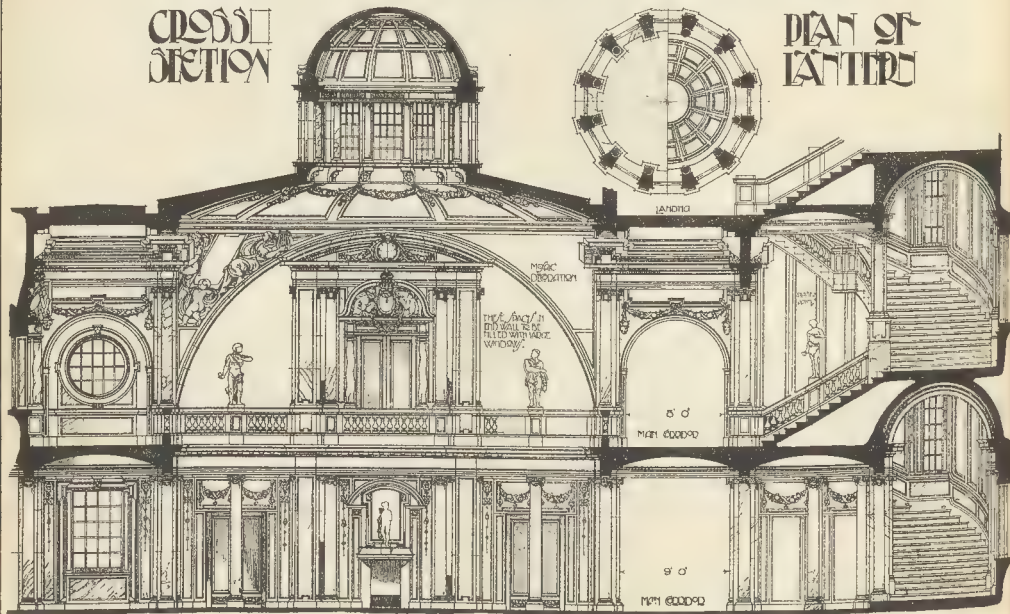


DESIGN FOR A LOUNGE AND STAIRCASE IN A LARGE HOTEL



CROSS
SECTION

PLAN OF
LANTERN



LONGITUDINAL
SECTION

SCALE

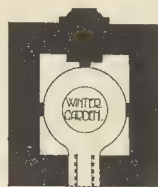
0 10 20 30 40 50 60 70 80 90 100 FEET

"PALLADIO"

PHOTO-LITHO. SPRAGUE & CO. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

DESIGN FOR A LOUNGE AND STAIRCASE IN A LARGE HOTEL.—By MR. R. ATKINSON.

DESIGN FOR A LOUNGE AND STAIRCASE IN A LARGE HOTEL.



SKETCH PLAN
OF HOTEL

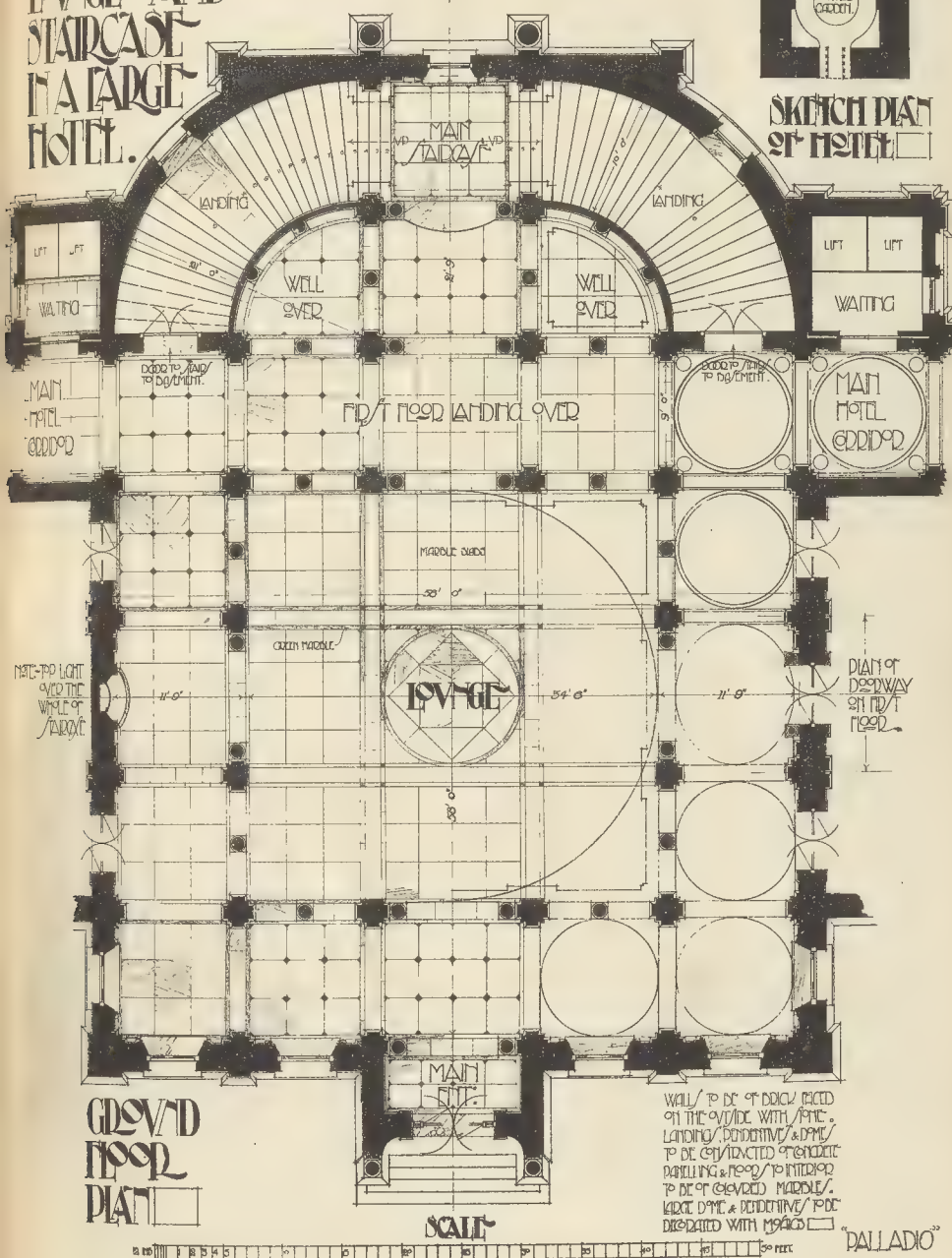
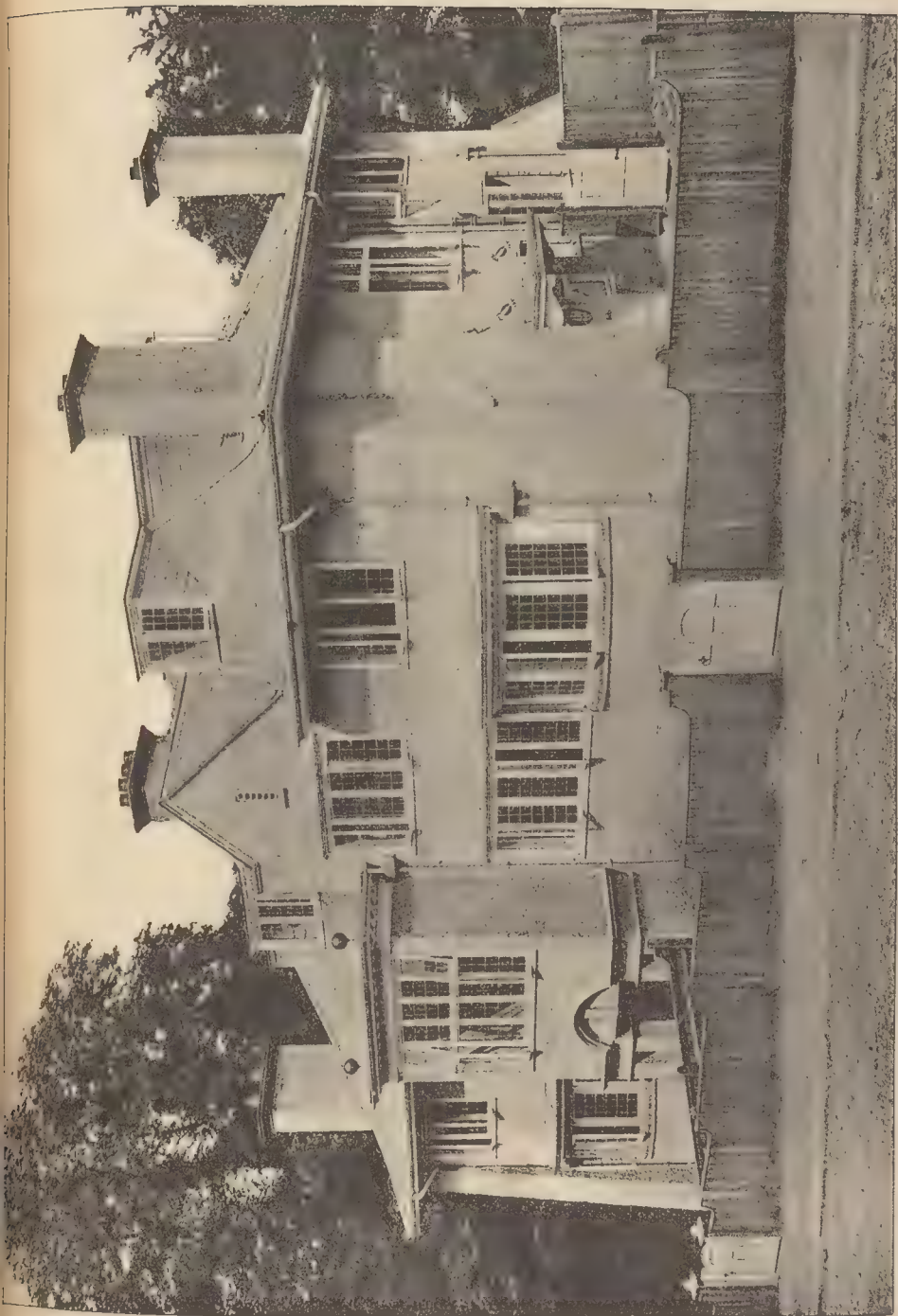


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DESIGN FOR A LOUNGE AND STAIRCASE IN A LARGE HOTEL.—By MR. R. ATKINSON.



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The Builder.

VOL. LXXXVIII.—No. 3235.

FEBRUARY 2 1905.

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End of the Tiberine Island, showing prow form	From an Engraving by Piranesi.
Design for a Winter Garden	By Mr. J. A. M. Hunter.
1. Perspective View.	
2. Constructional Details.	
Church of St. James, Ealing	Mr. W. Pywell, A.R.I.B.A., Architect.
New Insurance Offices, Norwich	Messrs. G. J. & F. W. Skipper, Architects.

Illustrations in Text.

Restored Plan of the Tiberine Island, as given by Piranesi	Page 195	Norwich and London Accident Insurance Offices. First Floor Plan	Page 209
Part of the Ancient Masonry at the End of the Island of the Tiber: from a Photograph	Page 196	Ditto, Ground Plan	Page 210
Church of St. James, Ealing. Plan	Page 209	Illustrations to Student's Column	Page 214

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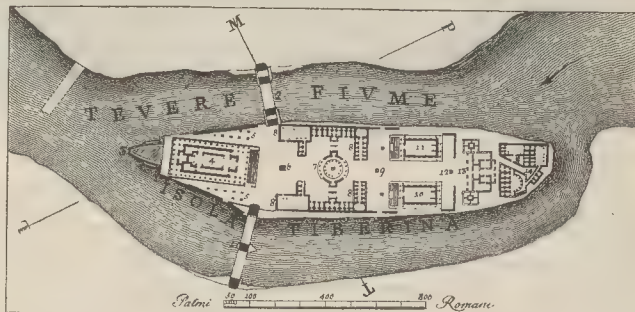
The Island of the Tiber.



HE island of the Tiber, though it can hardly be said to have the same historical importance as the more famous quarters of Rome, is nevertheless a spot of considerable interest, and must have been, until the last twenty years, remarkable for its picturesqueness, which even now it has not altogether lost.

Though mentioned in all the books which deal with Rome in general, it has never, until recently, formed the subject of a separate volume. But the want has now been supplied by M. Besnier, who, in his work "L'Île Tibérine dans l'Antiquité" (Paris, 1902), which appears as fascicule 87 in the "Bibliothèque des Écoles françaises d'Athènes et de Rome," treats of the subject so carefully and exhaustively that it will be some time before his admirable monograph is likely to be superseded.

The first of the four books into which it is divided deals with the history of the island in antiquity. According to the usual tradition, it took its origin from the crop of corn reaped from the Ager Tarquiniorum (thenceforth the Campus Martius) which, after the expulsion of Tarquinius Superbus, was thrown into the Tiber, religious scruples forbidding its use for food. Other legends either trace the origin of the island to the crop of corn from a field given to the Roman



Restored Plan of the Tiberine Island, as given by Piranesi.

people by Tarquinia, a Vestal virgin, some time after the kings had ceased to reign in Rome, or presuppose its existence at the time of Tarquinius Superbus, who is said to have been killed on the island. This last story, however, disagrees with all other accounts of the death of the last king of Rome,* and is only important as a further testimony to the connexion of the name of the family with the origin of the island of the Tiber.

This name, however, is simply that of the divine pair, Tarquinius and Tarquinia (or Tarpeius and Tarpeia), who were in primitive times worshipped on the Capitol, and to whom it owes its earliest appellation, *Mons Tarpeius*, and the name would easily extend itself to the plain at the foot of the hill. As to the origin of the island, there is, according to M. Besnier, this amount of truth in the

* Our classical authorities are otherwise unanimous in placing his death several years after his departure from Rome.

legend—that the island, though, no doubt, it has a more solid nucleus, was nevertheless in times past (and is still) subject to considerable changes in conformation, especially after floods, and that it formed no part of the city proper until after the date to which the expulsion of the kings is assigned (509 B.C.).

We hear nothing of its history during the next two centuries, but in 293 B.C. the plague raged in Rome, and after two years an embassy was sent to the shrine of Æsculapius at Epidaurus to demand the help of the god of healing. The legend tells us that, in response to the prayers of the Roman envoys, the sacred serpent, which was the incarnation of the divinity, returned in their ship with them to Rome and left it at the island, whereupon a temple in the honour of the god of medicine was erected there. The real reason, however, for the collocation was that the new worship was of



Part of the Ancient Masonry at the end of the Island of the Tiber: from a Photograph.

Greek origin, and its seat was, therefore, in accordance with Roman ideas at that period, placed outside the limits of the city proper.

The temple was apparently the first building of any size to be erected upon the island; a few other cults of less importance were established there later on. The plan on last page is the restoration given by Piranesi ("Le Antichità Romane" vol. iv.), which is probably purely conjectural, except in regard to the position of the temple of Æsculapius (4), concerning which there is little doubt. At some uncertain period the island was—no doubt, in allusion to the legend mentioned above—provided with embankment walls disposed in such a manner as to give it the form of a ship. Of these the only portion which now remains is a fragment of walling of large blocks of stone upon the north-east side of the island, upon which a bust of Æsculapius, with the serpent coiled round a staff, may still be seen. This is shown in the plate reproduced from Piranesi in the present issue. The reproduction from a photograph given on this page shows it from another point of view at a recent period. This photograph was taken under the direction of Dr. Charles (then residing in Rome), thirteen years ago, when the Tiber was unusually low, and he had the masonry cleared of sand for the purpose. As the excavation was not official, however, he was not permitted to proceed. The photograph, however, shows it very well, and corro-

borates the general accuracy of Piranesi's drawing. In the imperial period an obelisk was added to represent the mast of the vessel, fragments of which are now at Naples and at Munich. No other remains are at present visible *in situ* upon the island, but the site of the temple of Æsculapius is certainly marked by the church of S. Bartolommeo, which was dedicated by its original founder, the Emperor Otho III., to St. Adalbert of Prague, about 1000 A.D. Votive objects of terra-cotta, no doubt connected with the temple, were found upon the north bank of the Tiber in 1885-7.

At the same time as M. Besnier was writing his book, M. René Patouillard, whose help he acknowledges in his preface, was making an ideal restoration of the island in its ancient state, which is now in the library of the École des Beaux-Arts at Paris, but has not yet been published. M. Patouillard's drawings were exhibited in the architectural gallery at the last Paris Salon, when we commented on them at some length in our article on the Salon. M. Patouillard takes the view that the whole island was treated as a galley and revêted with masonry giving it that form, but this, as Piranesi points out (see under head of "Illustrations") is very doubtful in view of the scale of the still existing remains of the masonry.

The island has recently been the subject of much discussion. The embankment works of the Tiber, which the great flood

of 1870 showed to be imperatively necessary (though it was inevitable that much of the picturesqueness of the river should disappear), were, unfortunately, undertaken, as it would seem, by engineers who had a positive aversion for the remains of antiquity, and were, further, incapable of profiting by its lessons.* They attempted to impose upon the river a uniform width of 100 metres, which is too great for the ordinary state of the river, while insufficient for exceptional floods. The Romans of old had arranged matters with far more skill. The Ponte S. Angelo, built by the Emperor Hadrian to serve as an approach to his great mausoleum, was, it was found in 1892, built to correspond with the various states of the river, three arches (giving a width of 66·50 metres) being provided for low water, two more for high water (with a total width of 97·50 metres), and three still smaller for exceptional floods (giving a total width of 135 metres). But the modern engineers preferred to reconstruct the bridge to the single width of the new bed. Reconstruction has also been the fate of the Pons Cestius, which spans the right arm of the Tiber at the island, and the channel was widened from 48 to 75 metres, the bridge spanning the left-hand branch (the Pons Fabricius, numbered

* Compare "Roman Drainage Works and River Regulation," in "Public Works," vol. II, No. 4, pp. 306-314; also an admirable article in the "Nouvelle Antiquaire" for February 1, 1902, by one of the best of modern Italian architects, the restorer of the splendid Castello at Milan (Luca Beltrami), *Per la sistemazione definitiva del Tevere urbano*.

"1" in Piranesi's plan) being, fortunately, left untouched. The reason for the change in the relative width of the two branches of the river is not easy to see, and, coupled with the faulty inclination to the stream of the piers of the new bridges immediately above and below the island, the Ponte Garibaldi and Ponte Palatino, it led, first of all, to the sitting up of the left arm of the river, and finally, in the great flood of December, 1900, to the fall of 125 metres of embankment on the right bank. But the spirit of destruction went still further; a ministerial commission appointed to report on the disaster suggested as a remedy the total suppression of the island by the formation of a bed 70 metres wide in the centre and the filling up (to a certain extent) of the lateral channels, so as to give a flood width of 214 metres.

This proposal fortunately met with the most vigorous opposition, and there is now no chance of its being carried out. The expedient of constructing a wall from the central pier of the Ponte Garibaldi to the point of the island, and of blocking the two (enlarged) lateral arches of the Pons Cestius except in times of flood, secures a sufficient flow of water in the left arm, for the present at any rate. But the damage once done is not easy to repair, and the island, though even now picturesque, has lost greatly in attractiveness since the construction of the embankment walls—in large measure inevitably, it is true, though, as we have tried to show, more of its ancient character might have been preserved.

THE WHISTLER EXHIBITION.

WE presume that there will be a general *fanfaronade* this week, in the quarters of art criticism, in regard to the memorial exhibition of Whistler's works which has been got together at the New Gallery. The cry is that way at present, and "Why drag in Velasquez?" is the prevailing sentiment. It is one of the characteristics of the artistic London of the present day that it must always have some special fancy, some particular shibboleth which is to distinguish the faithful from the Philistines. Whistler is one of the latest fashions, and any scrawl from his pencil is to be accepted and admired simply because it is his.

Not being, happily, liable to be carried away by these currents of public fancy, we can examine the exhibition at the New Gallery in a more sober spirit; and, without going into superlatives, can recognise that it is one of remarkable interest, in spite of the fact that a considerable proportion of its contents, numerically, might be described as mere studio litter—unfinished suggestions for figures or scenes. Some of the worst and most capricious of the artist's previously exhibited works are not included; for instance, we do not see the absurd ghost of an ill-drawn nude which was exhibited somewhere two or three years ago under the ambitious title "Phryne, Builder of Cities," and was lauded by hysterical critics. Nor, on the other hand, do we see any examples of Whistler's small life-studies of an earlier period, some of which were collected a good many years ago

in an exhibition in Bond-street, and which showed that he could and did, at that time, produce careful and well-drawn figure studies. Instead of these, we have a number of small rough scrawls of figures on scraps of paper, many of them most carelessly drawn, and which an artist more careful of a sound reputation would not have wished to exhibit or to sell at all, though they might have been useful as memoranda to himself. But Whistler had contrived to fool his public to that point that many of them would pay solid cash for any scribble from his hand. Occasionally we get a really pretty suggestion in one of these rough sketches, as in "The Convalescent" (48, South Room). In many of these figure sketches the feet are omitted, which saves a great deal of trouble. The makers of the catalogue show a certain consciousness of this in their comment on the pastel sketch catalogued as "Little Nude" (70, South Room), which, having all its limbs, they describe as "a very complete study of a girl." It is what most painters would call a very slight sketch, but it is "complete" no doubt in a relative sense and in comparison with the numerous examples which are nothing more than rough suggestions of figures.

Most of the few large oil-paintings are in the West Gallery. The well-known portraits of Carlyle and of the painter's mother (the latter specially lent from the Luxembourg by the French Government) hang opposite to each other; both very remarkable pictures, which will always retain their position as such. But it is rather curious to notice that both of them show the same very formal and conventional arrangement of the figure being seated exactly side-ways to the spectator, forming a kind of "side-elevation" in fact, and placed close against a wall. This may perhaps be taken as an exemplification of the opinion that Whistler expressed on more than one occasion, that a picture was a "pattern"; a theory that is true in a sense, though it may very easily be carried too far; but it may be added that this treatment of seated portraits escapes all the difficulties of foreshortening which occur in any other position. Most of Whistler's portraits are either full-face or profile. The portrait of Sarasate is a very effective and characteristic one, though it must be admitted that the texture of the evening dress is not conveyed; it is only a mass of black, bringing out the face by contrast with great vigour, and forming with the shirt front an "arrangement in black and white." The portrait of Mrs. Louis Huth, in the South Room, has more freedom of line than most; the sitter, in an evening dress with a train, is painted as if just in the act of turning round, the sweep of her dress making a kind of spiral line. To our thinking, however, the most remarkable of all the portraits, as a picture, is the well-known one of a child, Miss Alexander, which hangs in the West Room, and which is a palpable and very successful attempt to emulate Velasquez in his own line. The painter is known to have given immense pains to this picture, and we should say, from our recollection of it when first exhibited, that it was much worked upon since then.

As it stands now, in spite of something unsatisfactory in the colour and texture of the face, it is on the whole the most remarkable work of its class that Whistler produced.

Of the landscape and sea sketches (for none of them are much more than sketches), and the class of works called "Nocturnes" and "Arrangements," our opinion is the same as it has always been—that they are unfinished suggestions of effect, often very poetic as suggestions, but which, as Burne-Jones said in his evidence in the case against Ruskin, cannot be regarded as finished pictures in the sense that a true work of art ought to be finished. The "Nocturne, St. Marks" (3 West Room), is a mere smudge; the "Seascape" (4) is a fine bit of atmospheric effect, but the sea is not made out. The "Nocturne, Southampton Water" (9), is a bit of real poetry of effect, as also "Valparaiso" (16) and "Old Battersea Bridge" (17). The latter is a reasonable representation; not so the celebrated "Nocturne in Blue and Silver" (12), which is effective enough as colour, but the bridge is constructionally absurd. Along with such works as these, in the same room, we find such grotesque absurdities as the two pictures of "Whistler in His Studio," in which he has chosen to represent himself as a kind of scare-crow figure; and then our admiration is claimed again by such a bit of real beauty of design and colour as the interior with two draped figures known as "Symphony in White," though the real point of the colour effect lies in the fact that the dresses are not both white, the figure on the right being clad in a low but warm-toned dress which cannot be described as white. We can understand enthusiasm about a work like this; what we do not understand is that, because Whistler could produce such works, therefore we are to admire and accept all his eccentricities and half-commenced suggestions—to say "half-finished" would in many cases be going too far.

It is otherwise when we come to the etchings, especially the fine collection lent by the King, which is hung in the Central Hall. Many of the line etchings, those on the Thames especially, represent the best that pure etching can do, though, as we have said before, we think that most of the exhibitions of the Society of Painter-Etchers can show some works equal to them. The lithographs, of which a number are collected, are mere rough sketches of bits of street detail, such as numbers of people accustomed to sketching this kind of subject could do just as well. The fuss that was made about these when first exhibited was, as we pointed out at the time, perfectly absurd; and it is amusing to see, from some notices in the press, that some of the art-critics have begun to find this out—rather late in the day.

The catalogue is very inconveniently arranged, the numbers starting afresh in different departments and in different rooms, and as there is no heading to the pages giving the name of the room, it is difficult to find out where one is. It is much better to have only one series of numbers in a catalogue; but if there are separate series, the general heading

should be repeated at the top of each page. As it is, visitors are put to much trouble with the catalogue which might easily have been avoided by a more logical arrangement.

NOTES.

Liability of Road Authorities. THE case of Maguire v. The Corporation of Liverpool, recently before the Court of Appeal, again draws attention to a point of great importance to the public. The plaintiff was suing for damages sustained by his horse by reason of its having slipped up at a stone crossing in one of the streets of Liverpool. The evidence was that near one of the slabs which formed this crossing there was a hole in the road 5 in. deep, shelving up to 3 in. and 9 in. across; there was no evidence or even allegation of any want of care on the part of the plaintiff, and the sole defence on the part of the Corporation was that there was no "misfeasance" on their part, and that this being the consequence of "nonfeasance" they were not liable to the individual. The roads were vested in the Corporation by Acts of Parliament, similar in their provisions to the Public Health Act, 1875; but one section went further, and enacted that the Corporation should be liable to be indicted at common law for want of sufficient repair, in the same manner as any individual liable for the repair would have been before the passing of the Act. The Court of Appeal reversed the finding of the Judge of the Liverpool Court of Passage in favour of the plaintiff, and entered judgment for the defendant Corporation, on the ground that this section only gave the right to an indictment by the Crown, and did not confer a right to bring a civil action. We only desire once again to draw attention to the state of the law on this subject. Having regard to the powers now conferred upon Municipal Corporations, the expenses incurred by them, and the protection given them from actions by reason of the Public Authorities Protection Act (1893), is it equitable that they should remain under no direct liability to individual members of the public for a gross neglect of their duties, such as that shown above, because it falls within the legal definition of "nonfeasance"?

Great Queen-street and Kingsway. PROVISION having been made for the rehousing of the working-class population—about 3,700 in number—who are dispossessed by the scheme for the new thoroughfare, the Home Secretary has sanctioned the demolition of all the property needed for the laying out of Kingsway. The work is now in progress in Great Queen-street and in the rear of the west side of Lincoln's Inn-fields. One of the houses calls for a passing notice in our columns, for it has just been vacated by Messrs. Love & Malcomson, Limited, who, at Nos. 74-6, Great Queen-street, represented a firm who were the printers of the *Builder* there during a period of sixty-one years. When this journal was established in 1842 the firm traded under the style of J. L. Cox & Sons; it afterwards became Cox & Wyman, and then Wyman & Sons. When Benjamin

Franklin worked in 1725-6 as a journeyman printer at Watts's, which was then at the east end of Wild-court (south side) behind Little Wild-street, he lodged, as he himself records, "in an Italian warehouse opposite the Romish church" in Duke, now Sardinia, street. Watts removed, it seems, to Charles, since Macklin, street. Wild-court (see the views in the *Builder* of November 18, 1854) and Little Wild-street, leading out of Great Wild-street into Sardinia-place, and the site of the electricity generating station in Sardinia-place, will soon be greatly changed. On coming to England as delegate from Pennsylvania, Franklin visited Watts's, and there saw his printing-press. The tradition that he worked at Nos. 74-6, Great Queen-street is due perhaps to the fact that the press was bought in 1771 by Edward Cox, and used for some time at his works. In 1838 it passed to Messrs. Harrild & Son, of Great Distaff-lane, Friday-street, and was secured in June, 1841, by Mr. Murray, for America. There is a woodcut of it in Leigh Hunt's "The Town," and a copy was deposited in the Patents Museum. For constructing the tramway and pipe and wire subways in Little Queen-street it was found necessary to divert the Great Queen-street sewer into one at a lower level with which the new sewer, passing northwards, is connected. The paving works in Kingsway through the area we describe between Sardinia and Great Queen streets will be begun in June or July.

Railway Engine Drivers. SOME very singular representations were made last week to the President of the Board of Trade by the Parliamentary Committee of the Trades' Union Congress. It was stated that there was a tendency for railway companies to put men who were incompetent in charge of trains. The suggestion was that this was done from motives of economy, but it seems inconceivable that any railway manager would be sufficiently lacking in foresight to countenance such a suicidal policy. Another charge is that men were employed who did not know the road. The half-yearly meetings had not all been held, and Sir E. Paget took the opportunity of assuring the Midland shareholders last week that, as far as their line was concerned, the statement was incorrect. It had always been the practice with them that a driver must sign a statement that he was acquainted with the road, and could run over it in safety, before he was allowed to do so. The deputation suggested that it should be made a criminal offence to work trains with uncertified drivers; but Mr. Balfour pointed out that if the companies' rules were carried out, this would be wholly unnecessary. To our mind, the most unsatisfactory element in the Reports on railway accidents is the too frequent indication that carefully framed rules and regulations are sometimes almost systematically disregarded. The idea of being at the mercy of an incompetent engine-driver is so disquieting that it would be well if all the railway chairmen were to endorse Sir Ernest Paget's remarks—adding an assurance that their rules bearing upon the safety of travel were all being strictly enforced.

Telephone Wires. THE decision of the Postmaster-General to take measures for preventing overhead telephone wires from spoiling the appearance of country districts is laudable. At the same time dwellers in country places must bear in mind that if they want the conveniences of a city they must put up with some of the disagreeable element of town life. Dwellers in country houses complain at one moment because they have not a telephone service, and the next because the landscape is disfigured by telephone wires. But, to use a homely saying, a man cannot have his cake and eat it. At the same time care should be taken by public offices not heedlessly to destroy or minimise the agreeableness of rural scenery. In the Epping case complaint was made that wires were taken across open spaces, thereby injuring the appearance of the landscape. The Post-office seemed to have something to say in the defence; and we, nevertheless, take this as an instance of a thing which should be guarded against.

Walmer Castle. CONCURRENTLY with the appointment of H.R.H. the Prince of Wales as Lord Warden of the Cinque Ports it has been decided that Walmer Castle shall no longer be used as the official residence of the Lord Warden. We presume that this diminution of the conditions under which the wardenship has been held hitherto may in a measure be due to the belief that the serious illness from which a distinguished lady has happily recovered was occasioned by the insanitary state of the building. On May 1 the rooms of historical interest, with the gardens and ramparts, will be opened to the public. In 1892 Mr. W. H. Smith presented to the nation some relics he had acquired of William Pitt, the Duke of Wellington, and others of his predecessors in the wardenship. The jurisdiction of the barons, or wardens, of the five ports was established by William I. Walmer Castle, which is prettily situated in well-timbered grounds close by the sea-shore, was built in 1539 by Henry VIII., who at or about the same time built the adjacent Deal Castle and Sandown Castle. The latter, standing a short distance northwards from Deal coast-guard station, has been broken into ruins by the encroachment of the sea.

Society of Arts. MR. M. H. SPIELMANN gave a lecture on Tuesday evening at the Society of Arts on the Victoria Memorial, which was rendered very interesting by the appropriate exhibition of a series of lantern slides illustrating a number of other memorials to Royal or distinguished personages in different parts of Europe, furnishing an opportunity of comparison with what is in progress in London. The finest of these is Schilling's monument in commemoration of the founding of the German Empire, which, if a little heavy in the style of the figures (as is nearly always the case with German sculpture), has great grandeur and dignity as an ensemble. The worst was certainly Quérol's riotous design for a monument to King Alfonso XII. of Spain, some part of which, one is glad to learn, is to be suppressed. The Victoria monument.

though it was at a disadvantage in being only photographed from a plaster model, takes its place well among these, and is superior to almost all of them in general design; yet one cannot help feeling that there is something in the best French sculpture of this class which is not in even the best English work. Racial difference, perhaps—difference of national temperament, is at the root of it; but one cannot ignore it.

THE Annual Exhibition of

Water-colours (the thirty-ninth) at Messrs. Agnew's Gallery serves to recall one's thoughts to a period when the art of painting was simpler but perhaps more true in its aims than now, when there is so much eccentricity paraded under the name of originality. In the days of De Wint the water-colour palette was restricted, but noble work was produced with it, as many of the drawings here testify, those of De Wint and others. One of the finest in composition is Cotman's "Mouth of the Medway" (4); the manner in which the ship is built up along with the cloud behind it reminds one of Turner. Barrett's classicalities are somewhat weak, but he gets a wonderfully true effect of early sun-light in the drawing entitled "Morning" (39). David Cox, as seen in this exhibition, is unequal: "The Mountain Road" (22), the largest of his works here, is very conventional in the colour and treatment of rocks and trees; he is seen at his best in one or two smaller works, such as "The Hayfield" (42) and "Langhorne Castle" (75). Copley Fielding's rather stale trick of the white sails and lighthouse against a background of inky cloud is exemplified in one or two works here, but he made a fine view of Seaford Cliffs from Newhaven pier (104). Prout is always alike, yet always welcome, he is so thoroughly good in his way, in spite of being such a confessed mannerist. One or two of Mr. John Gilbert's "standard-bearer" style of horsemen are to be seen, which we are rather tired of, but on the other hand it is interesting to meet with a work of his in quite a different manner—a scene from "Midsummer Night's Dream," showing Cobweb, Peashblossom, Moth, and Mustard-seed, doing homage to Bottom. The latter is rather wanting in humour, but the four fairies are delightful, and show the most delicate and finished execution. The two finest things in the room, in quite different ways, are Collier's grand landscape, "Arundel Park" (113), which in its way it would be difficult to beat, and W. Hunt's "His First Effort" (102). The face of the boy, contemplating his caricature picture on the easel, is a perfect piece of comedy in painting, and in itself worth a visit to the Gallery.

UNDER this title there is exhibited at Mr. Maclean's Gallery in the Haymarket a collection of water-colour drawings by Miss Emily M. Paterson. They show originality of style and a keen perception of colour effect. In "Evening from the Giudexca" (2) the effect of the two warm-tinted sails forming the only points of warm colour in the scheme is a charming incident. The artist gets

colour effect from these sails again in "Fishing Boats" (11) "A Dutch Backwater" (9) and "The White Cloud" (13) are good compositions; and in "Grey Holland" (45), one of the larger works, Miss Paterson is as effective a colourist as in the warmer-toned Venetian scenes. In "Campanile San Giorgio" (21) the tower is not straight—a too frequent incident in painters' architecture.

The Modern Gallery.

THE collection of Mr. Colley's work at the Modern Gallery, which we have already

noticed, is now supplemented by a small exhibition of water-colours by Miss Burnaby-Atkins, under the title "Meadow, Wood, and Garden." Masses of bright flowers form an important element in these drawings, and are brilliantly and effectively painted. "Azaleas" and "Herbaceous Border, Scaler's Hill" (50 and 51) are among the best of these. A very effective little picture is made, under the title "Harmony" (14), by the contrast of a foreground of bright flowers with the mass of dark trees in the middle distance; the composition has quite a decorative effect. The collection as a whole leaves a very pleasant impression.

Electric Light Fittings by Mr. Nelson Dawson.

MR. NELSON DAWSON has been showing this week at 111, Jermyn-street, Piccadilly, a number of beautiful electric light fittings, which he has just completed for Mr. Hare's new municipal buildings at Crewe. The designs were made by Mr. Dawson, in conjunction with Mr. Hare, with due regard to the rooms they are to furnish. That for the Council Chamber is naturally the handsomest, and is an exceedingly beautiful piece of work, solid and substantial. The smaller lights are interesting in their design and workmanship, and suitable for the purpose intended. It gives much additional value to a building to have its fittings specially made, more particularly when the architect and craftsman combine so successfully as in the present instance.

Presentation to Mr. Colls.

THE annual dinner of the London Master Builders' Association on Wednesday

evening was the occasion of the presentation to Mr. J. Howard Colls of his portrait, painted by Mr. Orchardson, as a well-merited acknowledgment of the service he had done to the architectural and building world by persevering in an appeal, the successful result of which has done so much to modify the oppressive action of the law in regard to ancient lights. Mr. Colls, who was enthusiastically received, acknowledged the gift in a speech of great tact and good taste. Mr. Orchardson's picture, it is hardly necessary to say, is admirable both as a portrait and as a work of art.

CLAYPOLE BRIDGE, LINCOLNSHIRE.—At their meeting on February 9, the Society of Antiquaries passed unanimously a resolution in favour of the preservation of the bridge at Claypole, near Newark, which is an unusually perfect specimen of the XIVth century period, and is threatened with demolition in favour of an iron one. The bridge carries the road across the river Witham from Claypole, in the parts of Kesteven, into Nottinghamshire.

SOCIETY OF PAINTER-ETCHERS.

THE twenty-third exhibition of the Society of Painter-Etchers and Engravers, now open at the gallery of the Society of Water-Colourists, includes as its special point a collection of examples of etching, dry-point, and mezzotint by the President, Mr. Seymour Haden, with the object of illustrating the variety of methods that may be used in the engraver's art. Among these are included also "etching heightened by dry-point," and "mezzotint enforced by etching." These are old works, "only meant to be looked at for the purpose they are intended to serve"; and in fact they are not among the best things in the room. The main divisions into which etching falls are in reality better exemplified among the general collection of works hung in the gallery; but it may no doubt be useful to draw the special attention of visitors to the variety of methods that may be employed, and the effects produced by them. A comparison of the two views of "Egham Loch" (should it not be "lock"?) taken from the same point and showing the same composition, one (187) in line etching, the other (197) in mezzotint, is instructive in showing how differently the same subject comes out in these two different methods; it would have been more instructive still if the etched example had been simpler and with fewer lines. For the true merit of pure etching consists in indicating a great deal with few lines, and every line well considered; a character of work which is better exemplified in some of the other exhibits than in these; for instance in Sir C. Holroyd's "Watendlath" (212), which consists only of a foreground tree and a few contour lines of landscape; or, in a less simple and reticent manner, in M. Béjot's views in Paris and in some of Mr. Oliver Hall's etchings. We do not see among Mr. Haden's exhibits any examples of mezzotint heightened by etching; none are so described at all events; nor can one imagine the effect to be good, the two methods being so radically different—mezzotint dealing with surfaces, etching with lines. The works described as "etching heightened with dry-point" are what we call "scratchy" in effect; all of them have this characteristic, as if dry-point lines had been scored on roughly to give shadow in places. There is no reason why an etching should not be touched up with dry-point to save the trouble of stopping out and putting the plate in the acid again; the mechanical effect for printing is much the same; but if the dry point is used extensively on an etched plate there must be a difficulty in maintaining the same character of line, since the etched line is produced without pressure and the dry-point line requires pressure. At all events, these plates have the result of appearing confused with lines which have no certain aim. An etching should be as free in line as you like—the freedom and ease of the line is its charm; but they should be lines with a definite meaning and trend, not scrawled on in a careless and indefinite manner.

Almost all kinds of black-and-white work that can be produced and printed on plates are illustrated in the collection. Among the works which represent the true and typical art of line etching are Mr. Oliver Hall's "Trees near Hurston Place" (19) and "Half-timber Houses" (26), and Mr. Burridge's "Traeth Bach" (23)—so in the catalogue, in which there are so many obvious misprints that one cannot feel sure of any out-of-the-way title. Mr. C. J. Watson has two very good architectural subjects (30 and 31). Mr. Burridge's interior, "The Little Smithy" (72) is excellent in its pure line style and its effect of light. Mr. W. Monk exhibits nine important works all in a good style, among which we may mention especially "The Rectory Well, Amersham" (81), a bit of antiquity interesting also for its own sake; "The Fly Fishers" (83), and "Chestnuts, Shardeloes Park" (84). Mr. Hedley Fitton's contributions include two good architectural subjects, "The Horse Guards" (139) and "Pulteney Bridge, Bath" (142). All Sir C. Holroyd's are good examples of etching; so are Mr. Urwick's, among which may be mentioned especially "Scotney Castle" (216), a dry-point on pewter. M. Béjot's Parisian subjects we have already referred to; M. Chahine, one is glad to see, shows that he can draw subjects that are not ugly; M. Hellen's dry-point portraits are as good as ever; Miss Margaret Kemp-Welch shows a good many etchings in pure style; Mr. Slocombe has an effective work entitled "The Light of the Great City, Twenty Miles Away" (288), in which the effect is got by heavy line shadowing in the

foreground—the kind of subject which would lend itself better to mezzotint; and Mr. Sydney Lee exhibits two powerful works in a heavy thick black line, "The Bridge" (306) and "The Old Mill" (310).

Among works that are out of the usual lines of etching are Mr. East's powerful set of works in thick black line on a coarse toned paper. Mr. East has made a manner of his own in etching, unmistakably; the effect is rather coarse, but the "Storm in the Cotswolds" (126), the best to our thinking of the set, has a Rembrandt-ish force about it. Mr. Frank Brangwyn carries griminess of effect to an extreme in his large etching "Building the South Kensington Museum" (104), an effect got from a mass of scaffolding, a dingy web of lines on a paper that looks as if covered with dirt. We cannot admire such work; but his "Turkish Cemetery" (109) has more of the power and less of the dinginess. Mr. David Waterson's "Nightfall" (63) is a powerful landscape study. Mr. E. J. Detmold gives an ambitious design of "Prometheus" (1) which is somewhat puzzling in its composition and meaning, and a drawing of a bull ("Taurus"—4) which is exaggerated—a bull evolved from the author's inner consciousness, and of which the left hindleg seems odd in drawing. The drawing of a long-eared bat (8), signed by both the brothers, Maurice and Edward Detmold, is a beautiful bit of delicate work; and Mr. E. Detmold again gives us a fine study of "A Phoenix" (10) with wings spread, a decorative bird whose head seems to be suggested by the Egyptian cloisonné heads of eagles. Mr. Spence's "Dante on the Sea of Ice" (13) does not, we think, realise Dante's idea, which was that of a level frozen sea above which parts of the heads of the frozen sinners protruded; Mr. Spence shows rather the "hummocks" of a terrestrial Arctic expedition. Among fancies of various kinds M. Bauerle's "Autumn" (250), a soft-ground etching of children carrying fruit, is a pretty bit of design; and the book-plates by Mr. Eve, Mr. Sherborn, and Mr. Pott, are all good examples of the kind of decorative and conventional design which should be adhered to in this class of work.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE usual fortnightly meeting of the Royal Institute of British Architects was held at No. 9, Conduit-street, W., on Monday, Mr. J. Belcher, President, in the chair.

Deceased Members.

The minutes of the last meeting were taken as read.

Mr. Graham said he regretted to announce the decease of Mr. James Barnett, of Sydney, New South Wales, who was elected a Fellow of the Institute in 1886. Also of Mr. James Thomson, Fellow, of Glasgow. Mr. Thomson, as they all knew, was the architect of a great many important buildings in Glasgow, and was vice-president of the Glasgow Institute of Architects.

Architectural Education.

The Chairman said he believed he would be acting only in accordance with their wishes in taking that opportunity of offering the congratulations of the Institute to Mr. Reginald Blomfield on his election to the Royal Academy. They all admired Mr. Blomfield and recognised the zeal which he had displayed in connexion with architectural education, as was evidenced by his attendance that evening to give them the benefit of his views on that subject.

Mr. Blomfield said he thanked them very heartily for their congratulations. He thought the honour which had been paid him was an honour, in his humble opinion, for the calling, and therefore he thanked them for the kind sympathy they had shown in the matter.

Mr. Blomfield, in the course of which he said that the subject of architectural education had long engaged the attention of all thoughtful architects. Notwithstanding the increasing tendency to develop school training, and the improvements that had been made in it, the pupilage system had, in the main, held the field. No successful attempt had been made to bring it into relation with the schools and to co-ordinate the various methods of training in use in the latter. It was highly important that a pupil, before entering an architect's office, should have gone through such preliminary training in the schools as would enable him to get his bearings in the office without

waste of time. Hence they had now to consider how the student should be started in his course of architectural training, what subjects he should study, and how they should be taught. To arrive at clear ideas on this matter it was necessary to define what was wanted in an architect.

Architecture is the art that translates construction into beautiful forms; the architect, therefore, must master the principles and methods of construction before he can translate them. His real technique consists of the mastery of building processes: these are the true vehicle for the expression of his imagination. Another highly important matter is the possibilities of new methods of construction. Steel and iron render possible feats of construction which, on economic grounds alone, are irresistible; and it is the architects' business, as artists of form, to study steel and ironwork in order to develop out of its practical use methods of construction which have a beauty of their own in their adaptation of means to ends. The architect's training ought to enable him to take this matter up where the engineer is compelled to leave it through want of training in form and lack of artistic imagination.

Dealing with the unsatisfactory condition of architectural education, the author summarised the chief defects of the present system of schools as (1) faults of syllabus; (2) faults of teaching method; (3) the absence of co-ordination, resulting in waste of resources and loss of driving power. Two years ago some informal conferences of architects were held to discuss the situation; and finally, at the invitation of the Royal Institute of British Architects, a Board of Architectural Education was formed to consider the whole matter. The conclusions arrived at by the Board were embodied in a report which, together with a syllabus, had been provisionally adopted. Five points were dealt with, viz.: (1) Preliminary education; (2) the length of the proposed course; (3) the syllabus of training; (4) the laboratory or workshop for training in practical work; (5) the steps to be taken to initiate and administer the scheme.

As regards (1) preliminary education, it is a difficult matter to assess the exact amount of general education necessary to an intending student of architecture. A student may have great natural aptitude for architecture, but little aptitude or little opportunity of acquiring the knowledge usually given by a good general education. The Board consider it best not to impose any preliminary test for admission to the architectural course, but to leave it to the individual training institutions themselves to lay down the amount of preliminary education they severally consider desirable. The Board, however, consider that evidence should be shown of some capacity in drawing, both geometrical and freehand.

(2) For the length of the proposed course, the Board recommend four years as a minimum—the first two years to be spent in the schools, the last two in an architect's office. The object of this is twofold: first, to enable the student to master his rudiments in the schools, in order that when he enters the architect's office he may know how to learn, and get the full advantage of his opportunities in the office; secondly, that in view of the pupil being partially trained, architects may be disposed to take pupils at a lower premium, and parents and guardians may not be put to a greater expense than they are under the present pupilage system. The pupil should continue his studies in the schools during his term in an architect's office. The preliminary course must of necessity be rudimentary, and should be supplemented by more advanced studies under his old teachers during his two last years. His studies will thus be pursued on a consecutive system, and under competent supervision from first to last. It is suggested that, on the completion of the course, a certificate should be granted to the student in consideration of satisfactory progress and capacity as proved by his work in the schools, and by a study of some architectural project, to include competent drawings and specifications, and an analytical account of the nature and intention of the project. This study should be on the lines of the thesis submitted for degrees in certain University courses. The certificate would be endorsed by the architect with whom the student had served his time.

(3) The first step towards standardising the different systems of training would be the adoption by the schools of a common syllabus. The syllabus proposed by the Board rests on the general principle that construction is the basis

of architecture, and the correlative principle that architecture is the interpretation of construction into forms of aesthetic value. In drawing up this syllabus the Board have been guided by the following considerations: (1) That it should be thoroughly practical, stress being laid on the teaching of construction as the basis of architecture; (2) that it should not attempt too much, that is, should not overload the student with a vast array of subjects, but should cut down those subjects to the essential and irreducible minimum, and insist on the student obtaining a thorough mastery of the subject as far as he goes. The following is the syllabus proposed by the Board: (1) Building materials; (2) construction, including (a) applied mechanics, strictly in practical relation to construction, and (b) the practical methods of the building trades; (3) architectural drawing, including working and freehand drawings, solid geometry, and measured drawings of historical examples of architecture; (4) geometrical projection and rudimentary perspective, this latter to be studied as an aid to the shaping and modelling of buildings, not as a means of elaborating architectural drawings; (5) design and the history of architecture as supplemental to and elucidatory of the study of construction. These subjects would be taught by classwork in the schools and by demonstration in the laboratory or lecture theatre of practical work.

(4) The laboratory or workshop for training in practical work is an essential feature of the scheme. The demonstrations given in the laboratory would be in intimate relations with the lectures given in the classrooms of the schools, and the course would be arranged so that the training in the classrooms and in the workshops should proceed together. The author explained that there was no idea of using these workshops for the purpose of turning the student into a skilled plumber, or mason, or whatever the trade may be. The object was to enable him to see with his own eyes, and if necessary handle with his own hands, the various materials and processes employed, in order that when he had to direct these processes himself in after years he might have actual knowledge and realisation of what he was doing. The author thought there was a little too much of the *dilettante* and the fine gentleman about the modern young architect; he would do better if he took off his elegant frock-coat and set to work in his shirt-sleeves.

(5) With regard to the steps to be taken to initiate and administer the scheme, these must, to some extent, be tentative at first. The scheme could only be got under way by the goodwill and co-operation of the various educational bodies concerned; and it was proposed to submit the scheme and its syllabus to recognised architectural training institutions, and to invite them to adopt it. Where engineering schools exist side by side with architectural schools, as in some of the modern Universities, the student should avail himself, as far as possible, of the training there given; but, generally speaking, it was proposed to invite the county councils to place their technical workshops at the disposal of recognised training institutions for purposes of practical demonstration.

In concluding his summary of the proposal the author said that in recommending the adoption of a uniform system and syllabus the object the Board had in view was to reinforce education, to enlarge its opportunities by bringing the schools into touch with one another, so that, for example, their united resources might admit of beyond their attainments on a level beyond the Board had in view was the establishment of a rigid and inelastic method of training; their aim was the co-operation of the schools in a scheme adopted by them all. It was proposed that the Board of Architectural Education should act as a central advisory body to the several schools, with power to direct the administration of the scheme by means of visitors, who would report to the Board on the work done in the schools. The future constitution of the Board had not yet been determined, but endeavour ought to be made to make it as representative as possible of the profession generally. It was for architects to put their house in order, to prove by visible evidence throughout the country that the practice of architecture is an affair of real skill and solid knowledge; that the architect, from his point of view, is an expert in building, every bit as much as the engineer

tion his. When the public realised that to spend their money on building to the best advantage they must go to the architect as the man who really knew his trade they would readily accord them the recognition due to men of special knowledge and admitted ability in their own calling. The first step to this desirable end was to see to the training of their students, that they, at any rate, should master the technique of the great art of building. So should they prepare the way for the return of architecture to her rightful place as the mistress of the arts.

Sir A. Rücker said he could not pretend to have any expert and very little *dilettante* knowledge of their art, and he had hoped to have followed gentlemen who would have been able to speak more to the point than he, but he took it as a great compliment to the University of London that he should be asked to propose a vote of thanks to the reader of the paper. There was one point he felt strongly about. He had all his life been a devotee of pure science. He did not know that he had ever been set any practical job in the sense that those present regarded a job as practical, but, nevertheless, he believed that no man in the room felt more strongly than he did that if the room felt more strongly which was now taking place in technical education was to have a sound foundation—if it was ever to reach the heights they hoped it would attain—it was absolutely necessary that it should be carried out by, or in conjunction with, those who were themselves the professional members of the great professions and trades which they wished to carry to a higher point of technical education. It was absolutely absurd to suppose that a body of men whose life had been spent in dealing with things from a non-practical point of view should set themselves up to dictate to those whose whole life had been spent in dealing with subjects from a practical point of view. It was only by engineers and architects and shipbuilders taking an interest in the education of the professions of which they were the representatives that the Universities and schools could hope to come in and give some aid to them and carry their aims to a successful termination. It was therefore with the greatest possible delight that he saw a great profession such as theirs, many of whose leading members were gathered there that evening, taking up the whole question of education in architecture from a practical point of view. The ultimate success of any scheme must depend on that and that alone, and if the organised educational bodies could come in and help in the matter he hoped the profession would regard it that they came in in no way to dictate, but that they would feel it an honour to be asked to help their great profession. For the moment he was speaking of the Universities in the great centres of population, and he regarded it as a matter of the greatest importance that those Universities should not stand aside and merely look on while these great movements were going on all round them. He knew there was an idea abroad that the University was a body which regarded itself with the utmost complacency, and was prepared to lay down rules and regulations for the instruction of everybody in everything. He trusted what he had said would show that there were some amongst them who did not accept that definition. On the other hand, he would like them to remember that, after all, it was a matter of the very greatest importance that young men aiming at different professions in after life should, so far as possible and within reasonable limits, be brought up side by side. It was not a good thing that the members of the different professions should become a mere caste—to be educated from the first apart from all others who were likely to be interested in the future in other things. He might say as an old Oxford man that the greater part of the good they attained in the old days in Oxford was gathered not merely in the classrooms or from the beautiful surroundings of the University, but from the friction between mind and mind and from the mutual converse of able undergraduates who had different aims and objects in life. Something of this sort ought to be attained in any great scheme of education, and he hoped in carrying out their scheme they would do what they could to place the young architect not merely in a separate architectural school, not merely in an architect's office, but that there were practicable some part of his education should be

taken in an institution where he could mix with others who were intending to follow other professions. This could be attained, perhaps, only by the co-operation of the Universities, and he sincerely hoped that the University of London in the future might be able to carry out within its own schools some part of the scheme which Mr. Blomfield had laid down. He recognised that it was for the profession to say what was requisite for the architect, and it was for the University to follow, but at the same time he did think the University would be able to do something in providing the general sub-stratum of education necessary for any man to reach the top of a profession, and also provide something of this mixing of undergraduates of different types which he had referred to, and which was of the greatest possible value. If he could take it that they were with him in the matter then he might say he hailed with great pleasure what Mr. Blomfield said in interpreting the word "uniformity." When he came across that word he was a little doubtful as to what it meant. He would very much regret if they were to use the word in the sense that all architects were to be brought up on an absolutely uniform system, and that the details of the course were to be laid down as rigidly as the route of a railway was laid from one town to another. That, however, he took it, was not the meaning, but they left room for initiative and reform, and for a gradual growth of their system into something which would probably be greater than what was at present mentioned. If that was so, and he took it that it was, he could only say he was most heartily with them, and since he came into the room the last doubt left in his mind as to the feasibility and practicability of their scheme had been wiped away. He trusted that they would regard the University not as a rival, but as a friend in these matters. He trusted that their own Board of Architecture would be of service. They had the late President of the Institute, Sir Aston Webb, as chairman of their Board of Architecture, so they would agree that they had sought instruction at the fount. The work of the University of London had been specially laid down as being that of the co-ordination of the higher education of London, and he had been working day and night to contrive schemes by which the wastage which had characterised London education in the past might be done away with. He wished them to recognise therefore that the University was working side by side with the architectural profession in the hope and desire on the one hand to co-ordinate education and prevent waste, and do as much as they could with the limited means at their disposal; and that on the other hand they recognised the attempt of a great profession to make its education worthy of itself and to produce, as he understood from Mr. Blomfield, a new history in architecture in this country, so that it might cease to be a mere study of what he might without offence call "dead form," and become a real constructive profession.

Sir Aston Webb, in seconding the vote of thanks, said he found himself entirely in agreement with Mr. Blomfield. It had been his pleasure for some time to work with Mr. Blomfield in this matter, and they were greatly indebted to him, and also to Mr. Slater, who had acted as hon. secretary of the Board of Architectural Education. It was a fortunate thing that they should at this stage have Mr. Blomfield to explain to the members of the Institute the position to which they had at present attained. They all thought the matter of architectural education was one in which they as architects, to whatever school of thought they belonged, might unite and work together. They had only one object, which was that those who came after them might have better opportunities of acquiring knowledge in architectural matters than they themselves had had. Probably they all felt enormously the great disadvantage under which they had carried on their work in their earlier years, and were all sincerely anxious that in the future they should remove as far as possible those difficulties and disadvantages. Architecture was a difficult and complex enough art at the present day for anyone to undertake, and the least they could do was to try and remove the unnecessary difficulties which certainly had laid in the way of most of them there that night. They would all be much encouraged by the words of Sir A. Rücker, and when they came to the higher forms of education they would be only too glad to avail themselves of the assistance,

which he had foreshadowed, of the London University. They were attempting no cast-iron scheme, and they would probably find that the scheme could be improved. They would like to feel that year by year it was open to improvement and could be improved, and therefore this was merely laid down as a tentative scheme which, as experience required, would be altered whenever any improvement could be suggested.

Mr. H. H. Statham said he was very much in agreement with Mr. Blomfield, and even more in agreement than he had expected to be, and therefore he had little to say. With regard, however, to the remark as to the doubtful way in which architects were regarded in this country, he was not sure that was not as much the fault of the public as of the architects. This was an inæsthetic country, and they could not get people to understand what the art of architecture was. In France they understood it much better, and the fact that a man was an architect was a reason for respecting him. In England it was a reason for being puzzled about him. He thought the tone which Mr. Blomfield had taken in speaking about the importance of the practical basis of architecture and practical knowledge was very much wanted at present, and he hoped what he had said would have its effect. But he was rather sorry to hear something like a slur cast upon the drawings of the French architects. There was this to be said for the French system, that it had kept before the students what they might call the intellectual aim and the intellectual side of architecture, and might there not be a danger of paying too much attention to the details of construction as well as of paying too much attention to the details of ornament? Both were incomplete, and the best thing about the French system was this—that the students appeared to be taught to consider plan and design as going together. The plan was as important as exterior or detail. What was it that made the interest and beauty of that remarkable building, the Petit Palais on the Champs d'Élysées? The ornament and sculpture was very fine, but it was not merely that. It was the fact that the whole conception of the building was a new and original one. It was unlike any other building. It was the plan and treatment going together that made it, and that was what it seemed to him the French had brought out very much. He thought that as a rule the most important way in which to regard architecture was not to exaggerate ornamental detail on the one hand or mere construction on the other hand, but to regard the evolution of the great idea in plan and design as the object to be kept before one. They could not help being struck with the contrast—he was rather afraid of saying this, for there were several Royal Academicians in the room—with the fact that in the Paris Salon they saw plans of every building in the architectural section to a large scale; while in the architectural room of the Royal Academy they saw as little of plans as possible. Of course, there was very much less space, but still he thought plans were not encouraged as they should be, and he had known people actually send in perspectives without the plan because they thought the plan would spoil their chance. He would like to see in their own small architectural room a greater importance given to plans in the annual exhibition, and to see the addition of a plan made a *sine quâ non*. That was so with the French, and he thought they were right.

Professor Simpson said he felt thoroughly in accord with everything that Mr. Blomfield had said in his paper, but there was one little point he might be allowed to refer to. He believed it was said that there had been no attempt to bring the pupilage system and schools into accord. He could not speak with certainty of all schools in England, but he fancied there had been more done in that way than Mr. Blomfield implied. In Liverpool, certainly, the attempt was made, and was working fairly satisfactorily. Ten years ago he went to Liverpool University, and at a meeting of the leading architects of the town they approved of a two years' course of education, and passed a resolution that they would reduce the premium and the term of years to students who had passed through the college course and obtained the college certificate. He was pleased to bear testimony to the fact that they had adhered to that resolution most loyally and generously. Following on the two years' course there were two evening classes, which the students attended to a very great

extent, and at these two classes some of the leading architects in the town acted as visitors. In Liverpool at least, and he believed elsewhere also, the pupillage system and the courses in the schools were brought into relation with one another. After passing through the course at the college the pupils served for two years, and the premium was reduced, sometimes a half, and sometimes more, or less, according to the ability of each student. He was glad to hear Mr. Blomfield lay such stress on the necessity for museums of models, and there could be no doubt but that they were extremely valuable. One of the great difficulties, however, was the inability to obtain models. Of course, they could have these made specially, or themselves, but it took time and was expensive, and he only knew of one firm in England which made models of construction. In France it was different, but he found from experience it was a little difficult to choose models from photographs, and it was not always convenient to pay a visit to Paris for the purpose of purchasing a few models, although he confessed that the excuse would be a good one for going over to Paris.

Mr. T. G. Jackson, R.A., said he had listened with the greatest interest to Mr. Blomfield's address, who he believed was the father of the scheme, and it was very much due to him that it had been brought to its present state. That there was room for improvement nobody could doubt. If we looked back into the history of architecture we must admit that never until the middle of the last century could one be pretty sure that out of ten buildings put up nine would probably be bad. There never was a time when there was such a large proportion of work that was inartistic—he would almost say base. There was a great deal of that still going on. They had showy commercial architecture which disgraced their streets—architecture which seemed to show that the only idea the designer had of art was that it consisted of ornament. The question was, how could that be altered? He thought with regard to their rising architects there never was a time when there was more promise. They noticed in the work of these men a feeling of restraint which was very different from the kind of work he had alluded to. Their aim must be to bring the whole class of architects, as far as they could, to the same style as that which they looked for from those who were the hope of the profession in the future. The keynote of the whole scheme which Mr. Blomfield had initiated was that architecture should be based upon constructive principles—that was merely saying that architecture was not a matter of fancy and imagination and caprice, but that it was founded upon reason and common sense; that the development of architecture in the past, if they traced it out scientifically and with a true historical spirit, would be found to have arisen almost entirely in the first place from suggestions and difficulties of construction and difficulties of material and appliances, which had been, in fact, the most powerful means of inspiration to the architect. The true artistic spirit seized upon those difficulties and suggestions, and from them produced the finest productions of art. Well, they wished to bring back the study of architecture to that view. That being the keynote of their plan, the point was, how were they to apply it? He was glad to see there was to be no strict test for admission to their courses of study. The great thing was to sweep up all those, whoever they were, upon whom they had to rely for their buildings. For ordinary buildings it was well known that architects as a rule were not employed. Perhaps nine out of ten buildings were put up without any architect. Were they to be content to leave them to their chance, or were they to try to do something to raise the level of architecture all round? He trusted that scheme would be as useful to builders and engineers as it was to those who were more strictly speaking architects. For ordinary domestic architecture, which rose about them in the development of building estates and so on, it was inevitable that it would be done not by professional architects but by people who were architects in a fashion, but not those they called professional architects. He remembered a case where one of the colleges of Cambridge, having some land to develop, thought they would exercise an artistic influence upon the design, and they employed an architect to design the kind of house they wished to put up, and then they offered the land in the market for builders. Not a builder moved. They waited a long time, and the land did not go off, and then they

relaxed the conditions, and allowed the builder to design his buildings under certain approval, and the land was covered with buildings in a short time. That showed what must be the case, and it was for them to remedy that state of things. These men, if taught some of the elementary principles of architecture, would do better things than they had been doing. He was happy, therefore, to think that there would be no test to restrain anybody coming in to improve himself. Sir A. Rücker said it would be a mistake to make the syllabus too rigid, and he thought the syllabus should be in the nature of suggestions to different schools. He would be very sorry to see any school tied down to a final system of instruction. They must allow for the peculiarities of different places. Some teachers had a greater facility for teaching in a certain way, and they might be hampered by the strict rule of a syllabus to which they might be obliged to conform. A syllabus would be immensely useful which suggested the lines that instruction might usefully take, but which did not tie the teacher and pupil down to one particular curriculum. In South Kensington the Council of Art had lately produced a syllabus to send all round the country, but it took the form of suggestions, and the different art schools were permitted a certain latitude. There was also the question of visitors. Part of the scheme which they had been elaborating at South Kensington for the different art schools consisted of the hope that they would have visitors to go round and help the masters with suggestions. He did not know whether the scheme described that night could be brought in any way in relation to that. It was quite possible they might put themselves in relation to that, and it would be very helpful. Then there were the workshops, which, of course, was a difficult matter. Whether it would be possible to arrange with builders to allow the students to have the run of their workshops he did not know. To start workshops of their own would be expensive, and could only be done in large towns. In remote places it would be difficult to give the students the same facilities. A great deal of good would be got by their alliance with other artists. If painters and sculptors and architects could all mix more together it would be an admirable thing for all. If every sculptor learned a little architecture it would do him an immense deal of good, and if architects mixed with those decorative artists with whom afterwards they might be allied it would give them greater ideas. But everything, after all, depended upon the student. They might provide the best education in the world, but it depended upon the man, after all. He believed a great deal in the ping-pong system himself, and that the most education could do was to make it easier for a man to pick up knowledge. They should put opportunities and suggestions in their way, and help them in difficulties, but beyond that he had not much faith in any system of education. They might provide the fount, but it was impossible for them to say when the wild asses came down whether they would quench their thirst there.

Mr. John Slater expressed his thanks to Mr. Blomfield for the immense amount of time he had devoted to the question. With regard to the few words which fell from Mr. Statham as to the French system of education, he could not help thinking that the great drawback of the French system was that it tended to stereotype the methods of the people who followed it. He remembered someone in the room remarking that when an eminent French architect came over to this country and saw the number of drawings in the building papers done by young men, he said that with all their system of education in France they could never hope to get such originality as he saw here. It was stereotyping that they should avoid, and Mr. Blomfield had explained that there was no uniformity in that sense which they were advocating in their scheme of education. He heartily endorsed what fell from Sir A. Rücker as to the desirability of a student who intended to practice architecture having an all-round education, and mixing with those with whom he would probably have to work in after life. He felt perfectly sure that the more all round a man was—granting, of course, his genius and capacity for taking pains—the better an architect he would be.

Mr. Maurice B. Adams said that during his many years' connexion with the Institute things never appeared to him to be so hopeful as they were at the present moment. He took it that

it was to the schools of art which Mr. Jackson had alluded to that builders and others must turn for any degree of elementary instruction in architecture. Architects as a professional body could not be expected to teach builders the art of architecture, because architects had to take a more limited view and try to train their own students as professional architects. The teaching of applied design had been very materially improved, as anyone would have seen by going to the Royal College of Art Exhibitions which was held last year. It was true that a great many of those students who were most successful in the architectural department in National Students' Competitions were those who had competed for prizes at that Institute, and, personally, he thought it would be better if the original work was limited, and that if a design which, for instance, had gained the Soane medallion at that Institute was not allowed to receive a gold medal at South Kensington. There was no doubt that the present educational scheme was of the utmost importance. He had been to Liverpool lately and heard of the immense good that Professor Simpson had done there, where he had raised the whole status of the architectural pupils in the town. All these circumstances should give them hope. What struck him most was that the Institute, which did not profess to be a teaching body, was seriously taking up this education question which competition abroad was forcing on them. Whether they agreed with the French or American or German systems or not, they must make themselves more competent in the craft in which they were engaged. What he wished to emphasise was the need of co-operation amongst the whole of the profession, for he was afraid the majority of English architects did not take that interest in this problem which it was imperative they should. All over the country there must be a co-operation and unified action or they would never succeed.

Mr. E. M. Gibbs (Sheffield) believed the scheme would be most cordially received in the provinces and carefully considered. The scheme was very comprehensive, but at the same time it was elastic and full of detail, and it was impossible to discuss it that night. One point, however, he thought had been overlooked which was that in the syllabus there was no provision for elementary art training. Mr. Blomfield pointed out that the art of architecture was the putting of sound construction into beautiful form, and to his mind the very first thing a young architect ought to learn was to draw and shade and appreciate the subtleties of surface and the beauty and variation of shadows, and study form in every way, and also colour. He thought that might well be put in as a sixth subject.

Mr. G. A. T. Middleton said that one of the greatest and best features of the scheme was that it was not intended to centralise the architectural training in London. The object appeared to be to distribute it at least amongst the great provincial centres. There must, however, be always a class of students who were not to be reached in that way. There must be many whose parents lived in small country towns out of the reach of schools where architecture was taught. Those students would in the future, as in the past, be article in small country towns, and how were they to be reached? There they had another great problem, and it was one which the scheme did not at present propose to deal with. He felt that the means by which the difficulty could be overcome was not difficult. It was by correspondence. Correspondence-teaching had hitherto been left in the hands of a few private persons. He had had twenty years' experience of it, and could assure them that it was a successful system. He would like that question to be taken seriously in hand with a view to teaching those who lived in out-of-the-way places.

Mr. H. C. Corlette said he was of opinion that the period after the student had done his special school work would be better lengthened to three years. Two years seemed to him rather short, especially if the pupil was to spend part of that two years in carrying on the work he had begun in the school. He took it that some of that work would be done in the day, because if a man had to work night after night he would not be much use in the daytime. Mr. Blomfield had mentioned the study of old buildings, and it appeared to him that if the study of old buildings was done a little more under supervision than was usual in the past it might be very useful for future students. If a man

chos: to take up a definite period of architectural development, would it not be advisable if he selected a certain building and during his student days made a study of it from the foundation to the roof—not for a few weeks, but for a year or two years. This might lead him, while studying the building, to understand something of the artistic and general history of the period during which it was built. By that they would stand interest to his studies as an architect, and not necessarily make him an archaeologist. With regard to drawing, it might be better if they, as future architects, looked upon drawing not as an end in itself, but more as a hard craft which had to be learned so as to explain their ideas to others. He understood that what Mr. Blomfield meant by uniformity was that in their aims and principles there should be uniformity, but that there should be great diversity of method in the teaching which should be adopted in the various centres. In the case of architecture they were dealing with a question of education which might be considered as an Imperial affair. They had some thoughts of Australia and Canada in their minds when they thought of architecture, and especially in the case of Australia he knew there was a very great desire on the part of men out there to be much more in touch with things in the Old World than they were at present. In Australia they had more of the old buildings which they had in Europe to study, and whether it was possible to open up any communication with them and let them see more by models or by drawings what had been done in the past, and what was being done in the present, was a question which might perhaps be considered by some representative committee.

Mr. H. G. Iberson said much had been said about instruction, but little about examination. He felt there was always a tendency if examinations were put to the front for that somewhat dangerous individual, the professional crammer, to come into play. There was the danger where examinations were made prominent that people would look at the examination as the end rather than the means, and instead of attaining a true education, which was to act with intelligence, a man was made more or less of a machine. He also felt there was a danger in schemes of education that the instructor would enforce his mind and his ideas with too great vigour upon the pupil, and so have a tendency to destroy the individuality which was one of the most valuable things in connexion with a profession like theirs. If he might go from the general to the particular, he would like to say he hoped in the new scheme there would be an opportunity for pupils to be taught what might be described as the gentle art of condemning materials. He remembered an examination where there was an estimable gentleman on one side of the table and on the table there were specimens of materials, but he did not remember that there was one material which was bad, and he found it more important for him to be able to distinguish between good deal and bad deal than between deal and oak.

Mr. E. Woodthorpe said he was pleased to hear what Sir A. Rücker said, and he felt that what was wanted was another Cecil Rhodes to found a professorship of architecture at the older Universities, and, if possible, have a final school in architecture. Architecture, he considered, was far more important than medicine even, but it seemed to be absolutely neglected by the public so far as any education went. He was at a public school, but drawing was practically untaught; it was mere mechanical work of little good to anyone. There was one way for a student to acquire practical knowledge after he was out of his articles which Mr. Blomfield did not mention, and that was by going as clerk of the works. He was perfectly certain if young architects went as clerks of works they would get much practical knowledge. It had been said that Mr. Blomfield originated this scheme, but the papers read in 1887 at the Conference of Architects expressed a great deal of what was now brought forward. He trusted most sincerely that the outcome of this scheme would be more profitable of good than that conference in the past. He was not surprised to hear Mr. Jackson say he was doubtful about the result. He (the speaker) was not afraid of the result provided they had an examination to look forward to. He believed there were about 10 per cent. of architects, and probably members of all other professions, who would succeed and get to the top of the tree who did not believe in examinations, and would work without examinations, but the other 90 per cent., unless they had some examination to work up to, would never read and

remember what they read. The great idea of education was to put into one's head everything they ought to know, but there were few who had such a retentive memory that they could remember all these things. What the young architect wanted was to know what books he could refer to on any particular subject.

The Chairman said they had had a good, practical paper. Of course, there would be a great diversity of opinion on details, but that depended so much upon the outlook and general experience of the architects themselves. While uniformity was essential, as they had heard, it was not essential that the details should be altogether uniform, but they might vary according to the needs and necessities of the different localities where schools exist. He thought the remarks they heard very much cleared the ground, and when this scheme of the Architectural Board came before them they would be able to accept it generally to the advantage of architectural education.

The vote of thanks having been heartily agreed to,

Mr. Blomfield said he was bewildered by the number of excellent suggestions which had been made. He did not follow them all entirely, and could not quite follow Mr. Woodthorpe's suggestions about the Universities.

Mr. Woodthorpe: I said they should make one final school of architecture.

Mr. Blomfield said as to the suggestion of young architects acting as clerks of works, he did not think he would learn anything unless under proper control. It would not be fair for the client, for the builder would have him at every point. A reference had been made to him being the author of the scheme, and he would like to put that right at once. This report was the result of the deliberations of the Board, and was put together as the result of the opinions of all the members of the Board, and it was therefore the collective effort of a great many gentlemen who had given a great deal of time to it, and he need hardly mention the immense debt they owed to Sir Aston Webb, who was the chairman and had guided their deliberations. It would be impossible for him to deal with the many points which had been raised. Mr. Maurice B. Adams had made some excellent remarks, although he could not quite agree with him about the National Exhibition. His experience had been a little different. The students seemed to him to fail precisely in this point—the practical grasp of architecture. They made beautiful fronts, but did not seem to know what it all meant. The tribute to Professor Simpson's work he heartily endorsed, and he hoped he would continue that work in London. Mr. Statham made some very interesting remarks in regard to French architecture, but he did not quite agree with him with regard to the drawings to which they must undoubtedly devote a great deal of time.

Mr. Statham said he was not advocating the French system. He only said there was a fine side to it.

Mr. Blomfield said he thought it possible that the fine side might be got without all this trouble. They did not want the student to look only at Gothic tracery, but to think for himself and use his own material as an intelligent person with, of course, full knowledge of what had been done in the past. They were all grateful for the generous welcome Sir A. Rücker had given to this scheme, and it was a most encouraging thing that the educational authorities of London were doing their best to assist them. He endeavoured to make it clear in the paper that the uniformity was not uniformity of detail, but of point of view. They wanted all the schools to be worked from the same point of view and leave every individual unhampered.

The Chairman announced that the next meeting would be held on Monday, March 6, when an election of members would take place.

ST. PATRICK'S CATHEDRAL.—Alderman Sir Walter Wilkin, K.C.M.G., has announced his intention of presenting a stained-glass window for the chapel in the south aisle, formerly occupied by the Wellington monument, which is to be altered and refitted as the Chapel of the Order of St. Michael and St. George.

CHURCH OF ST. PETER HUNGATE, ELM HILL, NORWICH.—It is stated that the Consistory Court will be asked to grant a faculty for the demolition of the old church of St. Peter Hungate, on Elm Hill. The church is cruciform on plan, with a western tower, and is constructed mainly of flint. The interior was restored about thirty-five years ago.

THE ARCHITECTURAL ASSOCIATION.

THE following is the conclusion of our report of Mr. C. S. Spooner's paper on "Church Fittings" read before the Architectural Association on the 10th inst., the first part of which was given in our last issue:—

Stalls and Desks.

Mr. Micklethwaite's tract tells us that "Well-furnished churches had stalls with misericords, or turn-up seats and desks on each side of the chancel, and returned at the west end against the screen. Parish churches had only one row of stalls, but sometimes there was a bench in front of the desks for the use of song boys. Poor churches had plain settles instead of stalls."

The growth of the choir in most modern churches necessitates a considerable amount of accommodation. I must say I think many churches have too large a choir. The old arrangement can hardly be improved upon, unless it is considered better to turn the choir out of the chancel and put it into a gallery at the west end. There is, no doubt, much to be said for both plans, and, where the chancel is small, it is certainly better not to block it up with choir seats and organ.

One row of seats for men and one for boys on each side of the chancel should be enough for any parish church. I think it is better not to divide the seats with arms or elbows, as that arrangement would make the whole very long and would fill up the chancel too much. The great thing is to arrange the seats not only to leave plenty of room in the chancel, but also to give the appearance of space. I think it is a mistake to raise the choir seats above the level of the chancel, and better to stand them on the floor. If raised, too much prominence is given to the choir. No better arrangement has yet been devised than that of returning the back row of seats against the screen for the clergy. These seats might very properly be divided by elbows, when that luxury can be paid for. The advantages of this arrangement are that the clergy are brought well out into the church, in the most convenient position for them to take the services. In the greater part of morning and evening prayer they act as the spokesmen for the people, and should face the same way, and in the parts where they address the people they only have to turn round where they stand to do so. They are not separated from the choir, and yet occupy the most important places—as they should—and there is plenty of room for all the staff connected with the parish, and generally some over for any extra clergy who may be present on special occasions.

The desks should not be too near the seats, nor too high, plenty of room should be left for kneeling, and the height convenient for that attitude; there should also be an extra shelf, or shelves, for books below the desks. The boys will only want a desk, which should be as small as convenience will allow. Mr. Percy Dearmer, in his book, suggests that boys behave better without a desk and kneel upright, which is, no doubt, very desirable, and it would look better in the church, but it strikes me as being a little hard on the boys to have no place for their books.

The great lectern stood in the middle of the choir, and upon it lay the books for the choir office and the service of the altar. Now that everyone can have his own book such a lectern is unnecessary. It is, however, usual to provide one for a big Bible. The old lecterns in the form of an eagle were probably used to read the Gospel from, and stood on the north side of the sanctuary. The form is equally suitable to read the lessons from, and, if artistically treated and made very unlike a real bird, may be rather nice.

Personally, I don't think the form a very good or suitable one for a desk to carry a book. The thing is, after all, a desk, and the more it looks like what it is the better. The various attempts one has seen at a figure representing an angel holding the book upon his head would, if even passably executed, be open to the same objections as apply to caryatides.

The form of a double or single desk seems to me to be much the best; it may be treated in a great many different ways, with or without candle-holders, and may be made of either wood or metal. The lectern should stand on a step or platform raised above the level of the nave, more or less according to the size of the church. The top of the desk should not be too high, or the reader's voice is checked. This is one of

the few cases in which utility clashes with appearance. In the case of a single desk, it certainly looks better for it to be steep, and to rise well in front, but there is no doubt as to which ought to be sacrificed.

A long lectern cloth over the desk, and hanging low down front and back looks extremely well. It should be of rather heavy material, the exact width of the desk, and be finished with a good fringe at each end. It may be decorated with embroidery, but, if so, there should be a good deal of embroidery, or else none at all, and the design should, I think, be restrained and quiet, something that will give a rich general effect. Embroidery is necessarily expensive, and, unless it is thoroughly good and artistically done, it is rather disagreeable than otherwise. Poor churches must dispense with such an expensive luxury. A good woven material will look very much better than any but the best embroidery.

The Organ, etc.

It is important, when planning a church, to provide a place for the organ. Much has been said about the best position for it, and I understand that musicians agree that a gallery at the west end, or the roof loft, is the best place for it. There are objections to both of these places if the church is not very lofty. Unless there is a clearstory, a large west window is necessary to light the church and an organ at the west end would block up this window.

Now, it is difficult to make a clearstory look well from the outside, unless a good deal of money can be spent upon the building. I have not seen a modern inexpensive church with a clearstory that seems to me successful externally. I particularly dislike a lean-to roof over the aisles. Lofty aisles with a flat roof and a parapet get over the difficulty, but this is, of course, rather expensive and may not suit the position of the church. A minimum height of 17 ft. is wanted for an organ, and that will only do for a small one—33 ft. is wanted for a fair-sized organ. A clear space of even 17 ft. above the roof loft to the wall plate means a lofty church. The organ should be divided and placed each side of the loft in any case, as the middle is required for the road.

It is obviously objectionable to shut the organ up in a small chamber. Perhaps the best way is to divide it and provide two small, shallow transepts on either side of the chancel for the swell-box and other parts, and to bracket out for the pipes. The drawback to this plan is that it adds a good bit to the cost of the organ. I shall be much interested to hear how others have got over the difficulty.

The organ case may be made a very pretty thing in a church, especially if the instrument is bracketed out from the wall. Unless the pipes are gilt, they look best the natural colour, and, if decorated at all, the patterns should be very quiet and not conspicuous and of such a kind that the pipes always look like organ pipes and nothing else. They can be grouped to suit the position and surroundings, and can be supported by bands or rails framed into, or attached to, posts or uprights. The lower part must be panelled, to hide the bellows and the unsightly parts of the instrument. It is better to arrange for the organ to be blown by a small gas or oil engine or an electric motor, as being more convenient and, I understand, cheaper in the long run than hand labour. But if the organ is to be blown by hand, then the lever should be so arranged that the blower is not shut up in a chamber where he cannot take part in the service.

Pews.

Late medieval pews still remain in some churches. Where they were provided, they were arranged with wide aisles both in nave and aisles, and were placed in a block towards the east of the church, leaving a wide space at the west end. Modern churches are too much blocked with pews or chairs to look well. At St. Agnes', Kennington, I noticed many of the chairs—which, by the way, are not battened together—are piled together at one side out of the way, leaving a good many in a block each side of the middle alley towards the east of the nave, quite enough for use on a week-day. This not only has a very good effect in the church, but it gathers a small congregation together. English people seem to be very shy, and they will slip into a church and take a seat in the nearest back row that is unoccupied. We have all seen a very fair congregation scattered about over a good-sized church, giving a sense that there are very few present.

Some of these medieval pews are very nice pieces of furniture. They may not be very comfortable, but comfort is a more or less modern invention or discovery in the north. We must remember that people in the middle ages went to church to take part in the service of the altar, not to sit and listen to a sermon, and these pews would not be used for sitting very much. There was a good deal of movement, and much more kneeling and standing than English people have been accustomed to of recent years, and, besides this, these seats were not much more uncomfortable than the seats the people had at home. They generally have a solid end, shaped at top, sometimes into a "poppy-head," with a moulding running down the edges, and the outer face was very often carved. The seat was framed into these ends, and also a rail, often moulded and carved, to lean against. One or two rails lower than the seat strengthened the construction. The pews at the older of the two churches at Walsingham, in Norfolk (I forget to whom the church is dedicated), are the best examples I know of medieval pews.

The church itself, too, is a very beautiful example of a XIVth century parish church—unrestored. I think pews should be made as inconspicuous as possible and light in appearance, with either solid ends or framed ends and with low backs, to enable people to kneel comfortably and reverently. The rule of the Ecclesiastical Commissioners that seats must be 3 ft. from back to back should be looked upon as the minimum—3 ft. 3 in. is better. Mr. Norman Shaw has designed the best modern pews that I have seen for the church he built at Bedford Park. As to material, of course any wood may be used. There is one, however, which, in my opinion, should not be tolerated—I mean varnished pitch-pine. In colour and grain, I think, it will most certainly disfigure any building into which it is put. Without varnish it might be just tolerable. I cannot see why cheap pews should not be painted and varnished. If the painting is well done and the varnish allowed to harden before they are used, they will last for a very long time, and, when very shabby, they can be repainted and made to look as good as new. A harmonious and quiet colour can be used, which will add much to the look of the church.

The Pulpit.

A pulpit "was ordered by the injunctions of 1547 to be provided where it did not already exist." The pulpit may stand in almost any part of the church. The Rev. Percy Dearmer says:—"As a rule, it should not be east of the easternmost row of seats, but should project a row or two into the seats on its side." He further suggests "that the floor of the pulpit be not lower than the shoulders of the people when they are sitting down," and he recommends that the position for it should be carefully tried, until the spot in the church is found:—
(1) Where the voice rings truest and clearest with least effort. (2) Gesture becomes most easy and unrestrained. (3) The largest part of the congregation can be seen." And he adds, "It will generally be found that the same place will be best for all these purposes." Obviously, a position in the middle of the church where the pulpit would hide the altar or compete with it in importance is impossible.

The height of the floor will, of course, vary with the size of the church, but it should never be very high. That elevation which gives the preacher command of the whole congregation is sufficient, and no more should be given. The sides of the pulpit should be 3 ft. 3 in. above the floor of it, and the top should be broad enough to hold books. A small removable desk is necessary for those who use manuscript or notes. It should be so contrived as to be easily raised and lowered and easily and rigidly fixed. I think, on the whole, this is best made of metal, with a leather desk tightly strained, and I think that horrid little cloth called by the shops "antependium" should be eliminated. The diameter of the pulpit should be ample, never less than 3 ft. A seat is unnecessary. A lower shelf inside is useful for books, and a secure corner for a glass of water where it cannot be upset is convenient. A sounding-board over the pulpit is generally advantageous to both preacher and congregation, and may be made to look very well in the church. A background of wood is often helpful to a weak voice. I think wood is very much the best material for a pulpit; it looks well painted and adds colour to the

church. Stone and marble are comparatively cold in this climate, and so is metal.

The Font.

After the altar, the font is the most important thing in the church. The best place for it is at the west end in the middle. If there is a room, let it stand on a raised platform, as at All Hallows Church, Southwark, for instance. It should be large and of handsome material and a cover is essential, which may be made of wood or metal. Stone or marble are perhaps the best materials for the font, although metal may be used. There are several medieval fonts of cast lead still existing. It is customary to line fonts with lead, but, now that the water is blessed at every baptism and discharged into the earth when the service is over, it seems to me unnecessary, unless a porous stone is used. Most of the bishops, however, I believe, still require it to be done. A waste pipe is necessary, with a plug. This pipe must discharge into a dry well in the ground. A desk to hold the priest's book is a great convenience. It is seldom provided, but it seems almost necessary. The priest can hardly hold the child and the book while he is administering the sacrament of baptism. He lays it on the edge of the font usually, but, besides the risk of its being tipped into the font, there is risk of damage by splashes of water. Such a desk should be of metal, with perhaps tightly-laced leather to carry the book. It might be removable, fitting into sockets in the font, and should be easily adjustable to any angle or position.

The Litany Desk.

"This has been so often included," says Mr. Micklethwaite, "in lists purporting to be of the ornaments of the second year of Edward VI., that it is mentioned here, lest it should be thought that it has been inadvertently omitted. But I cannot find any evidence of its use so early. The injunctions of 1547 ordered that immediately before High Mass the priest and others of the choir, not the priest alone, as is now the custom, should kneel in the midst of the church and there sing or say, plainly and distinctly, the Litany. This was a modification of the old procession, and the Litany itself was often called the *Procession*. Some such convenience as the desk very likely soon came into use, but the only mention of anything of the kind for many years that I know of is one entry in some churchwardens' accounts of the time of Mary belonging to the parish of Cheswardine, Salop. It runs 'for a forme to serve in procession time.' This 'forme,' I have no doubt, was a thing for the priest and others to kneel at when singing the 'procession' or Litany."

"Cousin, in 1627, as Archdeacon of the East Riding, inquires, 'Have you a little faldstool or desk with some decent carpet over it in the middle alley of your church whereto the Litany may be said.'"

The Litany desk has good authority and has become very usual. It should be large enough for two, or in large churches three, to kneel side by side, and may be covered by a cloth in the way I have suggested for the lectern.

Bells.—A parish church was provided with bells, and even the smallest had two. It would be well if this practice could be revived, as a single bell has a depressing effect.

The notice-boards on the door or in the porch are usually unsightly things. I should like to see well-designed notice-boards provided, with the permanent notices on one painted with good lettering, and the other provided with a glazed door and the notices within written by someone who has learnt to write so that they may be legible and not disagreeable to look at.

That is all that I have to say this evening about church fittings. There are several things I have not touched upon, not that they are unimportant, but because I feared to occupy too much of your time, and I am afraid that I have not been able to add anything to that which has already been said and written on this subject. My only excuse is that, in recapitulating what others have said and written very much better than I can ever hope to, I may have brought together certain considerations that ought to guide us in designing these things, and which may perhaps be useful to the younger members of the Architectural Association, whose attention so far has not been turned in this direction. I cannot, of course, suggest how these things may be made beautiful, but unless they are

beautiful, not only in design but in execution, they will be failures. Someone has well said, "Everything that nature makes is beautiful, everything that man makes should be—it is wrong if it is not."

At the conclusion of his paper, Mr. Spooner showed some interesting lantern slides of subjects referred to in his lecture.

Mr. Harry Sirt said he had great pleasure in proposing a vote of thanks to Mr. Spooner for his delightful paper. Mr. Spooner had not only given them the benefit of his own experience and opinions, but he had gathered together a vast amount of information in a very concrete form, and had mentioned various considerations which should be present when one was engaged in designing fittings for churches. If character and harmony were to be present in our churches, there were at least three considerations which should never be lost sight of. First, there must be training of mind and eye to control and direct the introduction of fittings and decoration; secondly, good artists and craftsmen must be employed with whom there must be direct intercourse; and, thirdly, the best materials must be used. A great deal could be said under each heading, but all the considerations had been well acknowledged by Mr. Spooner. He was glad the lecturer had said that he thought it unnecessary to mount a frontal on a screen. It was essentially a hanging, and, if it was properly lined, there was no reason why it should not hang and look well. Sometimes it did not look bad with a few folds showing. Everyone agreed that the altar should be of the best material, but, if they could not have much ornamentation, he thought that inlay could sometimes be used. There was a suggestion in the churchwardens' accounts of Waltham Abbey where there was mention of an old wooden altar desk which was inlaid with silver plates. As to the pew, Mr. Spooner mentioned some he had come across in Norfolk as being the best he had seen, but had he seen those at Fressingfield, in Suffolk? There was no country in Christendom where there were so many old roof screens left, although damaged, as in England. Those in the eastern counties suggest that there must have been quite a school of Flemish artists over here, and much work had been done there, of which we did not know the methods employed—a sort of gesso work. It was absolutely necessary, in his opinion, to have samples of hangings sent down to a church to find out what would be suitable. It was almost impossible to get effective work unless the hangings were put up experimentally. A roof loft might be quite meaningless now, but he thought it could be put to practical use, and, with the proper adjuncts, it made a beautiful addition to a screen. There were accounts which went to show that the roof lofts had little organs standing by the road and figures, and the priest on occasion sang part of the service standing by the road. It was hopeless to get nowadays such a font cover as that at Ufford, in Suffolk. It is a traicered canopy which goes up to the roof, and when first executed, with all its colour and gilding bright upon it, one could realise how beautiful it must have been. What then must have been the beauty of the altar surroundings? Mr. Spooner had explained the use of carpets, and Durandus (Rationale) mentions the use of cloth covers for the choir benches. At St. Peter's at Rome cloth covers were used in much the same way on occasions. Mr. F. C. Eden drew attention to two practical difficulties with which the architect had to contend—(1) the gifts of well-meaning persons. If churches were not to be flooded with the brummagem products of the ecclesiastical shops or the efforts of amateurs, the clergy must make it clear that they will accept nothing without the advice of an architect. (2) Bare brick interiors, gloomy red or grimy yellow. Such defied the utmost skill in furnishing and decoration. The coarse colour of brick killed all refinement of painted colour, and its harsh surface suggested a rude grotto, fitter to be ornamented with clinkers and oyster-shells than with refined woodwork or rich stuffs. The only remedy was plaster and white wash, thus which nothing made a more sympathetic background to delicate or sumptuous fittings. The architect must be able to distinguish between essentials and non-essentials, and so strive upon a minimum and prevent people from expending luxuries when the bare necessities of worship were lacking. The minimum of furni-

ture for a poor mission (exclusive of vestments and vessels) would be (1) an altar of stone provided with one frontal, two sets of linen, a pair of candlesticks, and a cushion for the book; (2) a reading pew; (3) a font with cover; (4) kneeling chairs for worshippers; (5) some sort of screen or pulpitory barrier between sanctuary and nave. Pulpit, lectern, organ, Litany desk, reredos, altar rails, could be added later. As to the dimensions of the altar, it was important that it should not be too narrow on grounds both of tradition and dignity. Mediaeval altars were often almost square or plain—e.g., at Xanten, 12 ft. by 7 ft.; at Arundel, 12 ft. 6 in. by 4 ft.; at St. Mark's (Baptistry), 7 ft. by 6 ft. 8 in. Nothing made so satisfactory an altar as a thick slab on a plain substructure of ashlar or brick plastered. The altar was too solemn a thing to be trifled with, therefore should be kept severely plain. The frontal was its proper ornamentation, and any permanent enrichment was seen to be misplaced during the three last days of Holy Week, when altars were stripped. Mr. Spooner, he thought, had dealt too tenderly with that obnoxious thing the altar-shelf. It lacked authority, hid the reredos, and served no useful purpose. Flowers and candles, which it was designed to support, formed no part of the decoration of altars. Certain French nuns of the XVIIIth century introduced the custom of putting nosegays upon altars, a custom deplored by learned liturgists of the time; we wanted no frivolities or effeminacies about our altars. The floor might be strewn and the walls garlanded with flowers on occasion, but vegetable matter should never be left to decay in water about the altars. The two candles pertained to service time only, and should be removed between while, just as the chalice and paten were; it being only through the laziness of sextons that they had come to be left permanently on the altar; so that people thought of them as mere ornaments, just as Dresden figures were ornaments on a mantelpiece. He considered 7 in. much too high for sanctuary steps, and recommended 4½ in. or 5 in. as more suitable. Chairs were to be preferred to fixed seats, but should never be battened together, still less screwed to the floor—a method which combined the vices of both systems and lacked the advantages of either.

Mr. C. J. Tait said that Mr. Spooner observed that the altar, even where of reasonable dimensions, lacked in appearance the importance that it deserved, and he (the speaker) understood him to urge that its importance was in a great measure proportional to the number of steps upon which it was placed. His own observation, however, led him to a contrary conclusion. The more that it was isolated, and the more its pyramidal approach was accentuated, the more its scale was reduced. Not only did he think that it gained in dignity by standing upon a broad platform, but if the top was below the level of the eye, as viewed from the nave, another dimension was added. The rival claims for the position of the organ did not come into every-day practice. A surplised choir in the chancel was universally demanded, as far as his own experience went, when any additions to the accommodation of a church were undertaken, and where the choir was the organ must be. Therefore, a chamber immediately behind the choir was rendered necessary. Nor was the sheltering of tone, provided by a chamber, an undesirable quality in the case of the average parish organ. One advantage to be gained by placing the choir in a west gallery would be the space thus gained in the chancel. Space was a necessary accessory to dignity of ceremonial, and the chancel under such circumstances might also well be shortened, thus bringing the altar within nearer view. Its present position—pushed closely against the east wall—compared ill with its older position upon the chord of the apse. Space behind the altar was, he was persuaded, eminently desirable for effect, but probably no adequate effect was to be obtained in the presence of a window situate, as custom dictates, immediately over the altar, the result being that nothing beneath it was seen with distinctness. It would seem to him neither a serious innovation nor an impracticable one were the morning chapel to be placed eastwards of the chancel, where we are accustomed to see a lady chapel. The eastern wall of the chancel could then be treated as an arcade, as was often done in the latter case, and the limitations imposed by the dead wall thereby obviated.

Mr. G. H. Fellowes Frynne said the paper

needed a good deal of careful reading in order to get hold of the main points, and the subject was a very difficult one to speak upon before a mixed audience, for the paper went somewhat beyond mere church fittings. Mr. Spooner had taken a straightforward line, and one which was not likely to give offence. Their art embraced all that is artistic, and, therefore, they must look at things in that broad way in which Mr. Spooner had done. In the main he agreed with all that Mr. Spooner had said, but there were details which allowed room for discussion. Interesting as the subject was to some, it was necessarily not so interesting to others, for there were many who did not have a chance of doing church work, and their interests lay in a different sphere of work; but surely all of them should be concerned as to the sort of churches being erected for public use, and also as to the interior fitting of them. The deplorable things which were put up and the mistakes made in the treatment of essentials and planning in church work, made one feel that there was very little study beyond just the work men were mostly engaged in—on domestic or public work, for instance. It had been his lot to be assessor in several competitions for churches, and the deplorable state of things he had had revealed to him would astound any of them. It was almost incredible to see the ignorance displayed in the very groundwork of church architecture, and which the smallest study and reading on the subject would prevent. In one case, in which there were eighty-two sets of plans sent in, and in which the premium was 20l., a competitor sent what he called a Saxon design, as he thought "that the Saxon style had not been used lately." In reference to the whole subject of church work, the great difficulty was the bishop's decision. An architect's plans had to go before the faculty, which, in many cases, was a very necessary and good thing, but in other cases, owing to the varying opinions of ecclesiastics or their chancellors, was not. Many clergymen of the past had done more damage to our churches than anyone else. He knew of one case, where a rural dean had, at the beginning of the century, condemned his own screen (a beautiful XVth century one), and had had it taken down and burnt. The next difficulty was that one had to deal with faddists—men who often thought they knew a great deal of art because they had read Bloxham or Parker on church architecture. Mr. Percy Dearmer, though one must agree with a good deal that he had written, could not be excluded, to a certain extent, from the class of faddists. The line he had taken was generally the right one, but it seemed to him (the speaker) that he made assertions on slight evidence in a most arbitrary way. As to the great question of the altar, Mr. Spooner had said that he would not advise, under any circumstances, what he would call a constructional altar, i.e., one that was itself decorated and not dependent upon a frontal. Perhaps that was so from a purely ecclesiastical point of view, but he did not think it was upheld in either the eastern or the western usage. In the country districts, it was very difficult to get frontals properly changed and attended to. A decorative or carved altar in low relief generally gave a much better effect in a church. Too often neglect was to be seen in our churches, and the altar cloth gave the appearance of neglect; there was no symbolical point in an altar cloth, and in Italian work the stone altar was used absolutely. The reredos difficulty was one of the greatest English architects had had to deal with, and in which they had too often failed. Sedding's fine designs for the reredos at Winchester had been carried out, and it was now more or less completed with something like its original beauty. He thought they might use the dossal in our churches more than it is used. It was greatly to be preferred to a poorly-carved reredos. There was great nobility about a dossal carried high enough, canopied over the altar if possible, or taking the form of a Baldachin. As regarded painters and sculptors, he thought there was a revival amongst them. When they looked back at Leighton's picture at Lyndhurst they would see that there had been an improvement since then. There were painters and sculptors now who tried to enter into the spiritual and devotional side of the art of church architecture, and the thing was to find them and encourage them. But the difficulty was that, when found, they too often had a fancy price. It was all very well to say

employ the best artists, but the price had to be considered. Architects could not put on a fancy price; they had to keep to their 5 per cent. Artists should be content with less than they asked, and that would give them an opportunity of doing more work in conjunction with architects. As to painting in tempera, he thought painting in wax was quite sufficient. In our climate tempera peeled off, and was injured by time and damp, but wax was fairly permanent. As Mr. Crace told them some time ago, the canvas should be put upon the wall properly and the wax allowed to dry on that. He disagreed absolutely as to what had been said about not raising the altar. If they had a throne, they would raise it, and so, as the chief thing in a church, the altar should be well raised. As to the altar steps and only having three steps to the sanctuary, he disagreed with that. There should be four, in his opinion, in large churches, or five, counting the communicants' step, if possible. It was symbolic. There was another difficulty in dealing with church fittings, and that was in regard to ladies who carved. He was called in the other day to design a pulpit which a lady was to carve. She got on much better than he had expected, but someone came up to her and said:—"It is very beautiful; it reminds me of something I have seen." "What?" said the lady. "A car in Sanger's Circus," was the reply. The true charm and incentive in designing church architecture and church fittings was in feeling the object for which they are designed—the glory of Almighty God—and this spirit of true worship was bound to make itself felt. It was that spirit which would bring back the past glory of our ecclesiastical art, and which gave the best work of the present time.

Mr. Geoffrey Lucas said that he was in agreement with almost all Mr. Spooner had said. The lecturer had perhaps purposely confined his attention to the practical requirements and needs of churches, but he would like to point out that those requirements and needs were traditional, and very many had their origin in remote antiquity. For this reason they were to be retained as evidence of historical continuity in the church. Particularly, for example, was this the case with the dossal and riddels, which in their origin carried us right back to the Basilican churches of early Christianity. With regard to the question of the arrangement of steps within the sanctuary, about which there seemed to be considerable variety of opinion, many steps, for a dignified treatment, required a really large chancel, a thing not often obtainable nowadays. He was personally in favour of few steps, not only for the sake of the quiet dignity resulting in the celebration of the Eucharist, but because their omission removed an element of danger in its performance and was less fatiguing to those engaged in the service. Few steps, also, gave a more unbroken floor surface for beautiful treatment, and tended to increase the spaciousness of the sanctuary. He had frequently heard it said that there could not be a celebration with priest, deacon, and sub-deacon without having three steps at the altar. This was perhaps the universal present-day arrangement in Roman Catholic churches, but he suggested that in English churches such a service could be performed with two steps, or even one. At the moment he could not recall a single old church in England which retained or showed evidence of having once had such an arrangement of steps as Mr. Spooner and Mr. Prynn recommended. They found the high altar footpace, if any existed, was longer than the altar, and the other steps were carried right across the chancel, even necessitating the sedilia seats being at different levels, giving a valuable appearance of width and a gradual ascent up to the altar level. Then, too, the steps should be low (7 in. he thought too high), and a wooden footpace afforded warmth and comfort for the celebrant. Perhaps he might say something about the font, as other speakers had confined their remarks to the sanctuary. The three general positions for fonts in English churches were in the south aisle, west of the south doorway; in an arcade, against the west side of a column or under the arch; and, more usually, in the nave, west of a line between the north and south doorways. These were all good positions, and he deprecated the hiding of the font in a built-out baptistery. Such an arrangement was rarely carried out on a large enough scale to be successful, and frequently formed an ugly, fussy excrescence on the exterior.

He would like to see the font boldly raised up, furnished with a cover, fitted with a lock, and with plenty of free floor space surrounding it. The font steps might be steep, as they partake of the nature of a stand for a sacred object. The priest, too, not having to leave the font till after the completion of the baptismal rite and provided with plenty of space to stand on, would not feel any discomfort from them. He had never seen a font provided with a removable brass book-desk fitting into sockets, as suggested by Mr. Spooner. It savoured too much of screws and mechanism—a thing to be avoided in church fittings. Personally, he would like to banish most of the brass desks found in English churches and replace them with cushions. They were mostly harsh, unlovely things. If a desk at the font was necessary, could it not be a light movable wood lectern? With regard to the pulpit, from even an artistic and useful standpoint, it should stand clear of the east responds of the nave, but it was certainly better one bay down the nave. In the former position it interfered with the balance of the chancel arch and screen, and the parson preached "at" rather than "to" his flock. Everything should be done to increase the feeling of ease in the preacher, and so induce fluency of speech. He should have plenty of room for gesticulation, and, for safety, the pulpit, particularly if small, should have a door. Cranmer's pulpit, at Westminster, had one. The brass candlesticks commonly found on the top of the pulpit should be swept away (they probably did more than anything else to cause discomfort to a preacher), and some other means of lighting the pulpit employed. A safe place provided for the speaker's watch, if there was not, as there should be, a clock in the church, was a necessity. If the top of the pulpit was wide and sloped inwards, it improved its appearance; in such a case a cushion was better than the customary brass desk, as it could be adjusted in height by the speaker, and had ancient usage to back it up. A sounding board or canopy, either hung out from the wall or supported by the pulpit, provided a nice finish and added great dignity, but the whole thing was spoiled if too much importance was given to the pulpit steps. Mr. Spooner's suggestion for carrying the rood screen right up without any structural arch and of incorporating the rood into a more architectural whole with the screen was good; but, instead of saying "gates may be added," he would say "gates must be added." The principal object of a screen was to exclude people (and stray animals) from the choir; out of service time it had the additional weighty artistic values of giving length, mystery, and beauty, but to leave out the gates was to defeat the primary object and was illogical. Still, a screen without gates was better than no screen at all; they could be added later, if provided for at the start. He thought that the chancels of English churches were often too much filled up with furniture, particularly in the English cathedrals. The front desks of the stalls should be kept as far apart as the chancel allowed, but, he suggested, the back row of the stalls should certainly be well raised above the front seats. This gave a dignified appearance to the stalls, both when occupied and unoccupied. Altar railings and gates were a late introduction, and were useful, when the chancel screens were temporarily done away with, in protecting the altar from profanation. With a properly enclosed chancel they were not necessary, though small movable kneeling benches for infirm communicants were so. The telescopic and other mechanical devices for modern altar rails should be sedulously avoided. He thought the little desks and many chairs frequently found in the sanctuary should be abolished. On the north side was usually found the bishop's stool, which ought not to be occupied by the vicar of the church, and might very well be a folding one, brought out and covered with a rich cloth when the bishop was present. The really permanent seats were the sedilia for the priest, deacon, and sub-deacon; any other seats required for the attendants should be as unobtrusive as possible, as they were concessions to human frailty.

The President, in putting the vote of thanks to the meeting, said it was interesting to have a practical paper of that kind from one who had gone so deeply into the subject. In many of our old country churches, the east end was deplorably bald and uninteresting, and the window being low down behind the altar, one saw nothing but a patch of light. The old

windows were generally about 5 ft. or 6 ft. high, and he would like to know from the lecturer how the space over the altar was treated. In our modern churches it would be seen how much better it was to have the windows on either side, concentrating the light on the reredos, which could be seen distinctly all the way down the church. As to materials, Mr. Spooner said stone, metal, or wood could be used, or all together, for screens. He (the speaker) thought that was where there had been so many failures in church fittings—that too many materials had been combined in one thing. To mix up wood, stone, and metal was a great mistake in his opinion, and it applied especially to the pulpit. He did not think it was desirable to use mosaic about the altar, unless as part of a general scheme of decoration. He thought Mr. Spooner had made one admirable suggestion, and that was that, if they were doing simple and inexpensive work, why not honestly paint and varnish the seats? Why it should have become the accepted tradition that varnished deal or pitch-pine should alone be used, he did not know. On the Continent, the fittings and seats were often painted dull grey or drab colour, and he could not see why we should not do so. As to the old screens, etc., still left in this country, many of them were extremely beautiful, and he was glad we still had some left; but he thought that these churches and fittings should be put under national control and protection. It was scandalous that the clergy should have the power to remove fittings, etc., at will while they held office. Nothing should be removed unless a church had to be enlarged to suit the needs of some growing parish, but where fittings told of the history of the parish they should not be removed without very good cause.

The vote of thanks, in which was included thanks to the Board of Education for lending lantern slides for the occasion, having been heartily agreed to,

Mr. Spooner, in reply, said the President's question of how the space over the altar was treated in mediæval churches could not be answered shortly. It was treated in a great many ways. One way was to be seen in the church at Kersey, in Suffolk, where the reredos was formed of niches and canopy work right across the window between the internal jambs, reaching up to perhaps one-third of the height of it, and hiding a great deal of the window. Many fragments remained in the church, but the whole thing had been broken down. People at that time did not demand a vista, and they did not mind hiding good work they did for the glory of God. And he thought they did not know what clever work they did. No doubt they filled their windows with beautiful stained glass and put an elaborate reredos in front of that much of the glass could not be seen. A dossal cloth was constantly used, no doubt, at different heights. He did not know how people behaved in church in mediæval days, but he supposed very much in the way they did now in French villages. In many of the churches of Italy and France to the present day—not so much in the large towns, perhaps—people went into any part of a church they liked; and probably in England in the Middle Ages, if people wanted to see behind the reredos of the altar they walked round. Undoubtedly, painted wooden screens were put up at the back of the altar, and reference was made to such screens in the "Rites of Durham," a most interesting book, which gave much light on the arrangement of the cathedral. He agreed with the President against the use of many materials in screens. It was only those who had great experience who could do so with success, but he advised most people to use only one. As to what Mr. Prynn said about altar steps, that was a question for ritualists. With more than three steps, however, the deacon and sub-deacon, who constantly stepped backwards, were running some risks. The question of tempera or oil paint would take too long to discuss. Tempera was a term which covered a great deal. Ordinary distemper laid on a ceiling was tempera, but he spoke of the egg medium which, laid on a proper gesso ground, was extremely durable, and had the most beautiful quality of any medium with which he was acquainted. His objection to oil paint was that, although it looked nice when new, it got hard and horny in most cases, and he thought it was difficult to get the same clearness and freshness of colour that could be obtained with tempera. He was glad that Mr. Prynn thought that some of our sculptors were turning more attention to

decorative art. The only one he could think of was Mr. Brampton, and, much as he admired his work, he had not so far seen any which seemed suitable for church decorations. It was true that some painters asked absurdly high prices for their work, but in their earlier days they could be got for prices which were not too high. They should impress on their clients that when painting was to be done it should be done by an artist. Most modern church paintings were bad copies of mediæval work, with all its ignorance and none of its merits. It was quite devoid of thought or anything else which made a work of art.

The Chairman announced that the next meeting would be held on February 24, when Mr. P. J. Osborne Smith would read a paper on "Country Houses and Accessory Buildings." The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

The eighth meeting of the section was held at 18, Fulton-street, Westminster, on the 16th inst., when Mr. J. B. Fulton read a paper upon the use of the axial line in planning. The following is a summary of it:—

In commencing, the speaker thought that the use of the axial line was perhaps the first necessity in good planning if one desired a dignified and grandiose effect, and a knowledge of the use of this line was of the greatest importance.

Mr. Fulton by means of plans, etc., and sketch plans upon the blackboard, explained his remarks in detail. It was the complete grasp of the uses of this line which enabled the Egyptians to obtain such grandiose effects, and the Greeks and Romans equally understood its merits. In St. Sophia at Constantinople we have the principle carried to a great height of excellence. The buildings of the Gothic and Renaissance also furnished an endless number of examples. Taking the work of any celebrated architect from St. Peter's at Rome, by Michael Angelo, to St. Paul's Cathedral, by Sir Christopher Wren, this root idea is clearly seen. As to modern public buildings, Mr. Fulton spoke in enthusiastic terms of the grandiose examples of Paris and Vienna, especially the latter, where the use of this line is so well understood and appreciated. He thought if the use of the axial line was found impossible in planning a building, then the site must be a bad one. Lastly, as to domestic buildings; the Greeks, as also the Romans and other cultured nations of the past, have shown clearly, by data remaining, that even in their home-life they appreciated the use of the axial line, and yet to-day we, as a nation, were living in houses where this idea is completely disregarded in planning, and he pleaded for its employment.

Mr. A. S. Taylor proposed a vote of thanks to Mr. Fulton for his paper. This was seconded by Mr. A. H. Belcher, and supported by Messrs. D. A. Forster, F. Lishman, F. C. Mears, and the Chairman (Mr. H. Gregory Collins), and the following is a brief résumé of the points discussed:—

Practical unanimity existed as to the desirability of the use of the axial line in the case of ecclesiastical and public buildings, but some difference of opinion seemed to be shown as regarded the question of domestic work. A considerable number of examples of the successful use of the principle were cited, that most in the public eye at present being the new professional road in the Mall by Sir Aston Webb. The fine effect of the sweeping line of Regent-street was another example called attention to, but it was not made clear by the speaker if this was intended as an example of a curved axial line. The Royal Courts of Justice in the Strand were also criticised, and the same speaker thought that in view of certain examples he knew of abroad, an entrance not on an axial line had, in some cases, a distinct advantage. As having reference to domestic work one speaker, in supporting his disagreement as to the desirability of using this line, spoke of the pleasure a visit to Mr. Norman Shaw's house had given him, and he also expressed his liking for the manner in which the estate known as Turnham Green has been laid out, though he did not go so far as to desire a state of things where one lost himself in a wood of domestic architecture.

Regret (which was generally shared) was expressed by one member that Mr. Fulton had not shown them any examples that evening from Vienna, and this speaker thought that it was most necessary to defend ourselves against

false axial lines, but did not define quite what these might be. One speaker, whose remarks met with acceptance by the Special Visitor, thought that the value of St. Paul's as a complete conception lay in the fact that it was, so to speak, detached from the approach by Ludgate Hill.

Love of order, another speaker thought, had produced the idea of the axial line, and this speaker expressed regret that in the new Mall that part of the scheme which appertains to the statue of Queen Victoria and its adjuncts, would necessitate the winding round it of any procession, thus marring its spectacular and processional effect.

Mr. H. H. Statham, who attended as Special Visitor, then summed up the discussion. He said the subject was one that had always interested him. He remembered a story of the late Mr. Nesfield being shown a plan by a former pupil for criticism, when he said, "Draw a line down the centre of a fresh sheet of paper, and form your plan on that." The axial line was valuable in giving a controlling principle to a plan, especially when composed of numerous apartments for various uses. The axial principle was recognised by the French as of great importance in setting lines of streets and buildings; in England it was much neglected; even the Albert Hall and Albert Memorial, built in connexion with the same object, were out of axis. St. Paul's being out of centre with Ludgate Hill was perhaps just as well, considering the inferior architectural character of the street. The curved axial line mentioned by Mr. Fulton was exemplified in Inigo Jones's splendid plan for Whitehall Palace, where the approach to the Royal reception-rooms was round one or other side of a circular corridor. Plans were more easy to find one's way about if axially laid out, at least as to the main lines. Attempt at exact architectural balance sometimes led to difficulties, as in the case of Blenheim, where the chapel in one wing was balanced by the kitchen on the other. Had it been the library instead of the kitchen—earthly wisdom on one side and heavenly wisdom on the other, it would have been suitable enough. In regard to the Acropolis, where the temples, each axial in itself, were set at various angles, they were probably orientated to some special star or the sunrise on a special day, so that it might be said that the ordinary axial system was only neglected for a higher one. He did not think any architect ought to complain of an irregular site; such a site, rightly considered, was full of suggestion; and in regard to the remark that had been made that if a site could not be treated axially it was not a fit site, he thought it was the business of the architect to force the building into shape and to make the site a fit one. In regard to houses on a smaller scale, it might be a question whether you could always apply the axial system. In a small house there was some advantage in being able, as it were, to lose yourself a little in it. But it should always have some systematic plan, some definite shape and system, otherwise it was no better, architecturally, than a rather more elaborate hut. He would recall a remark in Ibsen's "The Master-BUILDER" (which ought to have been translated "The Architect," for that was the meaning of the title in the original), when Mr. Solness was told that a certain young couple were in a hurry to have their house built, "If all they want is a roof over their heads, of course they can have that at once; but if they want what I mean by a house, they must wait till it has been thought out."

WESLEYAN MISSION HALL, EAST HAM.—A fund is to be opened for the erection, at an estimated outlay of 20,000*l.*, of mission buildings upon a site adjoining the Town Hall. The project comprises a mission hall, with a capacity for 2,000 persons, and school accommodation for 1,400 children.

PUBLIC LIBRARY, INNERLEITHEN, N.B.—The free library at Innerleithen was opened on the 11th inst. The building, which is situated in Buccleuch-street, is of two stories, containing a lending library, reading-room, and committee-room on the ground floor, and a lecture hall and librarian's house on the upper floor. The front of the building is of hewn freestone facings and ashlar, while the sides and back are built of bricks, plastered with cement and rough-cast. Mr. P. L. Henderson was the architect of the building.

THE LONDON MASTER BUILDERS' ASSOCIATION.

THE annual dinner of the London Master Builders' Association was held on Wednesday in the Empire Hall, Treaders Restaurant, Piccadilly, W., Mr. James Carmichael, President, in the chair, when a presentation was made to Mr. J. Howard Colls in recognition of his services to the profession in carrying the case of "The Home and Colonial Stores v. Colls" to the House of Lords. There were also present at the dinner Sir J. C. Bell; Mr. J. Williams Bann, M.P., Chairman of the London County Council; Mr. E. Guy Dawber, President of the Architectural Association; W. Downs, President, Builders' Benevolent Institution; Mr. W. Shepherd, President, National Federation of Master Builders; Mr. C. H. Barnsley, President, Institute of Builders; C. Kerridge, President, Eastern Counties' Federation; W. F. Wallis, President Southern Counties' Federation; Walter Lawrance, President, Quantity Surveyors' Association; and Messrs. A. C. Bulmer Booth, E. J. Brown, W. J. Burrows, J. Howard Colls, S. Collins, L.C.C., F. L. Dove, F. J. Dove, W. Eckstein, A. Franklin, E. Flint, G. L. Gomme, Clerk to the L.C.C., T. Gregory, E. A. Gruning, J. S. Gibson, R. H. Hale, J. Hamilton, H. T. Hare, R. S. Henshaw, F. Higgs, F. B. Hollis, H. Holloway, E. B. Anson, G. R. Julian, W. J. Locke, O. L. Leigh Clare, M.P., J. W. Lorden, J.P., W. Lawrance, D. W. McInnes, Ellis Marsland, F. May, L. J. Mayne, F. A. Murray, R.A., C. H. Fellowes Pryme, F. A. Powell, Guy M. Nicholson, H. Neal, H. Northcroft, A. N. Prentice, J. Randall, W. E. Riley, Architect to the L.C.C., Alex. Ritchie, J.P., J. W. Simpson, G. Sherrin, H. H. Statham, A. R. Stenning, T. Stirling, E. White, L.C.C., C. Wall, F. E. Williams, H. Winstanley, S. Young, T. Costigan, secretary, and others, the total number of members and guests being about 250.

The loyal and patriotic toasts having been honoured (Mr. C. H. Barnsley proposing and Colonel S. Cargill responding to "The Imperial Forces").

Mr. H. Holloway, J.P., proposed "The Imperial Parliament and Public Bodies," coupled with the names of Mr. O. L. Leigh Clare, M.P., and Mr. J. Williams Bann, M.P., Chairman of the L.C.C. It might be asked, what had these bodies done for builders? Well, they had given them the Employers' Liability Act, Income Tax, Building Acts, and what was still worse, Building Act Amendment Bills, and a good catalogue of such enactments. The L.C.C. was very much alive, and though it was greatly abused, his experience with them had not been a bad one, for he had never worked for a better employer. They had heard a good deal lately about Paris in London, and it had just been suggested to him that London might go to Paris and take a hint in regard to its County Hall in the form of a Hôtel de Ville. Trade was bad in London and the builders of London would be glad to compete for the erection of a County Hall for London.

Mr. Leigh Clare, M.P., in response, said that the House of Lords, at the instigation of their guest that evening, Mr. Colls, had done a great deal of good work for London and for the building trade. He hoped that the changes in regard to the law of light would be to the advantage of London. Until Mr. Colls had the courage to take his case to the House of Lords, things had got into a deplorable state of affairs. Anyone who had a house to build in London was at the mercy of those who had a house with a twopenny-halfpenny window in it, and the law of light afforded opportunities for the worst kind of blackmailing. The law had now been put on a sensible basis, and they were very much indebted to the House of Lords.

Mr. Williams Bann, M.P., in reply, said he felt like Daniel in the lions' den, and that, as Chairman of the London County Council, it was a perilous thing to come among them. He could imagine someone getting up and speaking of the monstrous conditions of contract, and the still more monstrous Act of 1894, and the recent Amendment Bill. His answer was that the London County Council was what they made it; it was the creature of its environment, and they were the environment. While he was perfectly certain the London County Council made many mistakes, they had the advantage of candid and capable criticism, and they were always glad to hear the other side. In the endeavour to make streets wider, factories safer, and do everything they could for

the safety of life of the citizens, the London County Council was always glad of the invaluable experience and criticism of such men as he saw before him. He frequently stood and admired buildings of the day, and he thought that Macaulay's New Zealander would come to the conclusion that there were great builders in these days. In helping to build a better and brighter London, and in providing houses for workmen they were doing what they could to chase away disease and reduce the death-rate, and he wished them and their Association every prosperity.

The Chairman, in presenting Mr. J. Howard Colls with his portrait, said that the Association had been in existence about thirty years, and during that time its membership had included practically all the principal builders of London. The Association was never in a stronger position than it is to-day, either numerically or financially, and never was it a stronger power to be reckoned with in maintaining the just rights and privileges of employers. But their interests as an Association and as individuals were wider and broader than this. They were deeply interested in the laws of this mighty empire, and they recognised that they had a duty to perform in regard to them not only to the Association, but to their fellow-citizens. Actuated by this motive, one of their members had carved for himself a niche in the temple of Fame which had received universal approbation, and for which they as an Association owed a deep debt of gratitude. Needless to say, he referred to their friend, Mr. J. Howard Colls, who, by his clear-sighted foresight and tenacity of purpose, carried his now famous case, *Colls v. Home and Colonial Stores*, from the Appeal Court to the House of Lords, regardless of expense, and obtained an important decision in his favour—a decision which would be of incomparable benefit to property owners in towns and cities, and especially in London. The members of the Association felt that they would be sadly lacking in appreciation of the importance of the event were they to allow the case to pass into history without some slight recognition. Accordingly, they unanimously decided to present Mr. Colls with his portrait, painted by one of the leading artists of the day, i.e., Mr. Orchardson. They were all justly proud of the portrait, and he had not the slightest doubt it would be esteemed by the family and handed down as a heirloom to future generations.

Mr. Carmichael, in a few well-chosen words, then presented the portrait to Mr. Colls.

Mr. Colls, in reply, said he had been accustomed for many years past to receive all sorts of kindness from his brother builders, but he never could have expected such a mark of their esteem as that he had just received, had it not been for the fact that, by a happy accident, he had been able to do something which in their opinion had been of service to the trade. Having briefly given the history of the case of *Colls v. Home and Colonial Stores*, Mr. Colls said he was never more thankful in his life than when the House of Lords gave their decision. How he was to thank them for that valuable portrait he did not know; the picture would be a joy to him and to those who followed him, and he should always feel thankful to them for their kindness in giving him that mark of their esteem.

Mr. E. White, L.C.C., then proposed the toast of "The London Master Builders' Association and its President." There was an impression at Spring-gardens that the object of the Association was to form a ring with a view to enhance prices, and he had endeavoured to combat that view for some time past. The motto of the Association was "Defence, not Defiance," and amongst its objects were the settlement of questions between masters and men; the interchange of opinion amongst the members; the assistance of members in trade disputes, etc., and he did not think anyone could take exception to any of those objects. In his early days, when there was no such Association, master builders were very much at the mercy of combinations of workmen, and strikes were resorted to very frequently; but now, since the masters had combined, difficulties between masters and men were settled in a much more sensible way. He congratulated them on the strength of the Association, but thought it rather a reproach that comparatively few of the builders of London belonged to the Association.

The Chairman, who was received with

musical honours, said his year of office was nearly over, and any little success he had achieved was largely due to the hearty support he had received from the officers and members of the Association. As to their indefatigable secretary, Mr. Costigan, he did not know how to thank him for what he had done. The Association was in a healthy state; never were the Council meetings better attended than they had been during the past year, and there had been a keen and growing interest manifested in all the affairs of the Association by the members. The past year had been a comparatively uneventful one, as there were no labour troubles, but good work had been done, as was seen from the annual report, and a great deal of valuable time had been given to the affairs of the Association by the Council and committees. They would heartily welcome any builders present who were not members who wished to join them. He hoped they would not put it off, as he did, thinking there were no advantages to be gained from membership. Having the assistance and benefits of the Association he hoped all master builders would join. He was glad to see the Chairman of the London County Council with them that night, and he hoped that Mr. Benn's action would be followed by succeeding chairmen.

Mr. F. Higgs, in the absence of Mr. T. F. Rider, then proposed "The National Federation of Building Trades Employers." Some of them had not, in years gone by, thought much of the Federation, because they did not know much about it. It was the body corporate of which the Association was but a unit, and when the organisation of the trade was brought to perfection they would be prouder of the Federation than they were of membership of their own body. The Federation was endeavouring to set aside reserve funds for helping subsidiary units.

Mr. William Shepherd, President of the National Federation, replied. The Federation was purely defensive in its character. The larger and more comprehensive the associations were, the more likely were they to give effect to any general principles which had to be taken into consideration in the relations of masters and men, and the existence of these Federated Associations had conducted to a better understanding between the two interests.

Mr. Alexander Ritchie, J.P., having suitably proposed "The Architects and Surveyors,"

Mr. E. Guy Dawber briefly replied for the architects. He said he did not think that the reproach was at all deserved that in building and construction we were behind the Americans, for in London and the provinces there was evidence of the skill and ability of architects and builders. Architects and builders had unique opportunities in London at the present time. Important improvements were being carried out, and it was to be hoped that the authorities would realise their responsibilities, and if they did they would find that the architects would not be behindhand in seconding their efforts.

Mr. Walter Lawrance, who responded for the surveyors, said they could help surveyors in three ways. As contractors they could refuse to tender for buildings without quantities; secondly, they could return those rubbishy things sometimes sent to them called bills of quantities; and thirdly, and most important to quantity surveyors, they could use their influence to see that the various councils and authorities appreciate the services of professional men, and did not cut down charges to such a low figure as was at present done.

The remaining toast was "The Visitors," proposed by Mr. E. J. Brown, and seconded by Mr. David Murray, R.A.

THE BRITISH FIRE-PREVENTION COMMITTEE.—The tests next on the list are in respect of three wired glass casements by Messrs. Pilkington Brothers (being their third test); a 24-in. partition by the Adamant Company (being their second test); a partition by the Asbestos Brick and Tile Company; a concrete floor, with broad-flange girders, provided by Messrs. Skelton & Co.; and an automatic fire-alarm system by the Danish Autophosphore Company. The Committee has just issued the report on the Special Commission which attended the Budapest Fire Congress. A report will be shortly issued on a 24-in. plastic partition of Messrs. Gust & Co., also a report on three electric-glazed basements of the British Luxfer Prism Syndicate. The next series of tests are to take place on Wednesday, March 8.

Fifty Years Ago.

THE LONDON 'CHANGE.—Can you do nothing to help the attenders at 'Change in their sufferings from the unprotected condition of their place of meeting? It is really very hard that the merchants of the first city in the world cannot have—I will not say a comfortable place to meet in—but one that affords the mere shelter from wind and rain; the area, as you are aware, is open to the sky, and if you take shelter in the "cloisters," there is an attack of bronchitis behind every pillar. It is a fact that some of our leading men absent themselves from 'Change on this account; but for some of us, who must either look out for business or perish in the attempt, it is a serious business. Surely, a glass roof is not beyond the wealth and enterprise of the merchants of London.—A STARVED BROKER.—*The Builder*, February 24, 1855.

Illustrations.

END OF THE TIBERINE ISLAND: FROM PIRANESI.

THIS is a reproduction from one of Piranesi's bold and powerful engravings of ancient Roman remains, and is given as a part illustration of the first article in this issue. Since Piranesi's plate was reproduced we have been indebted to Miss Charles for a photograph, printed in connexion with the article, which shows the same work at a recent date and from another point of view.

The following is the translation of the inscription in Italian under Piranesi's plate.

"View of part of the ship built of travertine, in front of the substructure which supports the Temple of Esculapius on the island of the Tiber. This ruin exists to-day at one extremity of the island, under the little courtyard of the Convent of the Fathers of S. Bartolomeo."

Many antiquarians have erroneously imagined that the whole island was shaped like a ship; this is not possible, because, if we take the proportion of this ruin, the whole island would have been half the size of a galley to-day.

A.—Rostra of the poop, now in ruins.

B.—Bust of Esculapius; his face has been corroded by time, and he holds a rod round which a serpent entwined. This seems to allude to the correspondence of the statue in the form of a serpent. It was brought on a ship by Romans who had been sent by the Oracle to fetch it from Epidaurus. This was done in order to arrest the plague which was then afflicting them at that time.

D.—Opening for the cars.

F.—Hull of the ship, which is raised on a basement of peperino.

G.—Substructure of the Temple.

H.—Ruins of the same heaped on it."

The reference letters are not all obvious on the plate, but the description is sufficiently intelligible.

DESIGN FOR A WINTER GARDEN.

THIS is the design which obtained for its author, Mr. J. A. M. Hunter, the Grissell medal of the Institute of Architects this year. We give the perspective view and one of the sheets of constructional details. The Grissell medal, we may remind our readers, was specially founded to promote the study of construction.

The author sends us the following notes in explanation of his intention in the design.

"The conditions issued by the R.I.B.A. for a winter garden in glass and iron required: dome in the centre, 30 ft. to 40 ft. in diameter; in area nearly equal to one-half the total area given. Taking the building as a square, spaces 10 ft. to 15 ft. wide along each side remain to be treated; these spaces have been utilised for galleries, etc.

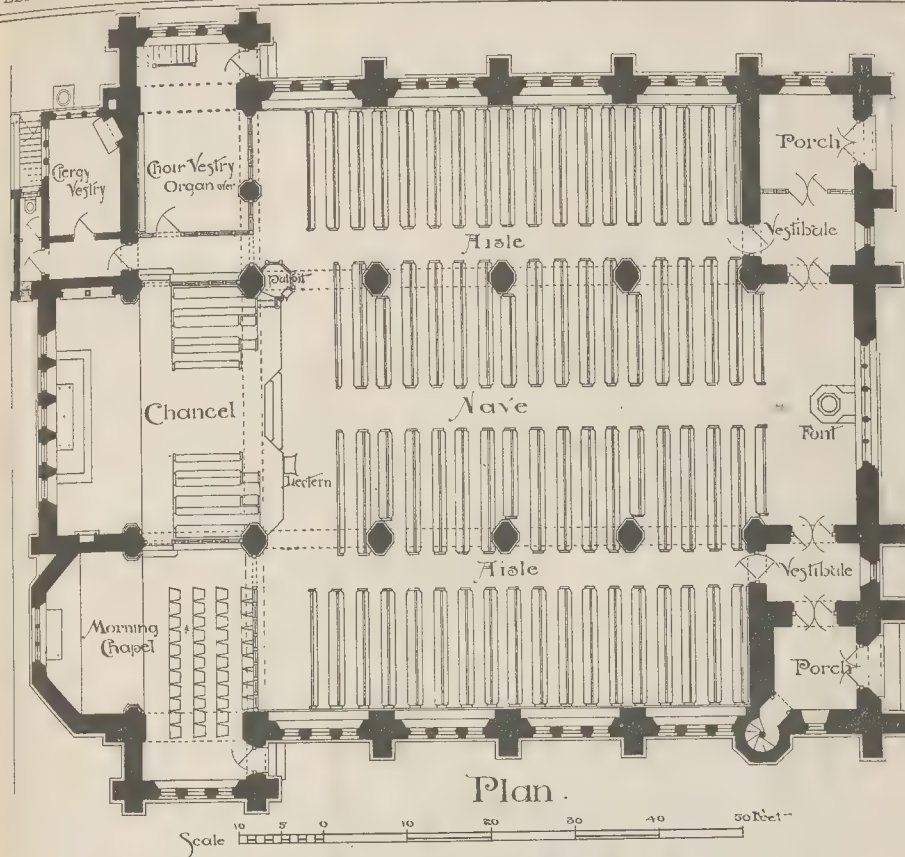
This winter garden has been designed for the actual growing of palms and plants rather than as an ornamental reception-room for dancing or other functions, and is intended to be the central feature of a formal garden situated in a public or private park.

Internally everything has been left perfectly plain, all constructional work being exposed and the whole painted ivory white.

A feature has been made of the eight large ribs carried down as piers; on these the whole structure depends.

All caps, bases, arches, etc., are formed entirely of simple rolled steel sections and flat bars, cast-iron being only sparingly used for outside work.

Externally a feeling of solidity rather than lightness has been aimed at; the solid corner towers have been designed to produce this effect and at the same time to break the monotony of a large expanse of glass without detracting seriously from the actual lighting area."



Church of St. James, Ealing. Plan.

CHURCH OF ST. JAMES, EALING.

The first portion of this church as shown on the plate (which is taken from a photograph) was completed last year. There remains to be built the chancel vestries for clergy and choir, and the tower and spire. The plan shows the church as it will be when finished. Owing to the shallowness of the site the church had to be planned unusually wide for its length, to provide the required number of sittings. The nave is 29 ft. wide between the arcade walls, and the north and south aisles are each 19 ft. 6 in. wide. The chancel and nave will be of equal width and height and 98 ft. long.

The walls and nave arcade piers are faced with Bracknell red bricks. The arches of the chancel and nave arcades are of Bath stone, and the external stonework is executed in Kinton stone. The roofs are covered with green slates.

Messrs. Goddard & Sons, of Farnham and Dorking, were the general contractors, and Mr. William Pywell the architect.

NEW INSURANCE OFFICES, NORWICH.

The illustration shows the building recently erected at Norwich as the Head Offices of the Norwich and London Accident Insurance Association.

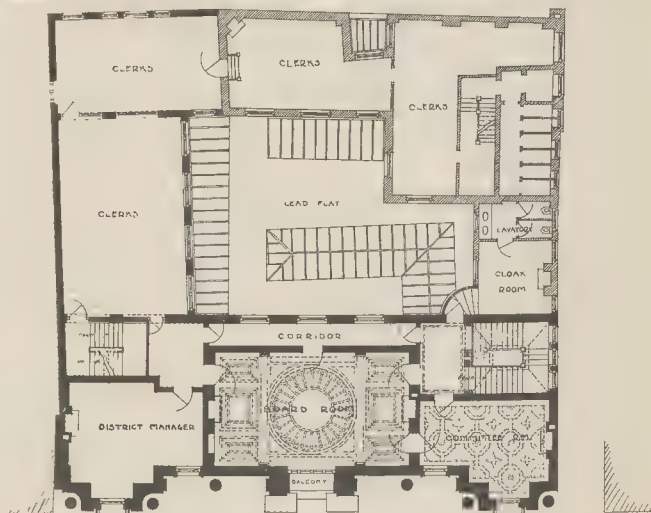
Property adjoining the existing offices was acquired, and the façade has been carried out in two portions, one to be furnished before the other was commenced, so as to avoid interruption of the business of the Association.

The two plans show the general arrangement of the building. The entrance-hall and corridor are panelled in oak and with oak columns and marble floor. The directors' staircase will also be in oak, with oak panelling on the walls. The board-room, on the first floor, is decorated with carved wood panels and an ornamental plaster ceiling; the lighting from the street

front is by a single window, which is well recessed so as to secure for this room quietness from the passing traffic. The room will also be lighted by a dome light reaching through the second floor.

Externally the offices will be built of Monks'

Park and Portland stone—Monks' Park being used in the sheltered parts, and Portland in the exposed parts of the building. A granite base runs along the whole front, and from this base the design consists of a colonnaded treatment in the Doric order, running through two



Norwich and London Accident Insurance Offices. First Floor Plan.

Sir W. B. Richmond has put the following notice of motion upon the agenda paper:—

That a Special Committee be appointed, which shall be designated "The Improvements Reference Committee," whose duty it shall be to advise the Council upon all proposals involving permanent or constructive work, or designs in the selection of which artistic knowledge and taste are requisite. The Committee do consist of the under-mentioned persons:—The President of the Royal Academy; the President of the Royal Institute of British Architects; the President of the Society of Antiquaries; Mr. Brock, R.A., sculptor; Mr. Prang, C.E. Engineer; Mr. Jackson, R.A., architect; Mr. R. B. Marshall, A.R.A., architect; Sir Lawrence Mr. R. B. Marshall, A.R.A., painter; the Right Hon. the Earl of Carlisle; the Right Hon. Lord Windsor; Lord Balfour.

To That it be referred to the General Purposes Committee to prepare and submit to the Council for approval an order of reference to the Committee.

Churchyards and Small Gardens.—Last week, the Parks and Open Spaces Committee recommended, and it was agreed, that Carlton-square garden, Mile-end; Christchurch-garden, Spitalfields; Limehouse-churchyard; St. Andrew's (Holy Trinity) churchyard; St. Andrew's (St. Paul's) churchyard; Spa-fields; playground, Clerkenwell; St. Bartholomew's-churchyard, Bethnal-green; and Stepney-churchyard, be maintained by the Council until March 31, 1906, and that previously to that date the question of continuing their maintenance be again considered by the Council.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

North.—Buildings on the northern and southern sides of Cassiot-road, the northern side of Eawyn-road, and the western side of Church-lane, and the completion of a building on the northern side of Cassiot-road abutting also upon the eastern side of Cassiot-road (Mr. W. Bartholomew).—Consent.

Clapham.—Eleven houses with bay-windows on the east side of Park Hill, Clapham, between "Lyndhurst" and "Sandgate" (Mr. H. J. Cope).—Consent.

Leam.—A one-story addition upon part of the forecourt of "Mayfield," No. 65, Perry-street, Leamington, abutting also upon Church-street (Mr. W. M. Proudfoot for the Forest Hill Brewery Company, Ltd.).—Consent.

Finsbury, Central.—One-story shops upon part of the forecourts of Nos. 39 and 41, Pen street, Finsbury (Mr. T. H. Watson for Mr. H. Vincent).—Consent.

Leamington.—The application of Messrs. Whitfield & Thomas for the Rev. E. N. Sharpe for an extension of the period within which the erection of mission buildings on the site of Nos. 3 and 10, Broomsleigh-road, West Hamstead, abutting also upon Dornell-street, was required to be commenced and completed be granted.—Agreed.

Leamington, North.—An alteration to the one-story shops at Nos. 59 and 60, Lower-marsh, Lambeth (Messrs. Boots, Ltd.).—Consent.

Leamington.—A projecting clock at premises on the south side of Brownhill-road, Catford, toward of Laleham road (Major C. S. Barton for Messrs. Sainsbury Brothers).—Consent.

Leamington.—A porch to a house in course of erection on the east side of Vicar's-hill, Ladywell, southward of No. 48 (Mr. A. Roberts for Mr. T. Parry, jun.).—Consent.

Leamington, East.—A porch at No. 33, Finsbury-road, St. Marylebone (Messrs. Ascham & Ringland for Mrs. Lupton).—Consent.

Leamington, East.—Buildings upon a site abutting upon the northern side of Albert-road, the eastern side of Avenue road, and the northern side of St. Edmund's-terrace, St. Marylebone (Mr. A. F. Faulkner for Mr. W. W. Hunt).—Consent.

Leamington, South.—A deviation from the plans approved for the erection of iron and glass shelters to a theatre building abutting upon the east side of Charlotte-street, the east side of Tottenham-street, and the north side of Pitt-street, St. Pancras, so far as relates to the shelter erected over the Charlotte-street entrance to the theatre, overhanging the public way 3 in. more than shown on the plans (Mr. F. T. Verity for Mr. E. D. Mandick).—Consent.

Leamington.—The retention of a building on the north side of Charlton-road, Greenwich,

abutting upon the east side of Sherington-road (Mr. J. Johnson).—Consent.

Hampstead.—Buildings upon the site of Nos. 156, 158, and 160, High-road, Kilburn (Mr. G. A. Sexton for Mr. B. B. Evans).—Refused.

Dulwich.—Buildings at the rear of No. 117, Lordship-lane, Dulwich, to abut upon Shawbury-road (Messrs. H. Wakeford & Sons for Mr. W. Morton).—Refused.

Hammersmith.—A one-story building at the rear of No. 25, Kenmont-terrace, Harrow-road, Hammersmith, to abut upon Letchford-gardens (Mr. G. A. Sexton for Mr. Winter).—Refused.

Paddington, North.—A one-story addition at the rear of Nos. 480 and 482, Harrow-road, Paddington, to abut upon Fernhead-road (Mr. R. H. Kerr for Mr. J. Alexander).—Refused.

Width of Way.

Camberwell, North.—Buildings at No. 80, South-street, Camberwell, with external walls at less than the prescribed distance from the centres of the roadways of South-street and Little South-street (Mr. J. J. Freeland for Messrs. J. Taylor & Sons).—Consent.

Hackney, South.—A one-story building at the rear of No. 107, High-street, Homerton, with external walls at less than the prescribed distance from the centre of the roadway of Belshaw-street (Mr. W. E. Park for Mr. G. M. Hildyard).—Refused.

Width of Way and Lines of Frontage.

Kensington, South.—The retention of buildings erected over the District Railway on the eastern side of Earl's Court-road, Kensington, abutting also upon Hogarth-road and Earl's Court-gardens (Mr. G. Estall for the Metropolitan District Railway).—Consent.

Hackney, North.—Five houses with bay-windows on the northern side of Harrington-hill, Hackney, to abut also upon Ivy-terrace (Mr. W. Stone for Mr. J. L. Siggins).—Refused.

Strand.—A porch at the Surrey Restaurant, Surrey-street, Strand (Messrs. Wilson & Long for Mr. J. E. Smith).—Refused.

Lines of Frontage, Means of Escape from the Tops of High Buildings, and Construction.

St. George, Hanover-square.—Projecting balconies on the Berkeley-street frontage of No. 33, Dover-street, Piccadilly (Mr. J. S. Gibson for Messrs. Borough House, Ltd.).—Consent.

St. George, Hanover-square.—Means of escape, in case of fire, proposed to be provided in pursuance of section 65 of the Act, on the fourth and fifth stories of the rear block of No. 33, Dover-street, Piccadilly, abutting upon Berkeley-street (Mr. J. S. Gibson for Messrs. Borough House, Ltd.).—Refused.

Formation of Streets.

Leamington.—That an order be issued to Mr. P. Morle sanctioning the formation or laying out of a new street for carriage traffic on a site at the rear of houses on the north-eastern side of Loampit-vale and the western side of Blenheim-road, Leamington, and in connection therewith the erection of stabling and a shop (Messrs. Harris & Co.).—Consent.

Woolwich.—That an order be issued to Mr. G. Whale refusing to sanction the formation or laying out of new streets for foot traffic only at the rear of houses on the east side of Godfrey-street, Woolwich (for Mr. F. C. Henesy).—Refused.

Space at Rear.

Battersea.—A modification of the provisions of that part of the Act with regard to open spaces about buildings, so far as relates to the proposed erection of buildings at the rear of Nos. 41 and 43, Harroway-road, Battersea, to abut upon Holman-road (Mr. W. Hammond for Mr. F. W. Linfield).—Consent.

Wandsworth.—A house on the west side of Nepean-street, southward of Umbria-street, Wandsworth, so far as relates to the erection of such house, and of a one-story studio and covered way (Mr. A. J. Hardwick for Mr. T. D. McMeekin).—Consent.

Lines of Frontage, Width of Way, and Construction.

Hampstead.—The retention of a wood and iron shed at No. 6, Briardale-gardens, Hampstead, abutting upon Clorane-gardens (Mr. L. Hardy).—Consent.

Limehouse.—The retention of an iron and concrete gangway connecting the third floors of "Eagle Wharf" on the north and south sides of Narrow-street, Limehouse, and to the reconstruction of a gangway connecting the second floors of the premises (Mr. C. Dunch for Mr. T. L. Knight).—Consent.

The recommendation marked + is contrary to the views of the local authority.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The Rev. Professor Cooper, Glasgow University, gave an address to the members of the Edinburgh Architectural Association in the Geographical Society's Lecture Hall, National Portrait Gallery, Queen-street, on the 16th inst., on "A minister's thoughts in regard to the arrangement and furnishing of a Scottish parish church." Adverting to the prospect of a restoration of Kirkwall Cathedral, he said it did not follow that the whole of the large sum of money now happily available for that should be spent at once, and he looked to the Association he had the honour to address to study that venerable minister and then come forward and tell the public, with the emphasis of real knowledge, what was needful to be done and what must on no account be done. Dr. Cooper proceeded to speak of the orientation of churches, the value of the spire, the church porch, the chancel, the side chapel for worship on week days, the vestry, and the halls, which, he thought, in these days were receiving rather disproportionate attention. He praised a committee for the building of a new church in a northern town who had told the architects selected to compete for it that what they chiefly wanted was a fine interior. That showed a great advance upon the time, not long past, when it was outside elegance only that was thought of. He proceeded to denounce side galleries and sloping floors, and said that the worst place possible for the organ was the chancel. He recommended a return to the pulpit canopy; advised that the chancel should not be too deep, yet spacious and unencumbered; and spoke of what was appropriate to the font and the Holy Table. The lecturer concluded by expressing the hope that the Scottish Universities would soon, like their English sisters at Manchester and Liverpool, be supplied with Chairs of Architecture.—Mr. Hippolyte J. Blanc, in proposing a vote of thanks to Dr. Cooper, said he wished to correct a misapprehension which seemed to exist in the mind of the public as to the sum that was at disposal for the Kirkwall Cathedral restoration. The sum was not so large as had been represented. He had made inquiries in England as to how much money had been spent in the restoration of various cathedrals, and he found that the sum that was available for Kirkwall Cathedral was only one-sixth of the amount considered necessary for some of the leading cathedrals there. He was a Conservative, and he hoped he should not allow one penny to be spent on Kirkwall Cathedral unless it was proved to be absolutely necessary. He would have a very sacred regard for every stone in that cathedral before he touched it. A vote of thanks to the Chairman, Mr. H. O. Tarbolton, the President of the Association, terminated the proceedings.—An informal dinner of the Association took place in Ferguson & Forrester's Restaurant, Princes-street, on Saturday evening last week, about sixty members being present. Mr. Harold O. Tarbolton, F.R.I.B.A., occupied the chair, and the croupiers were Mr. W. Glassford Walker, the treasurer, and Mr. Colin B. Cownie, secretary. Among others present were Mr. James Bruce, W.S.; Mr. David Robertson, A.R.S.A.; Mr. A. Hunter Crawford, F.R.I.B.A.; Mr. J. T. Baillie, vice-president of the Association; Mr. Thomas Fairbairn, President of the Society of Ordnance Surveyors; and Councillor D. McArthur. After the loyal toasts had been pledged, Mr. Crabb Watt, K.C., proposed "The Architectural Association of Edinburgh," and in doing so spoke of the services which it rendered to the community in cherishing the taste for antiquarianism in domestic and ecclesiastical architecture. He expressed the hope that its usefulness would be expanded, so that it might assert its authority as an artistic body with regard to contemporary buildings in the city, and in that way perpetuate the traditions, taste, and skill of the architects who in the past had made Edinburgh what it is. He glanced at what had been done during the past thirty years to preserve the charm of the ridge from Holyrood to the Castle, and to promote throughout the city symmetry of outline, ornamentation of elevation, and the breaking-up of sky-lines. The principal blot was probably the horizontal roof of the Caledonian Station, while the design of the North British Railway buildings would perhaps have been better if it had been Gothic, with a tower like the Marischal tower in Aberdeen. If the Association exercised more authority and was able to assert its views

more forcibly they might possibly prevent the demolition of a not unattractive structure in the Synod Hall and the waste of money which could go to the beautifying of a hall on a vacant site. He instanced the National Portrait Gallery in Queen-street as one of the best types of architecture that had been seen in this country for the last twenty years; and for an example of artistic city and street architecture he pointed to *The Scotsman* buildings, which for mass, symmetry, and decorations were, he said, unequalled in the kingdom. The Chairman, in replying to the toast, said the Architectural Association was primarily an educational body, and its objects were threefold—to obtain the practical views and ideas of the most qualified members of the profession, to further the various architectural claims and interests, and for social purposes. The public were to a large extent ignorant of the position and the *raison d'être* of the architect, and the Association looked to its lay members to set them right in that respect and to assist them in upholding the dignity of the profession. He would also ask that there should be more give-and-take among architects, and that the hand of friendship should be more frequently extended by the older to the younger men. They were held together by the bond of common interest, and they should therefore unite in making the Association a powerful centre for the furtherance of those objects which pertained to the welfare of the profession. Mr. Hunter Crawford, on behalf of the members, at this stage presented Mr. William M. Page, who is removing to Glasgow, with several volumes of standard works on architecture, in recognition of his services as secretary of the Association for the past four years. Mr. Page, in replying, said he recognised in architecture not only a great art, but a great moral force. Their city was incomparably beautiful, but its amenity was not altogether respected as it ought to be, and there was too much defacing of buildings by chipping off corners and by pencil and chalk markings. In many ways the city could be made even more beautiful and attractive than it is, and he suggested that the Corporation might with advantage consult an Association like that in connexion with the Usher Hall difficulty. Mr. James Bruce, W.S., in proposing "The Corporation of Edinburgh," said it deserved credit for the careful way in which it considered everything concerning the amenity of the city. He was glad to think that the architectural profession had exercised its influence for good in regard to the High School as a site for the Royal Scottish Academy. Councillor McArthur, whose name was coupled with the toast, having replied, Mr. David Robertson, who proposed "Arts and Crafts," said that Edinburgh had been favoured for a hundred years with a distinguished line of craftsmen, and those of the present day worthily maintained the traditions of the past. Mr. James Ballantine acknowledged the toast. Mr. J. T. Baillie gave "The Guests," for whom Mr. Thomas Fairbairn replied; and Mr. A. Lorne Campbell proposed the health of the Chairman.

NORTHERN ARCHITECTURAL ASSOCIATION.—The fourteenth annual social gathering in connexion with the Northern Architectural Association Students' Sketching Club was held on the 17th inst., in the Church Institute, Hood-street, Newcastle. Mr. J. Walton Taylor, President of the Association, was in the chair. The sketches and measured drawings executed in the various competitions, including the Glover travelling studentship drawings, were viewed with interest. Mr. A. B. Plummer (Secretary of the Association), on behalf of Mr. W. Glover, formerly President of the Association, asked the Association to accept a Presidential chair of oak and green leather, with the arms of the Association carved upon it. Mr. Plummer spoke warmly of Mr. Glover's past generosity to the Association. They had to thank Mr. Glover for the travelling studentship, for the Presidential badge, for the new premises they were about to occupy—for endless gifts, indeed. The President accepted the chair on behalf of the Association, and moved that the following telegram be sent to Mr. Glover:—"Heartily reciprocate your kind greetings, and sorry you cannot be with us." Gift of Presidential chair much appreciated." Mr. H. C. Charlewood seconded the proposal, and hoped they would do their utmost to raise the funds necessary to furnish their new building. The motion was agreed to. Before presenting the prizes to the successful students, the President said the class

of work exhibited was fully up to the standard of previous years. The sketches of the successful competitors showed exceptional merit. In the travelling studentship he hoped there would be keener competition another year. Mr. Taylor then presented the prizes as follows: Glover medal and travelling studentship to Mr. G. S. Twizell. Measured drawings—to Mr. G. E. Gibson; 2nd, Mr. Ralph Stokoe. Sketches—1st, Mr. E. Bird; 2nd, Mr. Bryan Watson. Essays on Mediaeval Architecture—1st, Mr. H. L. Hicks; 2nd, Mr. W. Stockdale.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the meeting on February 15, Dr. W. de Gray Birch, Treasurer, in the chair, a lecture was given by Mr. Andrew Oliver, on "London, Monastic and Ecclesiastical," illustrated by a large number of lantern views, many of which were reproductions of old and scarce engravings of the ancient churches and other buildings of old London, now demolished. Maps and plans were also shown upon the screen. Commencing with a general description of a large map whereon were clearly marked the positions of the various buildings to be described, Mr. Oliver proceeded to remark that fifteen great monasteries, according to the late Sir Walter Besant, stood within and without the City before they were destroyed in the reign of Henry VIII. They belonged to the different religious orders, but the Austin Canons possessed the greatest number of establishments. All that remained now of these once great monastic houses were the chapel of St. Bartholomew's in Smithfield, the church of St. Helen in Bishopsgate, the nave of the church of the Austin Friars, part of the Charterhouse, the gateway and the crypt of the nave of the Priory of St. John, Clerkenwell, the church of St. Mary Overie, Southwark, and the Temple church. Of the parish churches by far the greatest number were situated near the river in the south-east. The dedications of the churches were many times repeated; thus there were eight dedicated to All Hallows, seven to St. Michael, five to St. Martin, four to St. Benet, and so on, while in many cases a second name was added, in order to distinguish one parish from another, as in St. Margaret Pattens (so named from the pattenmakers who lived in the parish), St. Margaret Moses, or Mosses, etc., etc. The largest number of churches were, of course, dedicated to St. Mary, or the Blessed Virgin. The particular dedication is sometimes indicated externally, as in St. Laurence, where the weather vane is in the form of a gridiron, and in the golden key of St. Peter's, Cornhill. St. Alphege's is known as St. Alphege-on-the-Wall, as it is built partly upon the old wall of London, which, indeed, forms the south wall of the church.—A short discussion followed, in which Mr. Lyman, Mr. Emanuel Green, Mr. C. J. Williams, Dr. Birch, and others participated. Mr. Patrick, hon. sec., announced that the Congress this year would be held at Reading in July. Since the meeting the date has been definitely fixed for the 17th of that month.

COMPETITIONS.

NORTHUMBERLAND WAR MEMORIAL, NEWCASTLE-ON-TYNE.—The first premium in this competition has been awarded to Mr. T. Eyre Macklin, sculptor, Newcastle-on-Tyne; the second to Mr. C. S. Errington, architect, Newcastle-on-Tyne; and the third to Mr. F. W. Doyle Jones, sculptor, West Hartlepool. The first-named competitor will be employed to carry out the work, and the premiums of 20*l.* and 10*l.* become payable to the second and third named respectively.

BOOKS RECEIVED.

URBAN POLICE AND SANITARY LEGISLATION, 1904. By F. Noel Keen. (P. S. King & Son. 10*s.* 6*d.*)

MECHANICAL APPLIANCES AND MECHANICAL MOVEMENTS. By Gardner D. Hiscox, M.E. (Archibald Constable & Co. 12*s.* 6*d.*)

PROPOSED RECTORY, YARM, NEAR DARLINGTON.—The foundation-stone was recently laid of a new rectory-house, which is to be erected at Yarm. The architects for the work are Messrs. R. Lofthouse & Son, Middlesbrough, the builders being Messrs. H. Doughty & Sons.

COURT OF COMMON COUNCIL.

The usual fortnightly Court of Common Council was held at the Guildhall, E.C., on Thursday last week, the Lord Mayor presiding.

City Engineer.—The Officers and Clerks Committee reported on the reference of December 1 last to consider the question of the duties and emoluments of the office of engineer. The Committee submitted an amended list of duties, and recommended that the salary of the office should be 1,250*l.* per annum, rising at the discretion of the Court to a maximum of 2,000*l.* per annum, and that candidates must be members of the Institution of Civil Engineers, and not under 35 or over 50 years of age on the day of election. After some discussion the Committee's recommendations were accepted, and the matter was referred back to the Committee with instructions to advertise the position and select five candidates for final selection by the Court.

The Building Act Amendment Bill.—A letter was received from the Kensington Borough Council enclosing copy of the resolution passed at its conference of local authorities on February 6 against this Bill, and asking the Corporation to appoint a representative to serve on a committee, consisting of one representative for each council, to watch the progress of the Bill, and advise as to any further action. Mr. Morton was appointed to represent the Corporation. **The Corporation and Sanitary Inspectors.**—The Committee of the whole Court submitted a report on this question in which they recommended that the salaries should be borne entirely by the Corporation as heretofore, and that no application should be made to the London County Council for payment of half the salaries. The resolution passed by the Court on October 6 last was rescinded, and the Committee's recommendations were carried.

After further business the Court adjourned.

THE LONDON BUILDING ACT AMENDMENT BILL.

Mr. T. F. Blackwell, J.P., the President, presided on Thursday of last week over a general meeting of the members of the London Chamber of Commerce, held at the offices of the Oxford-court, Cannon-street, to consider the London Building Act Amendment Bill, 1904. A lengthy memorandum was submitted, containing objections to many of the clauses in the Bill, which had been adopted by the Joint (trade section) Fire Protection Committee of the Chamber. The Committee particularly objected to the provisions of clause 16, which would place serious obstacles in the way of heightening business premises. They also strongly objected to the sweeping principle in clause 32, relating to compulsory powers of the London County Council to acquire premises for the purpose of a new street. In clause 96, relating to protection against fire in certain new buildings, the main objection of the Committee was the absence of the right of appeal to arbitration.

Mr. Collie Foster, the deputy-chairman of the Committee, proposed the following resolution:—"That this general meeting of members of the London Chamber of Commerce (while admitting the necessity of adequate provision for the safety of life in case of fire) is of opinion that the London Building Act Amendment Bill, 1904, imposes conditions which are in excess of reasonable requirements, and is also of opinion that no case has been made out for the drastic amendments proposed in the general building law of the Metropolis. This meeting approves of the action of the Council of the Chamber in petitioning against the Bill with the object of obtaining a *locus standi* to oppose objectionable provisions, and secure amendments on the lines of the preliminary observations submitted to the London County Council by the Joint Fire Protection Committee of the Chamber." He said that the two principles which the Committee wished to urge were first, that each case should be dealt with according to its merits, and not all in the same manner, and secondly, that unless the same manner, and secondly, that unless the discretion should not be conferred upon the London County Council or any other public officials, but that it should be reserved to cases for the property owner or occupier to propose alternative measures, and that, in the event of failure to agree, there should be recourse to arbitration, or some other competent tribunal of appeal.

Mr. A. W. Poulton seconded the resolution. Mr. E. A. Woodrow, A.R.B.A., said that as representing the architects, he might say that the Bill would render buildings so difficult and so expensive that manufacturers and commercial men would feel that they could

not burden their businesses with enlarging their premises or rebuilding them. If the Bill was not fought tooth and nail they were bound to suffer in the cost of building and the difficulties which would arise.

Mr. Hardy, L.C.C., said he had obtained from the Superintending Architect of the London County Council an expression of opinion as to what he considered the meaning of some of the clauses as to which, he (the speaker) was afraid there was a good deal of misapprehension. Under clause 16 the only desire of the Council was to prevent the raising of old buildings in narrow streets to 60 ft. in height. It was not intended to prevent the re-erection of buildings of the same height as previously existed. Clause 32 was simply to enable the Council to continue the widening or to construct new streets for the purpose of affording communication between any existing streets. Clause 45 was to prevent the erection of warehouse buildings more or less surrounded by dwelling-houses in such a way as to prevent the access of light and air to the dwelling-houses—surely not an unreasonable desire. As to clause 33, relating to the conversion of single shop buildings into two shops, that was not retrospective, and it only required the separation between shops to be of a fire-resisting material.

After further discussion the resolution was carried.

The Lord Mayor is convening a public meeting of the citizens of London at Guildhall on Friday, March 3, at noon, in opposition to the Bill.—A meeting of the inhabitants of Aldgate Ward was held on the 20th inst. to consider the provisions of the Bill. The Lord Mayor, who presided, said that the Bill had provoked a storm of opposition throughout London. The condemnation of the Bill was on its merits, and had nothing to do with political or professional jealousy. Its provisions were retrospective, and damage and ruin would be brought about if it passed the two Houses. Major Bridges Webb, Chairman of the Balic, moved the following resolution:—"That, in the opinion of this meeting, the provisions of the Bill would, if sanctioned, inflict most serious loss and injury upon the trade and commerce of the City, many of these provisions unduly interfering with the existing rights of the Corporation and of the various local authorities throughout the Metropolis, and the citizens should be deterred from consenting to the Bill." The Lord Mayor at the Guildhall on March 3 to protest against the further progress of the measure." In responding the motion Mr. Chatrain suggested that, if alterations in the existing laws were necessary, they should be made in the form of a new Bill drawn in consultation with the H.M.C. and the City of London Council. Surveyor, said that the Bill was confiscatory. Many of the new buildings in the neighbourhood of Lloyd Avenue could not possibly fulfil the requirements of the measure. Mr. Deputy Persse Morrison said the Bill was one of the most iniquitous ever drawn. The resolution was passed unanimously.

We have received from the District Surveyors' Association (Incorporated) their petition against the Bill. The Association admit that certain amendments to the Act of 1894 are required, and they state their full appreciation of the importance of securing better means of escape in case of fire and better protection of buildings against fire. But they contend that the Bill does not effect the desired improvements, that a number of the new proposals are quite unworkable, that if placed upon the Statute-book the measure would tend to make building operations almost impracticable, and that details can only be satisfactorily arranged after careful consideration and conference with the professional societies concerned in building. We shall deal with this petition and the petition of the Royal Institute of British Architects next week.

CONGREGATIONAL CHURCH, SHIREBROOK.—A new Congregational church has been opened at Shirebrook, in Church Drive, in the model village. The church provides accommodation for over 350 persons. Arrangements can also be made for an end gallery, which will seat a further 150 people. Room on the site has been left for the erection of Saturday schools and buildings, which, in the future, will form a complete scheme. The building is faced with Rusley stone rock-faced, with Coxbeach stone dressings. The roof is covered with American sea-green slates. Internally the church has an open dome roof of pitch-pine, and windows filled with stained glass, and is heated by hot-water pipes. The lighting is by electricity, supplied by the Shirebrook Colliery Company. The cost of the church, exclusive of seating, is 1,550*l*. The architect is Mr. C. Nelson Holloway, Nottingham, and the contractors Messrs. Lee & Kirk, Chester.

Correspondence.

SEWER VENTILATION AND INTERCEPTORS.

SIR,—I read Mr. Van Putten's letter and your notes thereto in your issue of the 11th inst. with particular interest, as it touches a question which has acquired peculiar significance in Lincoln during the present lamentable outbreak of typhoid fever. That this outbreak, with the majority of cases resulting therefrom, is due to a polluted water supply there is no doubt; but, to my mind, it is an open question whether several of the secondary cases may not be due to the fact that for several years the local authority has waived that section of its by-laws which refers to the disconnection of house drains from the sewers.

Hence, the majority of modern houses erected in Lincoln are in that condition in which Mr. Van Putten's system would place them, viz., with only the water seal in the basins of the inside water-closets between them and the main sewer, and with the house vent pipes discharging gas from the sewers, possibly to be immediately blown under the slates into the houses.

It has naturally happened here in numerous cases that patients have had typhoid fever for several days before the conditions declared themselves sufficiently for the cases to be notified and isolated, and during that time infected excreta were passing into the sewers; and I put it as a simple question whether, under the conditions I have just named, it is not possible for the sewers to be the vehicle for carrying infection from one house to another.

For instance, only the other day I was called to examine the sitting room of a house, the drains of which were not provided with a sewer interceptor; I found the joint between the outgo of the water-closet and the soil pipe defective inside the house, and therefore discharging gas from the sewers (possibly laden with typhoid germs) directly into the house. Such a defect would have been bad enough had the drains been disconnected from the sewer, but under all the conditions I have named it seemed criminal.

But even where plumbing is perfect the danger still remains, for it is impossible to ignore the well-known fact that a water seal is capable of absorbing gas on the one side and discharging it on the other; and that this process may go on to a slight degree from the house drains there can be no doubt. But where it is gas from the sewers charged with infectious germs that has to be dealt with, it becomes another question.

Mr. Van Putten argues that sewers are cleaner than house drains, and it is just possible that the cleanest sewer he can find may be better than the foulest house drain, but taking average conditions he is most certainly wrong.

The major portion of this town is dead level, and there are miles of sewers practically without fall, some of which can only be kept open by periodically driving scrapers through the manhole to manhole; and I think it will be readily agreed that a fouler gas will be generated in those sewers than in the average house drain.

Like a great many other borough surveyors, Mr. Van Putten looks at the question from his point of view only, viz., from a natural desire to throw the burden of sewer ventilation on to the private householder instead of on to the municipality; and it is interesting to notice that his letter contains not the slightest reference to the effect his proposals would have on the sanitary conditions of the house.

I should better understand Mr. Van Putten's position if, while advocating the abolition of the interceptor, he also advocated soil-pipe disconnection and independent ventilating shafts; for then, the greatest danger disappears, and only the danger from the ventilating shafts remains.

W. G. WATKINS, A.R.I.B.A.

Lincoln, February 22, 1905.

*A further letter on this subject has been held over for want of space.—ED.]

METROPOLITAN ASYLUMS BOARD.—The usual fortnightly meeting of the Managers of the Metropolitan Asylums Board was held on Saturday last week at the offices of the Board, Victoria Embankment. The Works Committee reported that, at the request of the Hospitals Committee, they had sanctioned the carrying out of cleaning and painting works and repairs at the Grove, Park, and Northern Hospitals, at a cost, respectively, of 2,274*l*, 1,400*l*, and 433*l*. Mr. Louis Jacob was appointed to take out the quantities of the work at the Grove and Park Hospitals. On the recommendation of the Children's Committee, it was agreed to carry out certain drainage and tar-paving work at White Oak School at an estimated cost of 665*l*.

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE-STEEL.—VIII.

AN OMNIBUS REPAIR AND ACCUMULATOR DEPÔT.



THE structure which forms the subject of the present article is situated in the Rue de Lagry, near the Porte de Vincennes, Paris, and was erected for the Compagnie Générale des Omnibus to accommodate an installation of accumulators for the storage of electricity in connexion with the tramway services of the company, and to provide local facilities for the repair of vehicles. The building comprises two stories, and adjoins the power house where electricity is generated.

As will be seen by reference to Fig. 51, the ground floor accommodation includes a workshop, measuring 16.09 metres long by 8.65 metres wide, at one end of which is a small brass foundry measuring 6.00 metres by 5.00 metres, and at the other end a coal store measuring 9.14 metres long by 7.40 metres wide. On the first floor there are two accumulator rooms (see Figs. 53 and 54), the dimensions of which are 16.09 metres by 8.65 metres, and 9.14 metres by 7.60 metres respectively.

In order to ensure easy access to the coal store for vans, it was decided to leave an opening 6.72 metres wide in the wall facing the yard (ab Fig. 51). Consequently, the width of the returns was limited to 44 centimetres on either side of the entrance. Similarly, an opening of maximum width was required along the outer side of the workshop to permit easy access for vehicles, and, further, it was necessary that the opening should be without any intermediate support. Here also the returns measured only 44 centimetres wide, as shown at *c* and *d* in Fig. 51.

Owing chiefly to the weight of the storage batteries, the calculated load for the upper floor was determined at 3,500 kilogrammes per square metre (717.5 lb. per sq. ft.).

Hence the problem presented for solution was the construction of two bressummers, one 6.72 metres long over the open side of the coal store, and the other 15.21 metres long over the open side of the repairing shop, each of these members having to carry one side of the upper story and roof, as well as a considerable portion of the floor load.

In view of the unusually high floor load, it is evident that ordinary methods of construction would have required bressummers of colossal proportions, and of such weight as to require exceptionally massive supports. The 15.21-metre opening would probably have necessitated a box or plate girder with a section measuring about 36 in. deep by 18 in. wide, and the 6.72-metre opening a similar girder with a cross section of about 24 in. deep by 14 in. wide.

In order to obviate the employment of heavy steel beams, the building was constructed in reinforced concrete and brick, and designed in such a manner that it is capable of withstanding all the loads coming upon it, without the use of any special members for carrying the loads over the openings in the outer walls. In fact the wall over each opening itself forms the bressummer, as will be realised after consideration of the details given below.

As in the case of the hospital pavilions described in Art. VII., the depôt was built upon soil of very unstable character, being situated on the site of the marshes which formerly existed beyond the exterior boulevards of Paris. The footings consist of two parallel armoured brick walls, 30 centimetres deep by 30 centimetres high by 11 centimetres thick, spaced 8 centimetres apart, as shown at the bottom of Fig. 55, the two walls being joined at the top by a slab of reinforced Portland cement mortar 5 centimetres thick. The caissons so formed support the outer walls of the building, 11 centimetres thick, of brick reinforced with a network of steel rods in accordance with the Cottancin system, the vertical bars of the reinforcement being securely fixed in the top slab of the footing. No piers or buttresses were added for the lateral support of the walls, which carry, at the height of 7.16 metres above the ground level, a floor load of 3,500 kilogrammes per square metre on spans of 8.65 metres and 7.40 metres, in addition to the loads due to the upper story and roof.

To undertake the support of the loads involved upon walls of only 11 centimetres thick, and

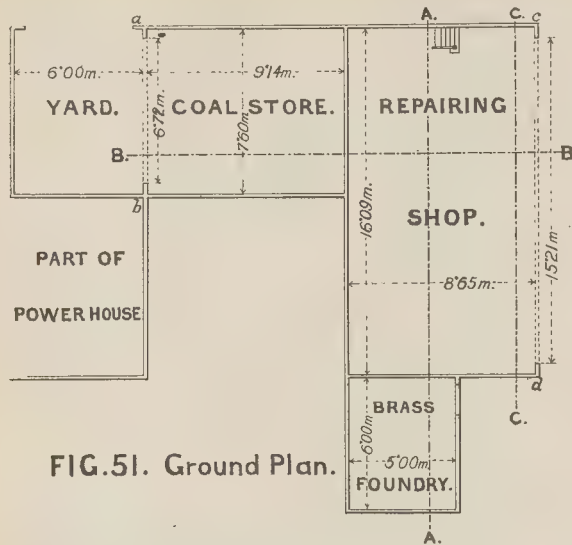


FIG. 51. Ground Plan.

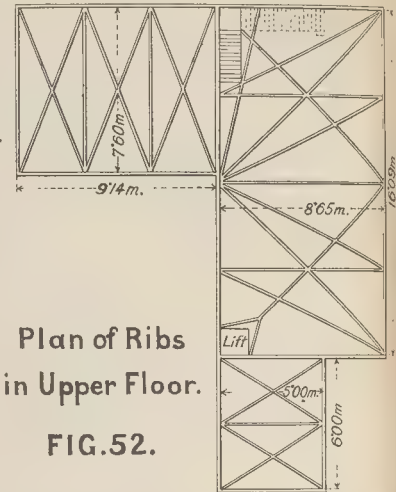
Plan of Ribs
in Upper Floor.

FIG. 52.

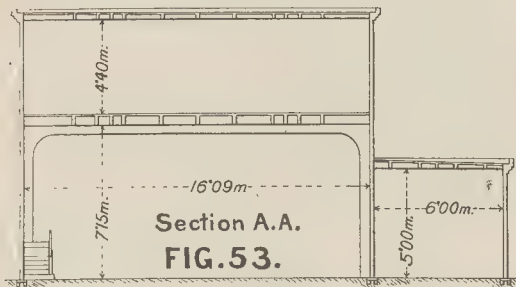
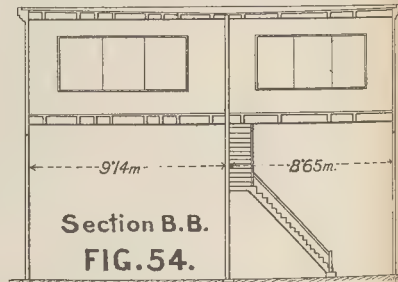
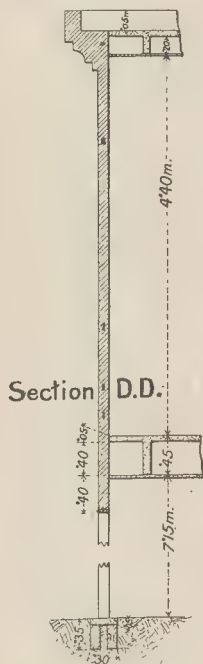
Section A.A.
FIG. 53.Section B.B.
FIG. 54.

FIG. 55.

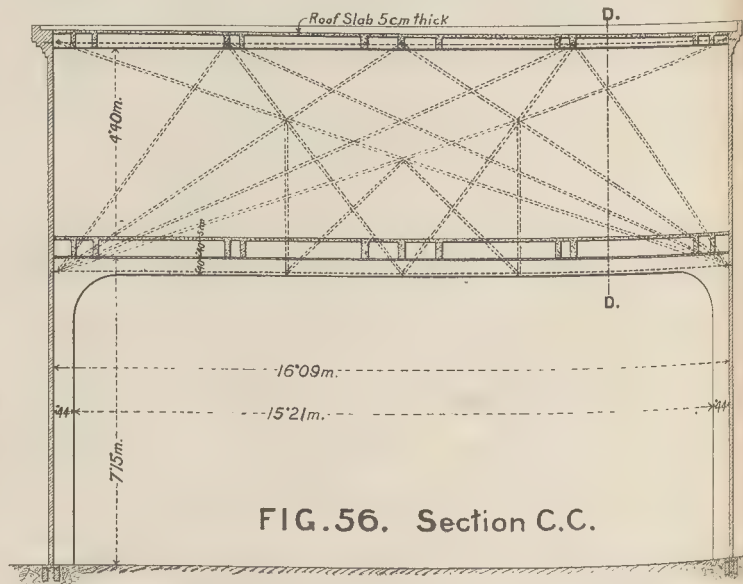


FIG. 56. Section C.C.



FIG. 57.



FIG. 58.

Illustrations to Student's Column.

INCORPORATED CHURCH BUILDING SOCIETY.—This Society held its usual monthly meeting on Thursday, the 16th inst., at 7, Dean's-yard, Westminster, the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz.:—Building new churches at Brondesbury, St. Anne, Middlesex, 225*l.*, in lieu of a former grant of 150*l.*; Broughton Moor, St. Columba, near Cockermouth, Cumberland, 90*l.*, in lieu of a former grant of 80*l.*; Chitts Hill, St. Cuthbert, in the Parish of Tottenham, Middlesex.

100L; and Worcester, St. Martin, 200L. Grants were also made from the Special Mission Buildings Fund towards building mission churches at Charlton-in-Dover, St. Bartholomew, Kent, 30L; and Watford, St. Michael and All Angels, Herts, 40L. The following grants were also paid for works connected with—Swinefleet, St. Margaret, Yorks, 60L; Armley Hall, Holy Trinity, near Leeds, 10L; Northorpe, St. John the Baptist, near Lincoln, 15L; St. Paul's Walden, near Welwyn, Herts, 10L; balance of a grant of 50L; Reading, St. Mark, 170L; Beckton-road, Canning Town, London, E., 50L; Woodland, near Butter Knowle, Co. Durham, 15L; Merryman, near Menheniot, Cornwall, 35L; Brookor's Wood, near North Bradley, Wilts., 10L; and Chilham Lees, near Canterbury, 25L. In addition to this the sum of 125L was paid towards the repairs of thirteen churches from trust funds held by the Society.

PROTEST AGAINST COUNTY ARCHITECT'S APPOINTMENT.—At a meeting of the Heaton Norris Council on the 16th inst. the Levenshulme and Heaton Norris Education Sub-Committee asked for support to be given to a resolution to the effect that the appointment of the County Architect to carry out the erection of new schools in the county area was inadvisable and unsatisfactory. The reasons adduced were, that competition would be prevented, that buildings erected in the past by the county were not samples of economy, that the increase of the architect's salary and provision of a staff would be a permanent charge on the county. The main contention was that local area committees should have a voice in the spending of money, the costs of schools, and the general suitability of the buildings to the requirements of the districts. The resolution was supported by members of the Council. Mr. Barton said the chief duties of the County Architect up to the present had been with regard to police stations, and there been a similarity of design all over the county. New schools might have to be built in the district, and as they had to pay two-thirds of the cost it was only fair they should have a voice in the selection of plans, and not be forced to accept the County Architect's plans whether they approved of them or not.—*Manchester Evening News.*

Legal.

CASES UNDER THE LONDON BUILDING ACT, 1894.

At the North London Police Court, on the 14th inst., before Mr. E. Snow Fordham, Messrs. Munro & Taylor, builders, were summoned by Mr. W. G. Perkins, District Surveyor for West Hackney, for failing to comply with a notice of irregularities requiring them to carry up in brickwork a chimney shaft or smoke flue constructed of drain pipes at No. 44, Buckingham-road, Kingsland.

A flue constructed of drain pipes at these premises had, owing to its dangerous condition, been taken down pursuant to an order made by the magistrate in December last, and the defendants had reconstructed the flue with new pipes, notwithstanding an intimation from the Surveyor that it was not permissible.

Mr. Cowper, solicitor, who appeared for the District Surveyor, pointed out that section 64 (12) required every chimney or smoke flue to be carried up in brick or stone work, 4 in. thick, to a height of 3 ft. above the roof adjoining thereto, but that section 66 (3) adjoining permitted the use of pipes for conveying smoke, and he informed the magistrate that the Surveyor brought the proceedings in order to obtain a ruling of the Court for his future guidance in dealing with similar cases, as builders frequently contended that pipe flues were allowed by the Act.

The Surveyor considered that section 66 (3) merely permitted the raising of a chimney (after passing through a roof for 3 ft.) by means of pipes as frequently necessary when a high building adjoined a lower one, or the carrying of a short length of pipe from a close fire into a brick flue, and that the drain-pipe flue was only the fire-resisting lining of stone-work piping required by subsection 6 of section 64.

After considering the case the magistrate expressed the opinion that the Act clearly required every chimney or flue to be of brickwork, and adjourned the further hearing for fourteen days to enable the defendants to comply with the District Surveyor's notice.

At Lambeth Police Court, on the 14th inst., before Mr. Hopkins. Messrs. C. W. Smallbone & Sons were summoned by Mr. Bernard Dicksee, District Surveyor for Newington, etc., for commencing work at 229, Walworth-road without previously having given the District Surveyor notice, as required by section 145.

The District Surveyor explained that the work consisted of fixing a self-contained cooking range placed upon the wooden floor with only a 1-in. marble slab, scarcely larger than the stove, to protect the floor, whereas the Act required a 6-in. hearth for 15 in. all round the stove, the flue was simply a sheet-iron one carried through the roof of the room without any protection against fire. Considering the great danger of setting fire to the house consequent on such an arrangement the District Surveyor felt it his duty to take proceedings.

Mr. Hopkins fined the defendants the maximum penalty of 40s., with the costs of the summons.

WHITECHAPEL ANCIENT LIGHT DISPUTE.

The case of *Raphael v. Buck & Hickman, Ltd.*, came before Mr. Justice Warrington, in the Chancery Division, on the 16th and 17th insts.—an action by the plaintiff, the owner of premises in Whitechapel, for a mandatory injunction to compel the defendants, the owners of adjoining premises, to demolish so much of their building as obstructed the plaintiff's ancient lights. The premises, the subject of the action, were Nos. 2, Lion-square, and Nos. 6 and 7, Union-street, Whitechapel.

The plaintiff's case was that the defendants had recently erected a building which completely obstructed the light coming to the first floor room, and also the light coming to the second floor room in his premises.

The defendants admitted a certain amount plaintiff's light had been obstructed by their building, but denied that it was material or substantial and sufficient to give the plaintiff a cause of action.

Mr. H. Terrell, K.C., and Mr. Jolly appeared for the plaintiff, and Mr. Norton, K.C., and Mr. Edward Forster appeared for the defendants.

Mr. Terrell, having opened the plaintiff's case, called Mr. Francis Weston, F.S.I., who, examined, said he was a member of the firm of Weston & Sons, surveyors and auctioneers. He had had considerable experience in light and air cases both within the city and outside in the suburbs. He had visited the plaintiff's premises on several occasions. The windows principally affected by the defendants' wall were on the first and second floors of the plaintiff's premises. There was also a small fanlight on the ground floor which was also affected, but it was of no importance. He had not seen the original buildings which stood on the site before the defendants' present buildings were erected. He could, however, pretty well judge of what was there before having regard to the position of the old gable. He considered that the old buildings were expressly constructed so as to avoid obstructing the light of the plaintiff's building. He had examined the light of the rooms in question since the defendants' buildings were erected, and found it very bad. He considered that all the light from the west and north-west was missing. The plaintiff had lost three-quarters of the light on the first floor, and a half of the light on the second floor.

Cross-examined by Mr. Norton, He thought the window on the first floor had lost three-quarters of its light.

What percentage of light do you think the room has lost?—I am not able to say that.

You are not able to give even an approximate idea of that?—No.

Cross-examination continued, This class of property was generally inhabited by aliens. It was a very remunerative property. He did not know how many people lived in the rooms.

Re-examined.

There was more diagonal light on the first floor than on the second.

Mr. S. G. Goss, A.R.I.B.A., examined by Mr. Terrell, said he was the architect instructed by the plaintiff to settle the party-wall notices. On December 16 last he went round to the premises. Defendants had then built their wall 3 ft. higher than the bottom of the railings. He made a report as to what he had seen. He also protested to the defendants' foreman against the work proceeding. He again inspected the premises on December 20, and defendants were still going on with the work. On both these days he went into the rooms in question. He observed the light of the windows on the first and second floors. On January 10 defendants had completed the wall, and got the coping on. When he inspected the rooms on December 16 they were fairly well lighted, but when he went again on January 10 he found the light very considerably diminished, and on January 26 he found it still more diminished. He was a professional valuer. In houses of this kind in the East-end of London, good light was very material. Houses of this class were generally let to small tradesmen, dealers, and

so forth. They used the rooms for working purposes. The letting and selling value of the plaintiff's premises had been materially affected by the loss of light.

Cross-examined, He did not think the rooms on the first floor were now worth 9s. a week, or the rooms on the second floor were worth 8s. a week. The rooms were not fairly lighted there. The first and second floor rooms had more light than the ground floor rooms.

Other evidence having been given, the plaintiff's case closed.

On behalf of the defendants, Mr. Tween, a surveyor, gave evidence to the effect that the obstruction of the light to the plaintiff's windows in consequence of the defendants' building was only slight, and was not material.

At the conclusion of the evidence and the address of Mr. Terrell on behalf of the plaintiff, his lordship, without calling upon Mr. Norton, in giving judgment, said the windows alleged to be affected were in the rear of the plaintiff's house, one looking a little west and the other north, into a yard. Defendants had recently built a high wall several feet above the wall of the plaintiff's house, and the result was that no light now came from the north-west to the two windows in the plaintiff's house. The property was situated in Whitechapel, in the East-end of London, and it had been described as cottage property and alum property. The inhabitants of the neighbourhood largely consisted of persons, mostly Polish and Russian Jews. The two rooms on the first floor were inhabited by a man and his wife and seven children. This man was a tailor, and he employed other people to work for him, and he sold the clothes made on the market. The second floor was inhabited by a man who was a second-hand clothes dealer. He did most of his work at the factory, but he worked occasionally at home. This man lived in these rooms with his wife and five children. All the persons living in the rooms had been called before him, and had told him that the light was not materially worse than it was before. One of them put it a little more strongly still and said that the light was now about the same as it was before. That, of course, must have been an exaggeration, because it could not be quite the same. He saw no reason to disbelieve these people. That was the evidence of people who were actually in the place. The other evidence consisted of experts. He thought the evidence given by the defendants' experts was very much to be preferred to that given by the plaintiff's experts. He thought the plaintiff's expert witnesses came there with their attention directed to the loss of light to the particular windows. He had had, on the part of the defendants, the evidence of Mr. Tween, who gave his evidence, not exactly as an expert, but as that of an intelligent person, who had visited the place for the purpose of seeing what the light was like, Mr. Fish being a director of the defendant Company. The question he had to determine was whether the light was as good as it was before, or whether the comfort and convenience of the people living there, and the character of the neighbourhood according to the ordinary notions of mankind. Having carefully considered the evidence of the plaintiff's experts he had come to the conclusion that there was sufficient light left to the rooms in question for all ordinary purposes having regard to the neighbourhood in which they were situated. This branch of the law had been recently discussed in the House of Lords and elsewhere. Whatever might be the difficulties with reference to these cases, he thought this much was clear, at all events, viz., that it was no longer possible for any Court to act upon the theory that a person, by long enjoyment of a user of a building, could acquire a property in a certain quantity of light coming to that building. But what he did acquire was something in the nature of a negative easement attaching to his own building, and, in order to establish a good cause of action, it must be shown that what the neighbour was doing amounted to an actionable nuisance. For the purpose of laying down the principle which the Courts ought to act, the learned Law Lords had laid down in terms what was a legal nuisance. In the recent case of *Kee v. Jolly*, Lord Justice Vaughan Williams, in the Court of Appeal, purporting to sum up the conclusions of the Law Lords in the *Cellar* case, said:—"The result of all the judgments is that, in order to constitute an actionable nuisance, the obstruction of the plaintiff's light must be such as to sensibly interfere with the plaintiff's premises, and convenience in the use of his premises, having regard to their character according to the ordinary notions of mankind in this country." The passage which he had read seemed to him

BRICKS, &c. (continued).

	s. d.
Thames and Pit Sand.....	7 0 per yard, delivered.
Thames Ballast.....	5 9 " "
Best Portland Cement.....	27 0 per ton, " "
Best Ground Blue Lias Lime	20 0 " "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....	12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. dpt.	

STONE.

	s. d.
BATH STONE—delivered on road wag- gons, Paddington Depot.....	1 6½ per ft. cube.
Do. do. delivered on road waggon, Nine Elms Depot.....	1 8½ " "
PORTLAND STONE (20 ft. average)— Brown Whitbed, delivered on road waggon, Paddington depot, Nine Elms depot, or Fimlico Wharf.....	2 1 " "
White Basebed, delivered on road waggon, Paddington depot, Nine Elms depot, or Fimlico Wharf.....	2 2½ " "

	s. d.
Ancestor in blocks.....	1 11 per ft. cube, delivered, rly. depot.
Beer.....	1 6 " "
Greenhill.....	10 " "
Darley Dale in blocks.....	2 4 " "
Red Corshill.....	2 5 " "
Clooseburned Freestone.....	2 0 " "
Red Mansfield.....	2 4 " "

	s. d.
YORK STONE—Robin Hood Quality, Scrapped random blocks 2 10 " "	
6 in. sawn two sides landings to sizes.....	2 3 per ft. super.
6 in. rubbed two sides ditto, ditto.....	2 6 " "
3 in. sawn two sides slabs (random sizes) 0 11½ " "	
2 in. to 2½ in. sawn one side slabs (random sizes).....	0 7½ " "
1½ in. to 2 in. ditto, ditto 0 6 " "	

	s. d.
HARD YORK— Scrapped random blocks 3 0 per ft. cube.	
6 in. sawn two sides, landings to sizes.....	2 8 per ft. super.
6 in. rubbed two sides ditto.....	3 0 " "
3 in. sawn two sides (slabs random sizes) 1 2 " "	
2 in. self-faced random flags.....	0 5 " "

	s. d.
Hopton Wood (Hard Bed) in blocks 2 3 per ft. cube.	
" " " 6 in. sawn both sides landings 2 7 per ft. super.	
" " " 3 in. do. 1 2½ " "	

SLATES.

	s. d.
20 x 10 best blue Bangor 13 2 6 per 1000 of 1200 at r. d.	
20 x 12 " " 13 17 6 " "	
20 x 10 first quality " 13 0 0 " "	
20 x 12 " " 13 15 0 " "	
16 x 8 " " 7 5 0 " "	
20 x 10 best blue Port- madoc.....	12 12 6 " "
16 x 8 " " 6 12 6 " "	
20 x 10 best Eureka un- fading green.....	15 17 6 " "
20 x 12 " " 18 7 6 " "	
18 x 10 " " 13 5 0 " "	
16 x 8 " " 10 5 0 " "	
20 x 10 permanent green 11 12 6 " "	
18 x 10 " " 9 12 6 " "	
16 x 8 " " 8 12 6 " "	

TILES.

	s. d.
Best plain red roofing tiles ..	42 0 per 1000 at rly. depot.
Hip and Valley tiles ..	3 7 per doz. " "
Best Broseley tiles.....	50 0 per 1000 " "
Do. Ornamental tiles.....	52 6 " "
Hip and Valley tiles ..	4 0 per doz. " "
Best Euxon red, brown, or brindled do. (Edwards).....	57 6 per 1000 " "
Do. Ornamental do.....	60 0 " "
Hip tiles ..	4 0 per doz. " "
Valley tiles ..	3 0 " "
Best Red or Mottled Stafford shire do. (Peakes).....	51 9 per 1000 " "
Do. Ornamental do.....	54 6 " "
Hip tiles ..	5 0 per doz. " "
Valley tiles ..	3 8 " "
Best "Rosemary" brand plain tiles.....	48 0 per 1000 " "
Best Ornamental tiles ..	50 0 " "
Hip tiles ..	4 0 per doz. " "
Valley tiles ..	3 8 " "
Best "Hartshill" brand plain tiles, sand faced.....	50 0 per 1000 " "
Do. pressed.....	47 6 " "
Do. Ornamental do.....	50 0 " "
Hip tiles ..	4 0 per doz. " "
Valley tiles ..	3 6 " "

WOOD.

	At per standard.
Deals: best 3 in. by 11 in. and 4 in. & s. d.	
by 9 in. and 11 in.	13 10 0 15 0 0
Deals: best 3 by 9.....	13 0 0 14 0 0
Battens: best 2½ in. by 7 in. and 3 in. and 3 in. by 7 in. and 3 in.	11 0 0 12 0 0
Battens: best 2½ by 6 and 3 by 5.....	0 10 0 less than 7 in. and 8 in.
Deals: seconds.....	1 0 0 less than best
Battens: seconds.....	0 10 0 " "
2 in. by 4 in. and 2 in. by 6 in.	9 0 0 10 0 0
2 in. by 4 in. and 2 in. by 5 in.	8 10 0 9 10 0
Foreign Sawed Boards.....	0 10 0 more than battens.
1 in. and 1½ in. by 7 in.	1 0 0 " "
2 in.	1 0 0 " "

WOOD (continued).

	At per load of 50 ft.
BUILDING WOOD (continued)	
Fir timber: best middling Danzig or Menzel (average specification)	4 10 0 4 10 0
Seconds.....	4 0 0 4 0 0
Small timber (8 in. to 10 in.) ..	3 12 6 3 12 0
Small timber (6 in. to 8 in.) ..	3 0 0 3 0 0
Swedish balks.....	2 10 0 3 0 0
Pitch-pine timber (20 ft. average)	3 5 0 3 15 0

JOINERS' WOOD.

	At per standard.
White Sea: first yellow deals, 3 in. by 11 in.	24 0 0 25 0 0
3 in. by 9 in.	22 0 0 23 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0 18 0 0
Second yellow deals, 3 in. by 11 in.	18 10 0 20 0 0
3 in. by 9 in.	17 10 0 19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0 14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	13 10 0 15 0 0
Battens, 2½ in. and 3 in. by 7 in.	11 0 0 12 0 0

	At per standard.
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0 22 10 0
Do. 3 in. by 9 in.	18 0 0 19 10 0
Second yellow deals, 3 in. by 11 in. Do. 3 in. by 9 in.	16 0 0 17 0 0
Battens.....	14 10 0 16 0 0
Third yellow deals 3 in. by 11 in. Do. 3 in. by 9 in.	11 0 0 12 10 0
Battens.....	13 0 0 14 0 0
Do. 3 in. by 9 in.	12 10 0 14 0 0
Battens.....	10 0 0 11 0 0

	At per standard.
White Sea and Petersburg: First white deals, 3 in. by 11 in.	14 10 0 15 10 0
Do. 3 in. by 9 in.	13 10 0 14 10 0
Battens.....	16 10 0 17 0 0
Second white deals, 3 in. by 11 in. Do. 3 in. by 9 in.	13 10 0 14 10 0
Battens.....	10 0 0 11 0 0
Pitch-pine: first yellow deals, 3 in. by 11 in. Under 2 in. thick extra.....	0 10 0 1 0 0
Yellow Pine—First, regular sizes 40 oddments.....	28 0 0 upwards.
Seconds, regular sizes.....	25 0 0 " "
Yellow Pine oddments.....	25 0 0 " "
Kauri Pine—Planks, per ft. cube ..	0 3 6 0 5 0

	At per standard.
Danzig and Stettin Oak Logs— Large, per ft. cube.....	0 3 0 0 3 6
Small.....	0 2 6 0 2 9
Wainscot Oak Logs, per ft. cube ..	0 5 0 0 5 6
Dry Wainscot Oak, per ft. sup. as inch.....	0 0 8 0 0 9
3 in. do. do.....	0 0 7 0 0 7

	At per standard.
Fir Mahogany—Honduras, Ta- masco, per ft. super. as inch.....	0 0 9 0 1 0
Selected, Figury, per ft. sup. as inch.....	0 1 6 0 2 6
Dry Walnut, American, per ft. sup. as inch.....	0 10 0 0 1 0
Do. per load.....	17 0 0 21 0 0
American Whitewood Planks, per ft. cube.....	0 4 0 0 5 0

	Per square.
Prepared Flooring, &c.— 1 in. by 7 in. yellow, planed and shot.....	0 13 6 0 17 6
1 in. by 7 in. yellow, planed and matched.....	0 14 0 0 18 0
1½ in. by 7 in. yellow, planed and matched.....	0 16 0 0 1 0 0
1 in. by 7 in. white, planed and shot.....	0 12 0 0 1 4 6
1 in. by 7 in. white, planed and matched.....	0 12 6 0 1 5 0
1½ in. by 7 in. white, planed and matched.....	0 15 0 0 1 6 6
2 in. by 7 in. yellow, matched and beaded or V-jointed bris. 1 in. by 7 in. do. do.	0 11 0 0 13 6
3 in. by 7 in. white, do. do.	0 10 0 0 11 6
1 in. by 7 in. do. do.	0 12 9 0 1 5 0
6 in. at 6d. to 9d. per square less than 7 in.	

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton.
Rolled Steel Joists, ordinary sections.....	5 15 0 5 15 0
Compound Girders, ordinary sections.....	7 5 0 8 7 6
Steel Compound Slatbeams.....	9 2 6 10 12 6
Angles, Tees and Channels, ordi- nary sections.....	7 7 6 8 7 6
Flitch Plates.....	7 15 0 8 5 0
Cast Iron Columns and Stan- chions including ordinary jnt- terms.....	6 12 6 7 15 0

METALS.

	Per ton, in London.
IRON—	
Common Bars.....	7 0 0 7 10 0
Staffordshire Crown Bars, good merchant quality.....	7 10 0 8 0 0
Staffordshire "Marked Bars".....	9 10 0 10 0 0
Mild Steel Bars.....	8 5 0 8 15 0
Hoop Iron, best quality.....	8 15 0 9 0 0
"Galvanized.....	16 10 0 17 0 0
("And upwards, according to size and gauge.)	
Sheet Iron, Black.....	
Ordinary sizes to 20 g.	9 0 0 10 0 0
"24 g.	10 0 0 11 0 0
"26 g.	11 15 0 12 0 0
Sheet Iron, Galvanized, best quality— Ordinary sizes—6 ft. by 2 ft.	
3 ft. to 20 g.	12 10 0 13 0 0
Ordinary sizes to 25 g. and 24 g.	12 10 0 13 0 0
Sheet Iron, Galvanized, flat, best quality— Ordinary sizes to 20 g.	
"22 g. and 24 g.	16 0 0 17 0 0
Galvanized Corrugated Sheets— Ordinary sizes 6 ft. to 8 ft. 20 g.	
"22 g. and 24 g.	12 10 0 13 0 0
"26 g.	13 15 0 14 0 0
Best Soft Steel Sheets, 6 ft. by 2 ft.	
to 3 ft. by 20 g. and thicker.....	11 0 0 12 0 0
Best Soft Steel Sheets, 22 g. & 24 g.	
2 ft. by 20 g.	13 0 0 14 0 0
Cut nails, 3 in. to 6 in.	9 0 0 9 10 0
(Under 3 in., usual trade extras.)	

LEAD, &c.

	Per ton, in London.
LEAD—Sheet, English, 3 lb. and up 15 5 0 " "	
Pipe in coils.....	15 10 0 " "
Soil pipe.....	18 5 0 " "
Compo pipe.....	18 5 0 " "
ZINC—Sheet.....	
Vieille Montagne.....	30 15 0 " "
Silesian.....	30 10 0 " "
COPPER—	
Strong Sheet.....	0 0 10 " "
Thin.....	0 0 11 " "
Copper nails.....	0 0 10 " "
BRASS—	
Strong Sheet.....	0 0 9½ " "
Thin.....	0 0 10 " "
Turn-English Ingots.....	0 1 14 " "
SOLDER—Plumbers'.....	0 0 6 " "
Timmen's.....	0 0 8 " "
Blowpipe.....	0 0 9 " "

ENGLISH SHEET GLASS IN CRATES.

	2½d. per ft. delivered.
15 oz. thirds.....	24d. " "
"fourths.....	24d. " "
21 oz. thirds.....	34d. " "
"fourths.....	34d. " "
26 oz. thirds.....	34d. " "
"fourths.....	34d. " "
32 oz. thirds.....	34d. " "
"fourths.....	34d. " "
Fluted Sheet, 15 oz.....	34d. " "
"21 oz.....	44d. " "
Hardley's Rolled Plate.....	24d. " "
".....	24d. " "
".....	24d. " "

OILS, &c.

	Per gallon
Raw Linseed Oil in pipes.....	0 1 4
" " in barrels.....	0 1 3
" " in drums.....	0 1 2
Boiled " in pipes.....	0 1 7
" " in barrels.....	0 1 7
" " in drums.....	0 1 6
Turpentine, in barrels.....	0 1 6
" " in drums.....	0 1 6
Genuine Ground English White Lead.....	per ton 19 15 0
Red Lead, Dry.....	19 5 0
Best Linseed Oil Putty.....	per cwt. 12 0
Stockholm Tar.....	per barrel 12 0

VARNISHES, &c.

	Per gallon
Fine Pale Oak Varnish.....	0 8 0
Pale Copal Oak.....	0 10 0
Superfine Pale Elastic Oil.....	0 12 6
Fine Extra Hard Church Oil.....	0 10 0
Superfine Hard-drying Oil, for use of Churches.....	0 14 0
Fine Elastic Carriage.....	0 12 6
Superfine Pale Elastic Carriage.....	0 12 6
Fine Pale Maple.....	0 12 6
Finest Pale Durable Copal.....	0 12 6
Extra Pale French Oil.....	0 12 6
Eggshell Flattening Varnish.....	0 10 0
White Copal Enamel.....	0 12 6
Extra Pale Paper.....	0 12 6
Best Japan Gold Size.....	0 12 6
Best Black Japan.....	0 12 6
Oak and Mahogany Stain.....	0 8 6
Brunswick Black.....	0 12 6
Berlin Black.....	0 12 6
Knott's.....	0 12 6
French and Brush Polish.....	0 10 0

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples sent to or left at his office, unless he has specifically asked for them. Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

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All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursdays. (N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the lowest of the Tender is stated, nor any list in which the lowest Tender is under 1000, unless in some exceptional cases and for special reasons.)

* Denotes accepted. † Denotes provisionally accepted.

ABERAVON.—For erecting a villa residence, Nant-rhod, for Mr. O. Adams. Mr. F. R. Smith, architect and surveyor, Port Talbot.
M. Cox 0. 450 0 O Anderson & Vaughan, Aberavon, £1,000 0 0
J. Davey..... 1,205 0 0

BARGOED—For improvements at Church-street and Chapel-terrace, for the Gelligaer and Rhigos Rural District Council:—
J. Sone, Wingfield Cottage, Bargoed. £200 3 1

BRANDON—For erecting a new Wesleyan Methodist chapel at Bradon Colliery, near Durham. Mr. H. T. Gadsen, architect, Durham:—
W. Hall, Bensham, Gateshead. £21,254 10

BRIDGEWATER—For pulling down and removing premises on the eastern side of Honeyuckle-alley, and erecting additions to fire-station, etc., for the Town Council. Mr. F. Parr, Borough Surveyor. Quantities by Surveyor:—
J. Scott £1,950 0
Glad Bros. 1,700 0
J. H. Tapscott .. 1,700 0
J. Stockham .. 1,500 0
J. Farland .. 1,500 0
W. Wilson .. 1,500 0
[All of Bridgewater.]

CARMARTHEN—For erecting a woodcutting shed at the Workhouse, and altering old laundry and wood-cutting room, for the Guardians. Messrs. George Morgan & Son, architects, 24, King-street, Carmarthen:—
S. Davies, 35, St. Catherine-street, Carmarthen £244

CHESTER (Kent).—For road works, part of Borough-road, for the Urban District Council. Mr. J. Fisher, Engineer and Surveyor:—
Atty. & Son £285 0 0
J. Treman .. 270 8 10
Road Maintn. .. 260 0 0
Walls & Sons .. 253 2 6
J. Davis .. 245 5 6
J. Gilly .. 240 0 0
W. Wilson .. 240 0 0
[Surveyor's estimate, £213 10 6.]

CONOLLY—For erecting ten houses. Messrs. J. Hargreaves & Sons, architects, North-street, Kedgeley:—
Messrs. E. Turner, Uley, Mr. Kedgeley
Messrs. J. Laycock, Conolly, Mr. Kedgeley
Slater: T. Throp, Conolly, Mr. Kedgeley
Plumbers: A. Shute, Conolly, Mr. Kedgeley
Plumbers: M. W. & D. D. D. Kedgeley

DAGHAM (Essex).—For 22,000 yds. of pipe sewers, the construction of outfall works, etc., for the Romford Rural District Council. Mr. J. Simmonds, engineer, Bank-chambers, Doncaster:—
B. G. Outage .. £21,945 8 2
J. Moran .. £20,094 0 0
T. Frost .. £2,855 18 0
Sons .. £2,846 0 0
W. W. Wheeler .. £2,198 7 0
T. Adams .. £2,093 8 9
J. Jackson .. £2,346 0 0
E. H. J. .. £2,258 4 8
J. & B. .. £2,700 0 0
Hargreaves & Sons .. £2,696 0 0
O. Bell .. £2,608 0 0
O. Bell .. £2,230 0 0
Wimpsey .. £2,043 0 0
W. H. .. £2,000 0 0

DOVER—For extensions to the premises of the Dover and District Co-operative Society, Ltd., Elgin-street, Mr. A. E. Steele, architect, 1, Elgin-street, Dover. Quantities by the architect:—
Keller .. £2,351
Stones .. 2,344
Parker .. 2,325
Mason .. 2,270
Austen & Lewis .. 2,184
Adams .. 2,252
Bentley .. 2,117
[Architect's estimate, £2,142.]

EAST PRESTON (Sussex).—For alterations to outfall drain and the erection of a mortuary at the workhouse, for the Guardians. Mr. H. Howard, F.S.I., Town Offices, Littlehampton:—
T. Smith .. £202 5 0
C. J. Danks .. 181 5 0
S. W. .. 168 18 6
E. Hill, Littlehampton .. £163 5 0
W. T. Selby .. 144 0 0

EAST STONEHOUSE—For a 12-in. stoneware pipe sewer and a wood-paved road and asphalt footpaths, for the Urban District Council. Mr. F. A. Wilkin, Surveyor, Town Hall, East Stonehouse, Devon:—
J. Dwyer .. £700 8 6
Pearce Bros. .. 700 0 0
Sons .. 613 0 0
E. Danks .. 604 11 0

ERINGTON—For relating drains in the grounds of the Workhouse, for the Guardians of Aston Union. Messrs. C. Whitwell & Son, architects, 23, Temple-row, Birmingham:—
A. E. Skinner, Witton-road, Aston. £101 9 2

GREAT HORTON—For erecting a warehouse at the Central Stores, for the Great Horton Industrial Society, Ltd. Messrs. J. Drake & Son, architects, Queensbury:—
Messrs. and Executors .. £1,800 0
Horton .. 27 10
Horton .. 27 10
Horton .. 103 10
Plumbers: W. Hodgson, Queensbury .. 20 0
Plumbers: W. H. Hillman, Great Horton .. 480 0
Plumbers: H. Barrett & Sons, Bradford .. 480 0
[Highly tender.]

GLASGOW (Survey).—For structural alterations, repairs, and exterior painting to Station-chambers. Mr. C. L. Morgan, architect, 2, Station-chambers, Glasgow, and 43, Canongate, London, E.C. 4:—
W. Robinson .. £138 10
E. Milton, Witley, Surrey .. £133 0

HAMPTON—For making-up Acacia-road and part of Nightingale-road, for the Urban District Council. Mr. H. Chambers, Engineer and Surveyor, Public Offices, Hampton, Middlesex. Quantities by Engineer:—
S. Kavanagh .. £3,152 0 3
F. Hoffmann .. 3,107 18 9
B. Nowell & Co. .. 2,956 15 1
W. Shepherd .. 2,883 5 6
J. Brown .. 2,721 13 6
J. Mowlem & Co., Ltd. .. 2,704 0 0

HARROW—For a new isolation ward block, and enlarging and extending buildings at the Hospital Field, Pioneer-lane, for the Harrow-on-the-Hill Urban District Council. Mr. J. Percy Bennetts, Engineer and Surveyor to the Council:—
E. J. Clayton .. £3,587
Willcock & Co. .. 3,295
Matlock Bros. .. 3,194
Waring White Building Co. .. 3,161
A. Hudson & Son .. 3,157
C. Brightman .. 3,150
J. Carnell .. 3,134
J. Batchelor .. £3,132
J. Ferguson & Co. .. 3,040
J. Lawrence & Son .. 2,994
J. W. Aldridge .. 2,990
J. Shalbourne & Co. .. 2,987
C. Simmonds, Horeley-road, Willesden .. 2,987
Junction, N.W. 2,854

HULL—For painting the branch police-stations in the city, for the Corporation. Mr. J. H. Hirst, City Architect, Town Hall, Hull:—
Gordon-street.

Adams & Usher £38 18 0
Stephen .. 48 0 0
C. Crane .. 48 0 0
[City Engineer's price, £40 13 6]

North-street.
Adams & Usher £38 0 0
Stephen .. 47 0 0
Christopher .. 45 0 0
[City Engineer's price, £40 9 6]

Fire-station.
Simpson & Son £104 0 0
Lightowler & Son .. 97 0 0
[City Engineer's price, £75 17 6]

Wine-street.
Adams & Usher £39 5 0
Hul .. £20 10 0
Co. .. 36 0 0
[City Engineer's price, £25 8 6]

Croft-street.
Codner & Son .. £49 10 6
Lightowler & Son .. 48 0 0
[City Engineer's price, £35 0 0]
[All of Hull.]

IRBOTSCHOLME—For additions to stable buildings at Irbottschole, Kendal, for Mr. J. Wrigley, J.P. Mr. J. Bingley, architect, 7, Lowthorpe-street, Kendal:—
Masonry, etc.
Pattinson .. £700 0 0
Hinchell & Co. .. 608 13 0
Atkinson .. 578 0 0

Carpentry and Joinery.
Alroy & Belton £230 15 0
Bibby & .. 228 10 0
Martendale .. 225 0 0

Plumbing, Painting, Glazing, etc.
Huddleston .. £210 18 4
J. A. Pattinson .. 210 0 0
Bousfield .. 294 8 0
Parsons .. 197 1 8

Plastering, Concreting, etc.
Cousins .. £138 0 0
Davis .. 118 0 0
Kethley .. 103 13 0
Sleet & Co. .. 105 10 8

LONDON EDUCATION COMMITTEE TENDERS.
Lewisham, Gordenbrook-road, New School (Heating Apparatus).

G. Davis .. £876 0
J. Fraser & Son .. 870 0
H. C. Price, Lea, & Co. .. 880 0
Strode & Co. .. 733 0
O. & B. Bradley .. 703 0
Comyn, Ching, & Co., Ltd. .. 680 0

Hampstead, Roslyn-hill (Drainage Work).
Tugwell & Son .. £125 0
W. J. King .. 115 0

Sanitary and Drainage Work at various Schools.

	(Bethnal-green, S.W.)	(Stepney) Wilnot-street.	(Islington) York-road.	(Barnet) Philpot-street.	(Barnet) Page's-walk.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
J. Willmott & Son	1,500 0 0	80 0 0	125 0 0	85 0 0	1,790 0 0	
A. Porter	1,251 0 0	27 7 0	66 0 0	51 15 0	1,396 2 0	
McCormick & Son	1,289 0 0	39 0 0	80 0 0	49 0 0	1,377 0 0	
Lathley Bros.	1,198 0 0	37 0 0	74 0 0	63 0 0	1,372 0 0	
E. Symes	1,178 0 0	32 0 0	57 0 0	49 0 0	1,314 0 0	
E. Lawrence & Sons	1,040 0 0	51 0 0	101 0 0	70 0 0	1,262 0 0	
L. H. & R. Roberts	1,099 0 0	32 0 0	60 0 0	55 0 0	1,243 0 0	
F. & E. J. Wood	1,065 0 0	34 0 0	70 0 0	42 0 0	1,201 0 0	
Stevens Bros.	1,046 18 0	33 10 0	74 0 0	45 10 0	1,199 18 0	
Durbin & Katesmark	985 0 0	35 10 0	65 12 0	75 10 0	1,101 12 0	
L. Whitehead & Co., Ltd.	1,023 0 0	24 0 0	56 0 0	39 0 0	1,147 0 0	
F. Peattie	996 0 0	23 10 0	54 6 0	41 0 0	1,114 15 6	
F. Bull, 31, Old Hill-street, Upper Clapton	953 0 0	24 10 0	57 15 0	34 0 0	1,069 5 0	

HARRINGTON (Cumberland).—For erecting two houses in Church-terrace. Messrs. W. G. Scott & Co., architects and surveyors, Victoria-buildings, Workington:—
Builder: J. Shackley, Harrington £595 0
Joiner: H. Graham, Harrington 283 10
Slater: E. Burrow, Workington 41 10
Plasterer: F. M. Hageney, Workington 89 0
Plumber: W. Stewart, Workington 90 15
Painter: G. Davies, Workington 89 0

KERESLEY (Coventry).—For the erection of a motor house for Mr. W. Hillman. Messrs. Barrett & Driver, architects, 22, York-place, Baker-street, W.:—
A. Becham, jun. £128 10
C. Gardick .. 120 0
Little Heath, Folehill, Coventry .. £103 16

KIRTON (Lincs).—For erecting a science laboratory at the Sir Thomas Middlecot's Endowed School, for the Governors. Mr. J. Rowell, architect, Church-lane, Boston:—
J. Langley & Sons, Kirton, dr. Boston: £660
[Exclusive of heating, and accepted subject to approval of Board of Education.]

LEDGERY—For Storesbrook Bridge, for the Hereford County Council. Mr. A. Dryland, County Surveyor, Shirehall, Hereford. Quantities by Engineer:—
J. Watkins & Son .. £888 0
Beavan & Hodges .. 683 0
G. Hill .. 684 0
D. Smith .. 685 0

LIPHOOK (Hants).—For erecting a block of four cottages at Wheatheaf-common, for Mr. J. C. Hawkshaw. Mr. W. A. T. Carter, architect, 15, Waldegrave-road, Wimbledon, S.W.:—
F. Adams .. £1,891 5 0
F. Chinchin & Co. 1,800 0 0
J. Holder .. 1,775 15 7
J. Lee .. 1,760 0 0
Sycamore Works, Ltd. 1,688 11 1
W. Mould .. £1,888 7 0
W. N. Brading .. 1,683 19 0
Crosby & Co. 1,583 0 0
G. Chasewas .. 1,587 13 4
W. Randall & Sons .. 1,500 0 0
A. Cesar & Sons .. 1,455 0 0

LLANSAMLET (Wales).—For erecting a workmen's institute, for the Rev. J. Martin Griffiths, Vicar of Llan-samlet. Mr. Henry Thomas, architect, Church-street, Llan-samlet. Quantities by architect:—
I. & F. Weaver £900 0 0
Thomas & Jones 880 0 0
Jones & Thomas 878 14 8
O. L. Davies .. £820 0
Jones & Owen 742 17 3
D. W. Rouse .. 725 0 0
Llan-samlet* 725 0 0

LONDON—For the completion of the restoration of No. 17, Fleet-street, for the London County Council:—
J. Allen & F. & F. H. Sons .. £2,950 0 0
T. G. Sharp .. 2,888 0 0
H. W. Reason .. 2,980 0 0
Higgs & Hill, Ltd. .. 2,654 0 0
H. L. Hollis .. 2,627 0 0
T. L. Green .. 2,606 0 0
W. Johnson & Co., Ltd. 2,659 0 0

LONDON—For the manufacture, supply, delivery, and erection of five penstock and two timber dams, with all accessories, at the penstock chambers in Turner's-road and Rhodeswell-road, Stepney (in connexion with the first section of the northern low level sewer No. 2), for the London County Council:—
Hunter & English .. £2,335
R. Moreland & Son, nedy, Ltd. .. £2,094
Ltd. .. 2,296
Yates & Thom .. 2,294
Ashton, Frost, & Co., Ltd. .. 2,150
J. Blakeborough & Sons, Brighouse, Yorks* 2,030

MANSFIELD WOODHOUSE—For sewerage and sewage disposal works, for the Urban District Council. Messrs. G. & F. W. Hodson, engineers, Loughborough:—
S. W. Harrison & Co. £12,000 0 0
G. Lawson .. 11,517 0 0
A. Eastwood .. 10,648 0 0
G. Bell .. 10,169 4 0
J. F. Price .. 9,854 17 6
W. Moss & Son, Ltd. .. 9,700 0 0
H. Ashley .. 9,450 0 0
Lock, And-draw, Price .. 9,400 0 0
A. J. Cottle .. 9,160 15 0
J. Byron .. 9,132 10 0
Lane Bros. .. 9,110 6 0

B. Firth & Co. £8,900 0 0
Twelbridge & Moore .. 8,765 0 6
W. Briggs .. 8,650 0 0
Parker & Sharp .. 8,529 8 6
J. & J. Warner .. 8,437 0 0
Bower Bros. .. 8,429 0 0
Ward & Tet-ley, 147, S w a n .. 8,400 0 0
Baker .. 8,400 0 0
Baker .. 8,400 0 0
Bradford* .. 8,368 14 9

TENDERS—Continued on page 222.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered
*Designs for Clock Tower, St. George's-circus, S.E.	The Committee	20l., 15l., and 10l.	Mar. 31
*Designs for Poulson Memorial	The Executive Committee	Not stated	No date.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Stone	Goring R.D.C.	E. Mullard, Surveyor, Goring Station, G.W.R.	Feb. 25
Materials and Team Labour	Radcliffe U.D.C.	W. J. Rothwell, Engineer, Council Offices, Radcliffe	do.
Stores (Electricity Department)	Ilford U.D.C.	A. N. Shaw, Electricity Department, Ley-street, Ilford	Feb. 27
New Small Tower Brewery, Sowerby Bridge	Aberbeeg (No. 8) Building Club	T. Lister Patchett, Architect and Surveyor, George-sq., Halifax	do.
Twenty Houses at Aberbeeg, Mon.	Warrington Paving, etc., Committee	Borough Surveyor, Town Hall, Warrington	do.
Materials and Stores	do.	do.	do.
Carting	Pontypridd U.D.C.	P. R. A. Willoughby, Surveyor, Pontypridd	do.
Twenty-five Cottages at Ryffelen, near Pontypridd	Handsworth U.D.C.	H. Richardson, Surv., Council House, Handsworth, Birmingham	do.
Making Endwood Court-road	Stockport Corporation	J. Atkinson, Borough Surveyor, Stockport	do.
Special Work, Tramways	Heaton Norris U.D.C.	E. W. Brooks, Clerk, Council Offices, Heaton Moor	do.
Materials and Stores	Newcastle-on-Tyne Corporation	Young & Mackenzie, Scottish Provident Buildings, Belfast	do.
Painting, etc., First Presbyterian Church, Bangor	King's Lynn Corporation	City Property Surveyor's Depart., Town Hall, Newcastle-on-Tyne	do.
Painting, etc., Plunge Bath at Northumberland Baths	Slough U.D.C.	O. Claude Robinson, Engineer, Public Offices, Dyne-rd., Kilburn	Feb. 28
Maintenance of Telephones and Wires	East and West Molesey Dis. Council	J. Pilling, Engineer, Electricity Works, King's Lynn	do.
200-kw. Steam Dynamo, etc.	Carlisle Gas Committee	Town Surveyor's Office, 1, Mackenzie-street, Slough	do.
Laying Cement Concrete Footpaths	Manchester Markets Committee	D. Cann, Clerk to District Council, Molesey	do.
Maintenance of Langdon-road, East Molesey	West Riding C.C.	W. J. Smith, Engineer, Gasworks, Carlisle	do.
Cartage Works	do.	City Architect, Town Hall, Manchester	do.
Supplies	J. Vickers-Edwards, Architect, County Hall, Wakefield	do.	do.
Extension of Lairs, etc., Trafford Wharf	do.	do.	do.
Cov. Sheds at Dringhouses Without Provided Schools	do.	do.	do.
Closet and Lavatory, etc., Old Town Hall, Elland	do.	do.	do.
Altering Premises, Fitz-street, Healden Bridge	do.	do.	do.
Pulling Down Temporary School, Dringhouses	do.	do.	do.
Re-erecting School at Kinsley, Handsworth	do.	do.	do.
Classrooms, etc., Crigstone British Provided Schls.	Foots Cray U.D.C.	W. A. Farnham, Surveyor, Council Offices, High-street, Sidcup	do.
Annual Contracts	G.W. Railway Co.	G. K. Mills, Secretary, Paddington Station, London	do.
Sleepers	West Ham Borough Council	Borough Engineer, Town Hall, West Ham, E.	do.
*Making-up Streets	do.	do.	do.
*Extension of Bath, Plaster	Willenden District Council	Council's Engineer, Dyne-road, Kilburn, N.W.	do.
*Alterations to Prisoners' Cells, Stratford	Shardlow R.D.C.	J. S. Woodfield, District Surveyor, Aston-on-Trent, Derby	Mar. 1
Annual Contracts	New Sarum Town Council	H. H. Scott, Borough Surveyor, Town Hall, Hove	do.
Road Materials and Tools	Doncaster R.D.C.	W. B. Crabtree, Surveyor, Union Offices, High-street, Doncaster	do.
Hartington Road Improvements	Handsworth Education Committee	Wood & Kendrick, Architects, High-street, West Bromwich	do.
Granite	Merton Parochial Committee	E. J. Gowan, Clerk, District Council Offices, Town Hall, Croydon	do.
Alterations, etc., at Rookery-road Council Schools	Hull Electric Lighting Committee	City Treasurer, Town Hall, Hull	do.
Scavenging	New Hunstanton U.D.C.	J. S. B. Glasier, Clerk, Council Offices, New Hunstanton	do.
Watering Roads	Hove Corporation	H. H. Scott, Borough Surveyor, Town Hall, Hove	do.
Mains and Cables	Great Yarmouth Corporation	W. J. Coulson, Surveyor, Council Offices, Cramlington	do.
Making-up Part of Cliff-parade	Cramlington U.D.C.	W. J. Leskey, Town Hall, Eccles	do.
Underground Lavatory, Goldstone-villas	Eccles Corporation	County Surveyor's Office, Town Hall, Bridgend	do.
Hartington Road Improvements	Glanorgan C.C.	W. J. Cleaver, Clerk, Brougham-ter., West Derby-rd., Liverpool	do.
Electric Lighting (Two Water-tube Boilers, etc.)	West Derby Guardians	K. F. Campbell, Borough Engineer, 1, Peel-street, Huddersfield	do.
Scavenging	Huddersfield Corporation	Borough Surveyor, Town Hall, Walworth-road, S.E.	do.
Watering Roads	West Riding Education Committee	J. Vickers-Edwards, County Hall, Wakefield	do.
Mains and Cables	Hove Corporation	Borough Surveyor, Town Hall, Hove	do.
Making-up Part of Cliff-parade	Borough Engineer, Town Hall, Walworth-road, S.E.	Borough Engineer, Town Hall, Walworth-road, S.E.	do.
Underground Lavatory, Goldstone-villas	Baher and The Dillons U.D.C.	A. J. Henderson, Surveyor, Council Offices, Thames Ditton	Mar. 2
Hartington Road Improvements	Manchester Corporation	W. Hirst, Borough Surveyor, 1, New street, Osnott	do.
Electric Lighting, etc., of Museum-bldgs., Walworth-rd.	do.	C. Nickson, Gas Department, Town Hall, Manchester	do.
Asphalting Playgrounds and Paving, Southwam-wl. Fields Schools	Friern Barnet U.D.C.	Mr. Reynolds, Sur., Council-chbrs., Beaconsfield-rd., Friern Barnet	do.
Sanitation, etc., Works, Southwam-wl. Fields Schools	Newcastle-on-Tyne Corporation	City Property Surveyor's Depart., Town Hall, Newcastle-on-Tyne	Mar. 3
*Underground Lavatory	Hertford R.D.C.	J. W. Riggs, Surveyor, 3, Port Vale-terrace, Hertford	do.
Erection of Stables, Greenmore Wharf	Hull Bridges Committee	A. E. White, City Engineer, Town Hall, Hull	do.
Stores	Hull Tramways Committee	do.	do.
Laying 1,000 lb. yds. of 18-in. Earthen Pipe Sewer	East Argentine Railway Co., Ltd.	R. G. Fennessy, 50, Old Broad-street, London, E.C.	do.
Cast-Iron Watertank, Gaythorn Station	Newburn U.D.C.	J. Witter, Architect, Elgin	do.
200 tons of 8-in. Cast-Iron Pipes	Newcastle-on-Tyne Corporation	T. Gregory, Council Offices, Newburn-on-Tyne	do.
Road Making, Wilton-road	Borough Electrical Engineer, Frederick-road, Pendleton	Borough Electrical Engineer, Frederick-road, Pendleton	Mar. 4
Cleaning Walls, etc., of Police Stations	Hertford R.D.C.	J. W. Riggs, Surveyor, 3, Port Vale-terrace, Hertford	do.
Repair of Roads	Do.	H. W. Taylor, Engineer, St. Nicholas-chambers, Newcastle-on-T.	do.
Toggle Gear, etc., Machinery for Lifting End of Bridge	Do.	do.	do.
Steel & Iron Work for Strengthening Drypool Bridge	Do.	do.	do.
Bolts, Nuts, and Rivets	Do.	do.	do.
New San. Arrange, etc., Anderson's Institution, Elgin	Do.	do.	do.
Road Materials and Leading Materials, etc.	Do.	do.	do.
Alterations to Storage Batteries	Do.	do.	do.
Gravel and Deeper Route, Sewer Diversion at Gilegate	Do.	do.	do.
Lower or Shallower Route Sewer Diver. at Gilegate	Do.	do.	do.
Roads on Ground at Nott's Recreation Office	Do.	do.	do.
Supplying, Quarrying, Laying, etc., Materials	Do.	do.	do.
Broken Whinstone	Do.	do.	do.
Materials	Do.	do.	do.
Stores and Works	Do.	do.	do.
6,000 tons of Stone	Do.	do.	do.
Team Labour	Do.	do.	do.
Enamel Iron Plates	Do.	do.	do.
Asphalting at Newton Recreation Ground	Do.	do.	do.
Road Material and Carting	Do.	do.	do.
Night Soil Removal	Do.	do.	do.
Disinfectants	Do.	do.	do.
Stores	Do.	do.	do.
Goods Office in Masonry, Londonderry	Do.	do.	do.
Granite	Do.	do.	do.
Schools for 200, Walton-on-the-Hill	Do.	do.	do.
Two Shops, Dunraven-street, Tonypandy	Do.	do.	do.

CONTRACTS.—Continued.

[illegible]

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
Police Foremen (Three)	Bermondsey Borough Council	22. 10s. per week each	Mar. 6
Police Sergeant	M.B. of Deptford	Not stated	Mar. 8
Assistant Sergeants	Admiralty	150 <i>l.</i> per annum	No date.

Those marked with an (*) are advertised in this number.

Competitions, iv.

Contracts, iv. vi. viii. x.

Public Appointments xix.

TENDERS.—Continued from page 219.

LONDON.—For the construction of new cells at Tottenham Court-road Police Station. Mr. J. Dixon Butler, Surveyor to the Metropolitan Police, Architect, New Scotland-yard. Quantities by Messrs. Thurgood, Son, & Chidgey, Charing Cross-chambers, Duke-street, A.1elphi:—
 A. Hood.....£3,380 F. & H.F. Higgs.....£3,059
 Jascolles & Co.....£120 Lethby Bros.....2,863
 Grover & Son.....3,099 Lawrence & Son.....2,871
 Higgs & Hill.....3,074 Lovatt, Ltd.....2,825
 Holloway Bros.....3,073

MERTHYR.—For alterations to the elevation of the "Red Cow Inn," Glabeland-street, Merthyr Tydfil, to be done in oak wood, for Messrs. Giles & Harrop:—
 E. Sullivan.....£364 O J. Jenkins.....£316 O
 T. Jones.....348 O W. C. Jones.....310 O
 J. Williams.....348 O M. Warlow.....308 12
 S. Hawkins.....348 O Merthyr.....308 12

RUSHDEN (Northants).—For erecting free library buildings, for the Free Library Committee. Mr. W. E. Madin, architect, Vestry Hall, Rushden. Quantities by the architect:—

	Ketton Stone.	Stamford Stone.	Corsham Down Bath Stone.
Cracknell.....	£ 2,718	s. d. 6 2,698	£ 0 0 2,668
Co-operative Builders.....	2,610	0 2,510	0 0 2,500
G. Henson.....	2,493	0 2,375	0 0 2,363
Hackley Bros.....	2,469	0 2,362	0 0 2,350
R. Marriott.....	2,440	0 2,417	0 0 2,365
T. Willmott.....	2,425	0 2,387	0 0 2,369
Harrison & Winer.....	2,391	0 2,356	0 0 2,340
H. Sparrow.....	2,372	2 8 2,333	11 8 2,318
Whittington & Tomlin.....	2,357	0 2,272	0 0 2,272
Brown & Sons.....	2,354	12 6 2,245	12 6 2,238
C. E. Bayes.....	2,345	0 2,270	0 0 2,260
Berrill & Green.....	2,300	0 2,260	0 0 2,245
Higgs.....	2,299	10 0 2,260	19 0 2,245
W. Packwood, Rushden.....	2,238	19 0 2,238	9 0 2,222

[Architect's estimate, £2,860.]

SHORTLANDS.—For the surface drainage of Kingswood and Mays Hill Roads, for the Beckenham Urban District Council. Mr. J. A. Angell, Surveyor, Beckenham:—
 R. Dean & Co.....£1,845 W. Pearce.....£1,097
 H. Woodhams & Son.....1,229 W. F. Wheeler.....1,094
 Fry Bros.....1,221 H. Goodwin.....1,076
 T. Adams.....1,140 Mowlem & Co.....1,013
 P. Hes.....1,139 Free & Sons, Maidenhead.....972
 P. Hofmann.....1,114 head.....972
 † Recommended for acceptance.

SOUTHEND-ON-SEA.—For erecting a building for manual instruction, etc., adjoining the London-road schools, Queen's-road, for the Corporation. Mr. E. J. Rifford, Borough Engineer, Southend. Quantities by Borough Engineer:—

W. E. Davey, Victoria-avenue, Southend-on-Sea.....£1,187
 [Eight tenders were sent in.]

TENDRING.—For 250 yds. of 9-in. outfall sewer, and for sewage purification works, for the Union Workhouse, for the Guardians. Mr. A. J. Martin, engineer, 7, Victoria-street, Westminster, S.W.:—
 J. Jackson.....£1,257 14 8 E. Saunders.....£813 0 0
 F. J. Coxhead.....959 0 0 G. Burgoynes.....791 11 5
 F. G. Thurman.....854 6 8 Robins.....748 0 0
 J. Moran & Son.....845 19 6 Wilson, Borden & Co., Romford.....713 15 0
 T. W. Marsh.....833 10 8
 J. G. Porter.....820 0 0

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TWICKENHAM.—For the erection of pumping station, boiler-house, refuse destructor, chimney shaft, etc., for the Twickenham Urban District Council. Mr. F. W. Pearce, Surveyor, Town Hall, Twickenham:—

		Deduction if Patent Victoria Stone is used.
Ferguson & Co.....	£15,350	0 0 ..£950 0 0
T. L. Pearson.....	14,987	0 0 ..184 0 0
Mowlem & Co., Ltd.....	14,230	0 0 ..31 0 0 (add).
J. W. Brooking.....	14,900	0 0 ..400 0 0
Johnson & Son.....	13,374 18 5	..155 17 11
Speechley & Smith.....	12,950	0 0 ..379 0 0
Pethick Bros.....	12,813	0 0 ..400 0 0
Hudson & Co.....	12,758	0 0 ..302 5 0
L. F. Lamplough.....	12,600	0 0 ..287 0 0
Chambers Bros.....	12,494	0 0 ..566 0 0
Chesam & Sons.....	12,440	0 0 ..340 0 0
Soole & Son.....	12,440	0 0 ..415 0 0
Perry & Co.....	12,320	0 0 ..350 0 0
E. Potterton.....	12,240	0 0 ..153 0 0
Thomas & Edge.....	12,149	0 0 ..330 0 0
Kingerlee & Sons.....	11,995	0 0 ..480 0 0
Lawrence & Son.....	11,959	0 0 ..275 0 0
Wilkinson Bros.....	11,826	0 0 ..349 0 0
Kirk & Randall.....	11,977	0 0 ..300 0 0
Willcock & Co.....	11,955	0 0 ..350 0 0
W. Watson.....	11,950	0 0 ..275 0 0
Foster Bros.....	11,828	0 0 ..584 0 0
W. Wallis.....	11,704	0 0 ..515 0 0
F. G. Minter.....	11,585	0 0 ..265 0 0
W. J. Renshaw.....	11,397	0 0 ..300 0 0
F. & E. Davey, Ltd.....	11,287	0 0 ..700 0 0
Ridgeway & Shaw.....	11,347	0 0 ..245 0 0
R. E. Nightingale.....	11,300	0 0 ..250 0 0
Cowley & Drake.....	11,295	0 0 ..705 7 10
Johnson & Co.....	11,200	0 0 ..250 0 0
G. Wimpey & Co.....	11,139	0 0 ..350 0 0
E. Wall.....	10,982	0 0 ..188 0 0
S. Page & Son.....	10,649	0 0 ..387 0 0
G. H. Gibson.....	10,590	0 0 ..298 0 0
Wisdom Bros.....	10,475	0 0 ..250 0 0
Haycock & Son.....	9,930	0 0 ..227 0 0

URMSTON.—For paving, draining, and improvement works in Firwood avenue, Oak-grove, Stephenson-street, etc., for the Urban District Council. Mr. J. Heath, Surveyor, Council Offices, Urmston:—

W. A. Stamp & Sons.....	£5,801	8 10	W. Woodline.....	£5,017	3 9
M. Naylor.....	5,485	5 4	W. H. Worthington.....	4,989	13 3
G. Boyson.....	5,246	16 9	Johnson & Hindley.....	4,921	16 10
T. F. Willan.....	5,064	14 4	W. Snape & Sons.....	4,847	0 0
G. Clark & Sons.....	5,047	0 10	Sons.....	4,578	19 5
C. Braddock & Co.....	5,025	0 8			

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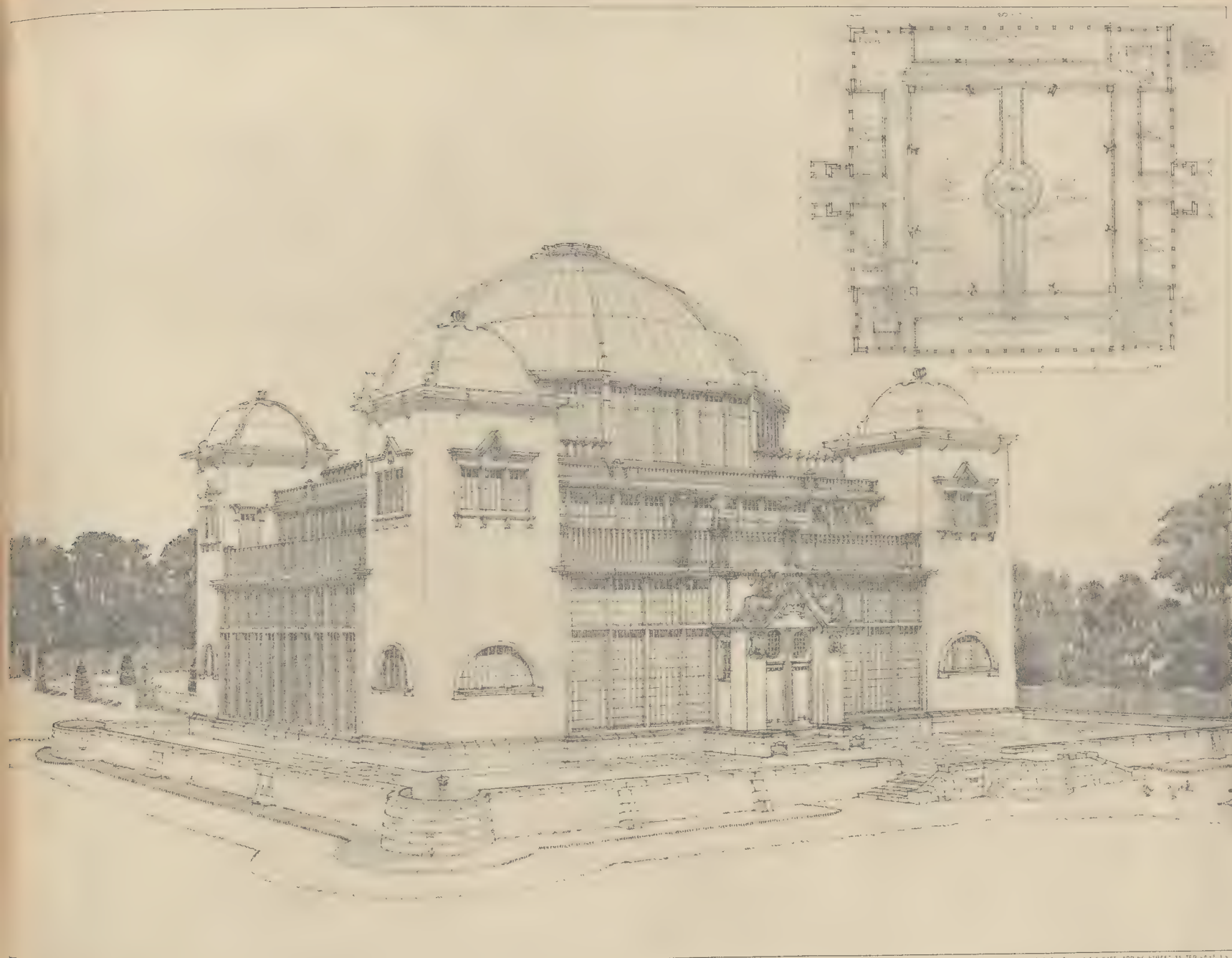
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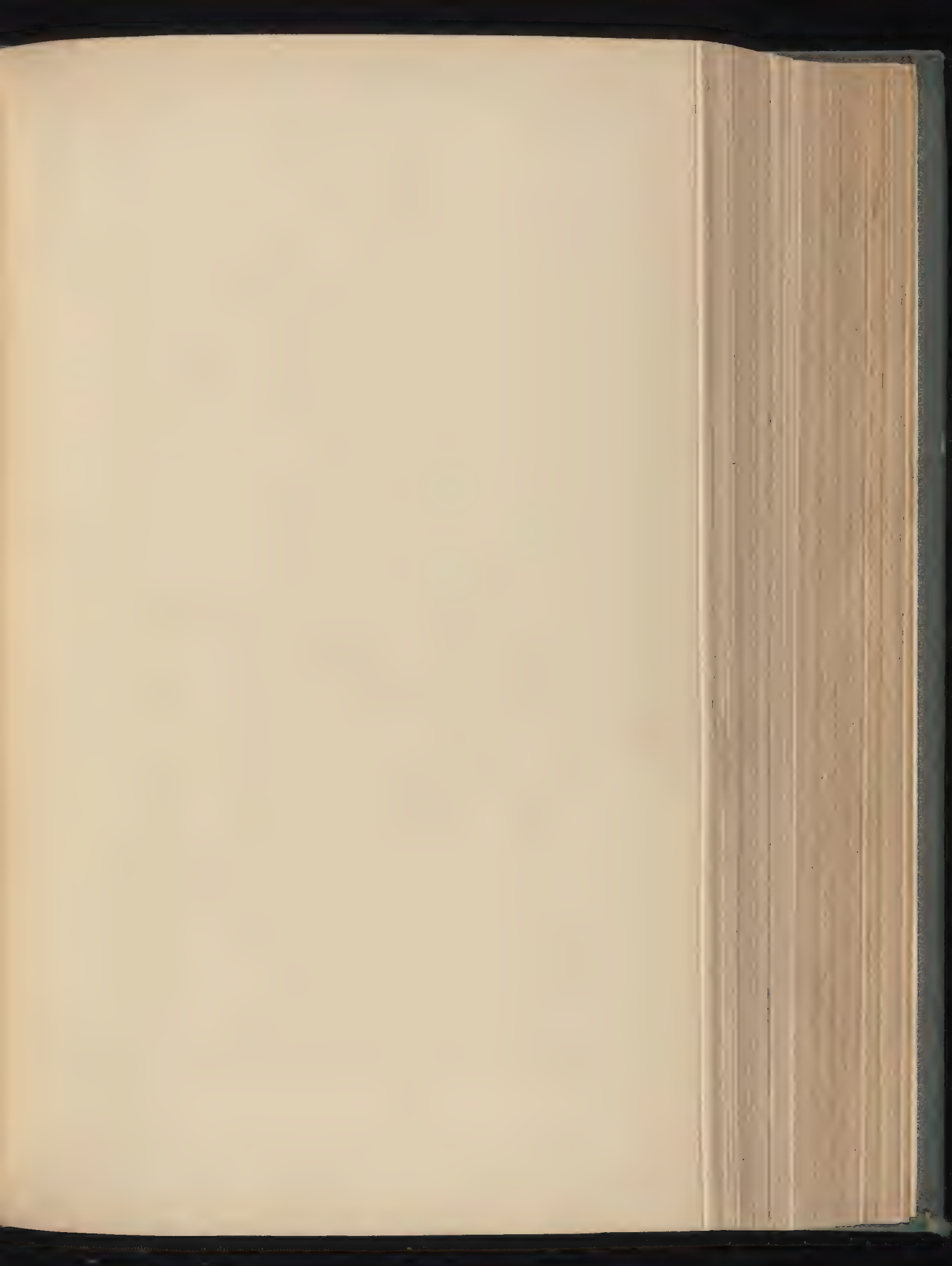
DESIGN FOR A WINTER GARDEN.—By MR. J. A. M. HUNTER.
PERSPECTIVE VIEW AND PLAN.

Gold Medal, Institute of Architects, 1905.



L'EDIFICIO della porzione di Nave di Travertemo esistente, e piantata secondo alle istruzioni che reggono il Tempio di Esculapio nell'Isola Tiberina, quale avanzo esiste in oggi in la punta dell'Isola sotto il Convento de Padri di S. Bartolomeo. Nella pianta veduto, che tutta l'Isola rappresentasse la forma di una Nave: la qual cosa non è possibile poichè prendendo la prospettiva da questo avanzo, tutto l'Isola farebbe stata grande la metà di una delle nostre cattedre di agnazione. A. W. Resto della Pigna esistente. C. Pila di Esculapio: egli ha la faccia rivolta dal Tempio e tiene accanto un Bastione col Serpe avvolgato. Che tanto si usava al trasporto in Roma di questo Idolo fatto paura di un Serpe fatto da Romani col mezzo di una Nave, avendo stato mandati a prendere per mezzo del Onicolo affine di far celare la povertà che in quel tempo gravava l'Invasione. D. E. Spazio tra l'Isola e la Riva. F. La Riva della Nave. G. Segno della Pigna. H. Resto del bastione esistente.

END OF THE TIBERINE ISLAND, AS DRAWN BY PIRANESI (circa 1750), SHOWING REMAINS OF THE PROW FORM IN MASONRY



THE BUILDER, FEBRUARY 25, 1905.

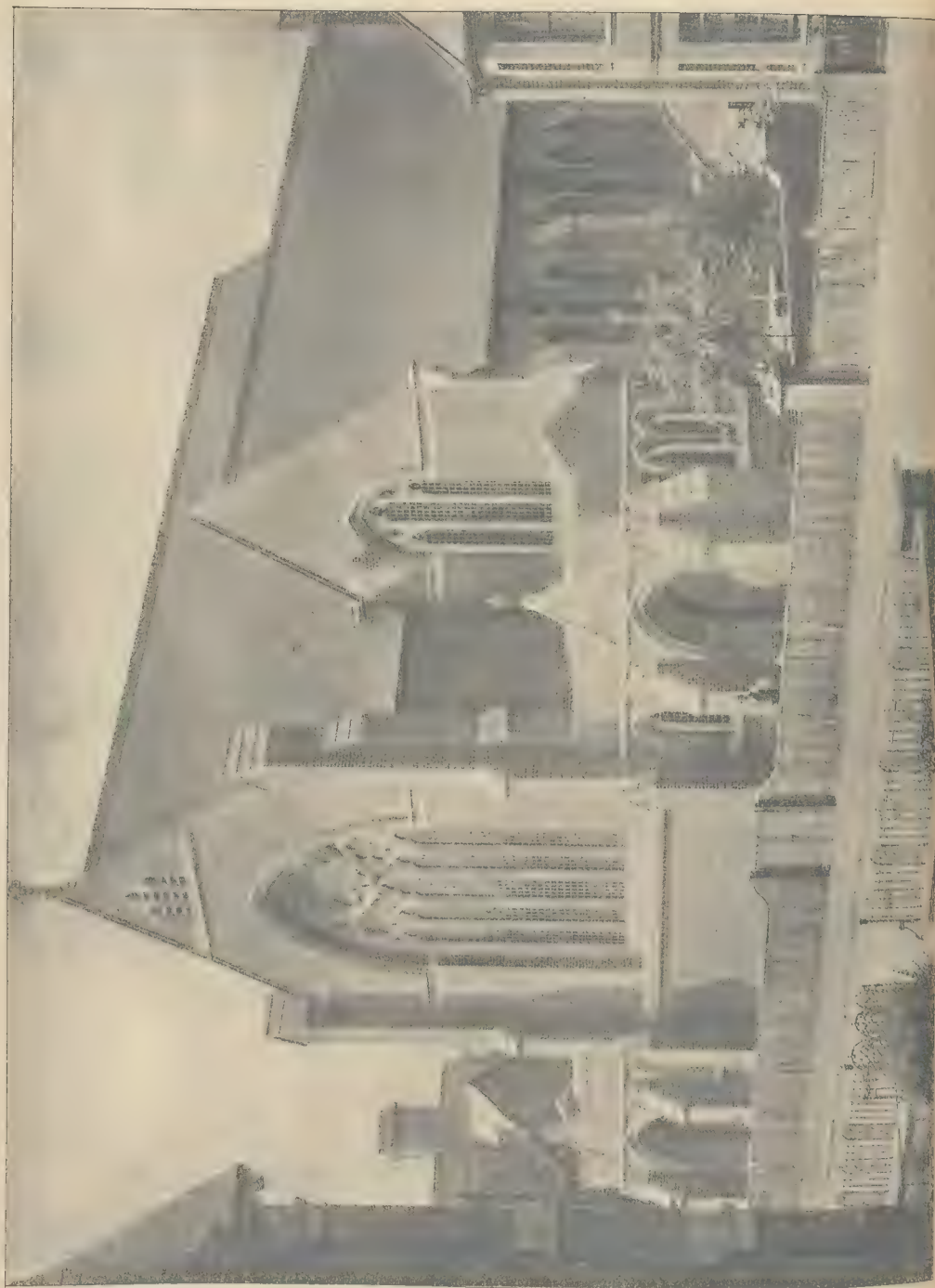




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The Builder.

VOL. LXXXVIII.—No. 3239.

MARCH 4, 1905.

ILLUSTRATIONS.

Temple of Jupiter, Baalbek	}.....From Drawings by Mr. R. Phené Spiers, F.R.I.B.A.
The Propylæe, Athens	
Interior of Hall of Columns, Esneh	
The Hall of Columns, Karnak	
Address Presented to Mr. R. Phené Spiers.....	Designed by Mr. Allan F. Vigers.

Illustrations in Text.

Medallion in Commemoration of the Presentation to Mr. R. Phené Spiers. Modelled by Professor Lantéri	Page 228
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The Building Act Amendment Bill and its Critics.

WHEN, some three months ago (see the *Builder* of November 19, 1904), we devoted some space to the consideration of the changes which would be brought about by the proposed new Building Act for London, we observed that our comments were based not on the actual wording of the Bill, which was not then published, but on the Report of the Building Act Committee of the London County Council, which only detailed the special points as to which alterations were proposed, and the nature of these alterations. Most of these we were disposed to regard favourably; at all events we saw nothing in them to give occasion for the hostile spirit in which the Bill has been assailed in many quarters, and in which professional interests have, with many critics, manifestly been put before public interests, which form the real business of such a Bill. But we certainly had not anticipated at that time that the proposed Bill was to take the form mainly of an elaborate amendment to the London Building Act (1894), that the two were to be read together, and that people concerned in building operations were to have the inconvenience put upon them of consulting and comparing the language of two Acts in order to find out their duties and liabilities. Yet such is

the case. The general form of the Bill as it now stands complete is, that wherever there is an alteration of a provision in the Act of 1894, we are referred back to that Act, and directed that such a clause in it shall be read and have effect "as if the words" so-and-so "had been inserted therein immediately after the words" so-and-so; the insertions consisting sometimes only of a word or two changing the purview or effect of a clause, sometimes of a whole long sentence constituting a new clause in itself. The excuse for this is, we presume, that a demand for an entirely new Act might probably be met by the criticism that the existing Act was not much more than a decade old, and that to require a new Act after so short a lapse of time was unreasonable. We can imagine no other explanation or apology for a mode of legislative enactment which is in the highest degree clumsy, inconvenient, and indeed preposterous. Whatever may be thought of the effect of the proposed legislation, the manner of it is entirely indefensible; it is placing upon those who are obliged to conform to it the onerous business of consulting and comparing two Acts before they can be sure what their obligations are. No such inconvenience to the public ought to be tolerated, and an important Bill drawn up on such a principle, whatever its effects may be, is self-condemned in regard to its form. If London building law requires so much amendment as is implied in this document—and we think it does—the existing Act ought to be repealed and whatever is retained of its

provisions embodied in a new Act consolidating the existing and amended provisions. So far we are entirely with the adverse critics, and we do not believe that a Bill drawn up in such a form can ever have a chance of passing.

This is not to imply, however, that we are by any means in sympathy for the most part with the opponents of the Bill. We object to its form, which is radically wrong; with much of its substance we are quite in agreement; and we object to the spirit in which it seems to have been opposed. The object of a Building Act for London is to benefit London and its public at large; not to benefit architects and surveyors or even their clients the building-owners, who after all are but a small proportion of the public. We are told that building will be rendered more difficult and more costly; but if that ensures better building and a better London, it ought to be rendered so. The objections embodied in the Petition of the Institute of Architects against the Bill, which have just been published in the *Journal* of the Institute, seem to go far too much on the assumption that the public are made for the architects, whereas in fact it is the architects who are made for the public: at all events, they will hardly get the public to think otherwise. And the summing-up sentence at the close of the Petition to the effect that "the public interest represented by the Institute" ("interests" we suppose it should have been) "and their own rights and interests are injuriously affected by the provisions of the Bill above referred to and that the Preamble of the

Bill so far as it relates thereto is incapable of proof," is not a wise statement to have made, and will not bear examination. Of course it is a usual conventional method of attacking a Bill to urge that its Preamble is not proved, or not capable of proof; but what is the Preamble of this Bill?

"Whereas the provisions contained in 'The London Building Act 1894' as amended by 'The London Building Act 1894 (Amendment) Act 1898' and the powers thereunder of the London County Council (in this Act referred to as 'the Council') are insufficient to secure the construction and maintenance of streets and buildings in the Administrative County of London in a satisfactory manner the provision and maintenance of proper means of escape in case of fire from such buildings and the reduction of the risk of fire in the case of such buildings.

And whereas it is expedient to amend the said provisions in the manner hereinafter set forth and to confer upon the Council such further powers with respect to the matters aforesaid and otherwise as are hereinafter contained.

And whereas the objects aforesaid cannot be effected without the authority of Parliament:—

That is a moderate statement enough, and on general grounds it cannot well be traversed. The phrases in the sentence from the Institute Petition, referring to "the public interest represented by the Institute" and "their own rights and interests" mean really, we take it, the same thing; the Institute petitions as a section of the public which considers the Bill injurious to its interests. In some senses it may be, and the Institute of Architects is an important body; but after all, Acts of this kind are not supposed to be framed in the interests of any corporate body, however important, but in those of the public at large.

The first thing we are struck with in the Petition of the Institute is an omission. Why did they not commence with the objection—"Here is a Building Act which does not define a building," one of the most absurd omissions that could be imagined in the Act of 1894, and which the present Bill does not propose to supply. One is really surprised that an architectural body should not have taken this opportunity of calling attention to such a manifest omission in the definitions prefixed to the 1894 Act, and which are to be accepted in the new Bill, which does not provide any "definitions."

The Petition, however, assumes that it is impossible to deal with details in recording the objections to the Bill, and goes on to classify the portions of the Bill to which objection is taken. The real case against the Bill is set out very well in the first portion of Clause 13 of the Petition:—

"13. Your Petitioners strongly object not only to the form of the Bill but to the manner of inserting by way of amendments to the existing Act additions deleting changes and new powers and provisions many of which are of such importance and so drastic and far-reaching in their effect as to render it not only expedient but necessary that they should be dealt with as specific and complete enactments. The method of setting out the new proposals in the Bill adopted by the Council makes it difficult to easily appreciate the meaning and probable effect thereof without continual reference to the Act of 1894. This in a measure dealing with the building laws applicable to so extensive and thickly populated an area is most objectionable and prejudicial to the interests affected thereby. Your Petitioners submit that the proper course would have been for the Council to repeal the existing Acts to consolidate and re-enact their provisions with such modifications as may be necessary and in this way to combine in one measure a complete and intelligible building code.

With all which we entirely agree; the remainder of the clause goes on

to elaborate the same argument, but we need not quote it further. The Petition then proceeds (Clause 14) to express dissatisfaction with the part of the Bill dealing with the formation and widening of streets, maintaining that many of the restrictions contained under this heading "are not required in the public interest," and "will prevent the natural and advantageous development of property in and the reasonable architectural development of the Metropolis." It would have made matters clearer if the Petition had indicated some at least of the provisions which they consider will have this unfortunate effect. As it is, we can only look through this portion of the Bill and endeavour to gather what it is that is objected to. But it is difficult to form any opinion as to this. Is it the substitution of 50 ft. for 40 ft. as the minimum width of streets? or is it the provision that the raising of a building which has been lawfully built "within the prescribed distance" should be regarded as a new building? If it is the 50 ft. street that is objected to, it is not creditable to the Institute to have raised an objection to what is really an enlightened move in the right direction: The majority of London streets are too narrow, whether considered from the architectural or the hygienic point of view, and we are glad to see any promise of a legislation which will lay the foundation of a wider street system. If it is the provision that raising the height of a building shall be considered as making a new building, that may no doubt be a grievance to the building-owners, but it is an advantage to the general public, and would give the Council a power of control in regard to heights of street buildings which is very much wanted. In either case we fail to see what is the injury to the Institute of Architects.

In its Clause 15, relating to the legislation on lines of Building Frontage, the Petition objects to the powers to deal with private rights conferred on the Council by this portion of the Bill. But unless they have such powers, how are they to form and to regulate the lines of new streets? The Petition states that the terms of compensation provided are "of a confiscatory character." We fail to understand the meaning of this charge, unless it refers to the provision (xxxi., 7 c.) that the compensation is not to be affected by any improvement or alteration made in the property after the notice of intention to claim it has been advertised in the manner legally provided, if such alteration or improvement "was not reasonably necessary and was made or created with a view to obtaining or increasing compensation under this section." We presume this is what the framers of the Petition consider to be "confiscatory." We should say it was a blow struck at a very vicious system of gambling with property, the money made by building speculators on this system coming, of course, ultimately out of the pockets of the rate-payers, in other words, the public. The provision is in the public interest; and in any case, what it has to do with the interests of the Institute of Architects, unless they wish to pose as a body of land and property jobbers instead of artists, we

fail to see. The only one of the proposed clauses that seems to us decidedly questionable is xxxii., 4, which provides that the Council may take any part of a house, building, or manufactory that they may require without being compelled to take the whole. This might in some cases lead to injustice to individual owners; it might be condoned by a special compensation, no doubt, but it is a rather drastic clause, and if there were any chance of the Bill becoming law, should be reconsidered.

The most astonishing thing in the Institute Petition is the second part of its Clause 16, of which we may say that we could hardly believe our eyes when we read it. It runs as follows:—

"The restriction now proposed by Clause 68 of the Bill that buildings should not be raised to a greater height than the width between houses on both sides of the street in which the building is to be erected is unfair and will seriously interfere with and retard the reasonable development of property in the older portion of London and will in many cases enormously reduce the value of the property affected and without adequate compensation."

A provision that houses should not exceed in height the width of the street is what all who take an enlightened view of either architectural effect or healthful conditions in cities have long recommended and desired; here is at last a proposal to carry it out, and the leading body of architects, instead of congratulating the London County Council on so wise an enactment, is the first to condemn it, on the mere grounds of what may be called the exploiting of property. Individual owners will be prevented from carrying their buildings as high as they want to and making as much money as they want out of a site; that is to be the first consideration, and the architectural effect of London and the public health are to be put second to it; and it is the Institute of Architects which promulgates this view! We can hardly believe that some of those whose names appear as formal signatories to the Petition have realised what they are signing; probably the Petition has been drawn up by a Committee which has been specially appointed for that purpose, and certain members of Council have had the duty of signing it; but we can only say that a clause such as that we have just quoted is not creditable to the Institute, and might better have been expected from a corporate body of auctioneers or estate agents than of architects.

The criticism (Clause 17 of the Petition) that the portions of the Bill dealing with "Construction of Buildings" contain a number of minor alterations for which no necessity can be shown and which "would cause great inconvenience in administering the Act" does not appear to us to be justified. We see nothing unreasonable in any of the proposed requirements; and as to "inconvenience," of course designing a structure in accordance with a number of legal requirements is always, in a sense, an inconvenience, but it is one which is inseparable from the proper regulation of buildings in cities.

With the Petition of the District Surveyors' Association against the Bill we feel more in sympathy. They have some reasonable grounds of complaint. They also object strongly in the first instance to the form of the Bill, expressing

their opinion that "the method of setting out the new proposals in the Bill makes it difficult to appreciate the meaning and effect thereof without continual reference to the Act of 1894." That of course is what is intended; but, as already observed, it is a most inconvenient manner of legislating. The most important clause in the District Surveyors' Petition is as follows:—

"9. Your Petitioners also object to the additional powers being conferred upon the Council under Part XIII. (Superintending Architect and District Surveyors) Clauses 127 and 128 provide for a certain event for the appointment by the Council of any surveyor or surveyors for the purpose of exercising the functions of the District Surveyor and authorise them to require District Surveyors to perform special services. Your Petitioners submit that it is and always has been the intention that District Surveyors should be competent and professional men of experience and independence able to undertake the responsibilities for which they have been specially trained and are fitted and that they should be free within limits to exercise a reasonable discretion in the discharge of their duties. In order to ensure this degree of competency in the persons appointed to perform the duties of District Surveyors the Act of 1894 requires that candidates for that office shall be qualified by examination and hold the certificate of competency of the Royal Institute of British Architects. Your Petitioners submit that the provisions contained in Part XIII. and other parts of the Bill will if sanctioned tend to greatly lower the status of District Surveyors whereas it is essential in the interests of the public that the independence of action by District Surveyors should be maintained and their position as statutory officers upheld."

This is we think a reasonable protest, by no means uncalled-for; and we also entirely sympathise with the Association in their objection to the power proposed to be given to the Council by resolution to change the statutory name or title of "District Surveyor." We can see no reason whatever for contemplating such a change, or for doing away with a well-understood title which has acquired an honourable signification. The District Surveyors of London, as a body, have done their work admirably, and are entitled to the confidence and support of the public; and the proposals relative to them in the Bill are hardly what they had a right to expect. We do not, however, concur in their protest against the suggested institution of salaries in place of payment by fees. In our opinion payment by salary is the more suitable system; and the present arrangement of payment by fees, in other words "payment by results," though we do not say that it has led to any abuses, is apt to make people think that it may do so, which is undesirable from every point of view.

As we have said, we think the form of the Bill fatal to it, and that on that account it cannot possibly pass into law. But we do not think it is open to much serious criticism as to its proposed effect, and the opposition it has encountered can hardly be said to have been inspired by regard for public interests, which are what such a Bill is rightly concerned with.

HOUSE OF COMMONS.—Mr. C. J. Williams, etc. of the works, has carried out some improvements at the House of Commons by removing the reporters' gallery refreshment buffet to the topmost floor of the clock-tower wing, where it is now level with the reporters' dining-room, over the members' entrance. The alteration will give more space in the ladies' gallery corridor, which affords access to a series of the writing-rooms, and the general entering is henceforth to be conducted at a corner between the principal smoking-room and the dining-room.

NOTES.

The Thames Barrage Scheme. AS IT stands the Thames Barrage Bill proposes the constitution of a Port Commission having power to construct a barrage at Gravesend if such a work should appear to be desirable. The permissive character of the suggested authority is no drawback, and as a body representing those whose interests are centred in the Thames it would have ample scope for useful work. But it is by no means improbable that the new body might decline in the end to carry out the scheme which is the real objective of the present Bill. The dock companies do not appear to look upon the measure with favour, and, as they have much to gain by its realisation if the scheme be good, and much to lose if it be bad, their views clearly deserve attention. Foremost among the objections raised on their behalf is the loss of motive power now supplied by tidal action. Steamship owners might not be seriously inconvenienced by alteration of the existing conditions, but the proprietors of sailing barges, which constitute two-fifths of the vessels passing Gravesend, might have something to say, and it seems to us that the barrage would most likely have the effect of increasing the cost of various supplies and particularly of cement coming from the lower reaches of the river and from the Medway. As to the adequacy of the locks for dealing with traffic there are reasonable grounds for apprehension. Even granting the possibility of dealing with existing traffic by distributing it over the twenty-four hours, the promoters of the project have to show that ample accommodation can be afforded for extensions of business in years to come. These points are quite apart from purely engineering problems, which, as we have before said, are difficult of solution and upon which no precedent exists for guidance. London is not a fit subject for experimental work unless successful results can be confidently anticipated.

EXPERIENCE in the United Kingdom. States seems to agree very closely with our own as to the lax manner in which specifications are frequently drawn. The writer of an article in an American contemporary says that, when anything out of the ordinary course is to be contracted for in architectural or engineering work, most specifications are such that intending contractors are often obliged to ask for supplementary information, and not infrequently to obtain necessary data by visiting the site of the proposed works. It ought to be perfectly easy for a designer to say what he wants in clear and simple language, and to express all his requirements under properly classified headings. Unfortunately, the task appears to be one of the most difficult falling to the lot of the architect and the engineer. It may be that principals themselves are not incompetent, but leave too much to their assistants, and in that case the obvious moral is that an important branch of education is being overlooked by technical colleges and schools. Apart from this aspect of the question, our experience is that much of the confusion existing in the average specification results from the attempt to save trouble by using some old and not altogether applicable specification as a basis for the new document to be written. The designer should remember that the more trouble he gives to contracting firms, the higher is the price his client will have to pay. This reflection ought to make clear the point that the skilful writing of a specification is a most important part of his duty.

Damage to Roads.

AN interesting point was recently raised in the case of *The Kent County Council v. Corporation of Folkestone*, which was an action brought by the Council, as the road authority, to recover damages or expenses from the Corporation for extraordinary traffic on the highways. The defendants were widening one of the roads in their jurisdiction and the damage to the road was caused by the hauling of stone by means of traction engines to the place where the work was being carried out. The work was commenced in December, 1902, and was completed some time after the action was brought. The stone was hauled under a contract made with a contractor, commencing in April, 1902, and the work under this contract was completed in March, 1903. The action was commenced in February, 1904. The question which came before the Court of Appeal for decision was whether the action had been commenced within the time prescribed by certain statutes. The defendants had set up the Public Authorities Protection Act, 1893, which only allows actions to be commenced against public authorities "within six months next after the act, neglect, or default, complained of"; but under the Locomotives Act, 1898, there are special provisions regulating the time within which proceedings must be taken to recover expenses and damages—"twelve months of the time at which the damage has been done or when the damage is the consequence of any particular building contract or work extending over a long period not later than six months after the completion of the contract or work." The Court of Appeal decided that this latter Act does not overrule the earlier statute of 1893; but, unfortunately, the Court was not called upon to give any decision showing how the two statutes are to be reconciled, for they held that the Public Authorities Protection Act, 1893, had no application to the facts of this case, since the contractor who did the damage was not a servant of the defendant corporation. In the result, the Court awarded damages 50%, that being the amount of damage assessed to have occurred since the action was brought, and the decision is to the effect that the action must be brought under the Locomotives Act within twelve months, and that the latter words of the section only operate to extend that time when this period would operate oppressively. The section is a typical sample of recent legislation expressed in terms incomprehensible to the lay and legal mind alike.

WE are glad to note that the Electric Supply of London, and other municipal authorities are fully alive to the far-reaching consequences of the Electric Supply and Power Bills introduced into Parliament this session. One of the proposed power companies, which will have a capital of five millions, is to supply electric energy in Middlesex, Surrey, Essex, and Kent, as well as in the whole of the County of London. If the companies have their way, the supply of electric energy in London will be revolutionised. Several of them propose to sell energy at prices well under a penny a unit, and so the five and a half millions which have been invested by the Metropolitan Borough Councils in electric supply undertakings will be very seriously depreciated. In most cases, in the event of the local authority refusing permission to a company to supply a consumer, the company seeks to obtain the right of appeal to the Board of Trade to grant them permission. The Board of Trade would doubtless give them this permission if the existing undertakers were not able to supply on reasonable terms or within a reasonable time. As a general rule, also, the proposed undertakings are not to be subject to any power of purchase. In that case, the inevitable consequence will be the creation of a company which will have a practical monopoly of the electric lighting of London. The proposed limiting of the maximum dividend to 8 per cent. is no cure for the evils arising from a private monopoly affecting so many interests. The matter is urgent, as we are convinced that the supply of electricity in bulk is both feasible and profitable. What electrical engineers call the "diversity factor" of this kind of supply is very high, since the energy can be supplied for many purposes, and so on a suitable site it can be generated very economically. Not only are the municipal supply undertakings in the metropolis threatened by the proposed legislation, but also many of the supply companies. It has been suggested that the London County Council should be the authority for supplying electricity in bulk to London. We think that the existing companies would do well to arrive at some arrangement satisfactory to the Council whereby consumers can have a supply of electricity on the most economical basis.

THE case of Neale v. East Ham Urban District Council, recently tried before Mr. Justice Ridley and a special jury, raises a question of some importance to the public. The plaintiff was an outside passenger on one of the defendant's tramways; the tramways are worked by an overhead trolley wire, and electricity is conveyed to the tram by an arm with a wheel running on the trolley wire. The wire snapped and a portion of it struck the plaintiff on the head, and his cap was burnt by the electric current, and he sustained a severe electric shock, and was otherwise injured. The plaintiff contended that the mere happening of such an accident was evidence of negligence on the part of the defendants, and, in addition, alleged that a covering should have been

supplied to provide for the safety of the passengers. The defendants' case was that the wire was the best that could be procured, and that it was tested before it was put up, and examined once a week, and that the flaw could not have been discovered, and in the result the jury found for the defendants. In view, however, of the number of accidents that have occurred in connexion with this system of electric tramways the question to be tried seems rather a wider one than whether the defendants have exerted due care in the working of the system, and to resolve itself into whether such a system should be adopted at all. The Tramway Companies are compelled to provide for the safety of their passengers, but they are even under a greater obligation to numbers of the public using the streets, and should be compelled to use the system which assures the greatest safety to both classes of the public.

IN rapid succession, one London Street Traffic. after another of the omnibus companies and other owners have decided upon the adoption of mechanically-propelled vehicles, until there now seems a probability that in a very short time the horse will be abolished for drawing public conveyances of the class indicated. This development has raised the hopes of those who believe that mechanical traction will become universal in the streets of the metropolis at no distant date, and enthusiastic supporters of automobilism are already discussing new types of road pavement suitable for the anticipated reform. Perhaps it may be useful to consider improved forms of paving in about twenty years hence, when we shall better be able to form an opinion as to how far any radical change in road construction may be practicable. In the meantime, however, motor omnibuses threaten the tramway system with competition of the most formidable character, the effects of which will probably be felt by ratepayers before very long. The new development demands consideration by the Royal Commission on London Traffic, and should be taken seriously into account by the County Council before any further expenditure is sanctioned on tramway extensions.

SOME recent building operations at Islington go to show that the Postmaster-General does not consider himself to be bound by the provisions of the Disused Burial Grounds Act of 1884 and the Open Spaces Act of 1887. A leading champion in the defence of such open spaces was, and, we believe, still is, legal adviser to the Post-Office, and it is true that the prohibition against building for other than church-extension upon land which comes within the purview of the statutes is not in express terms rendered applicable to the Crown. It seems, then, that the Post-Office authorities in erecting some premises upon a disused burial-ground in Church-street, near Islington-green, have not broken the letter of the law. Nevertheless their action indicates that, under existing conditions, the burial-grounds of London, which are gradually being acquired and

protected at a great cost and under considerable difficulties, are not absolutely safe from intrusion or appropriation.

THE City Council of Worcester propose to secure for purposes of a public recreation-ground the site of the Fort Royal, which was constructed in the time of the Parliamentary War, and presents many vestiges of its earthworks and circumvallation. The Council are also minded to acquire the buildings of the adjacent hospital, known as the "Commandery," which Bishop Wulstan founded at Sibbury, in the south-east parts of the city, temp. William II., for poor brethren. Cardinal Wolsey appropriated the foundation, with others of the same kind, for his two colleges at Ipswich and Oxford; Henry VIII. bestowed it upon Christ Church. The existing buildings comprise the large XVth century hall, which, albeit mutilated by a carriage-way at its west end, retains much of the carved work of its open hammer-beam roof. The upper apartments, fitted for the most part with oaken panelling, comprise the Prior's room from which is entered a small reading-loft that overlooks the refectory, King Charles I.'s bedroom, the Council Chamber, the Solar, or Lord's room, and in the roof, at the top of the staircase, a secret recess or loft—a hiding-place reputedly of King Charles II. An elaborately-carved chimney-piece in one of the rooms bears the arms per pale of Wilde and Berkeley. Thomas Wyde, clothier, leased the property from Christ Church, Oxon., and in 1577 a William Berkeley built the half-timbered house in New-street, which also is associated with Charles II. and the story of the battle of Worcester. After the fight on September 3, 1651, the wounded Duke of Hamilton died in the Commandery. Thirty-five years ago the buildings were converted into a college for the blind by the late Rev. R. H. Blair; the college migrated in 1887 to Powick in the suburbs, and they have since been occupied by a firm of printers.

At the Fine Art Society's Gallery is a collection of water-colour drawings of "Cloveley and other places," by Mr. Hugh L. Norris, an artist whose name is new to us. These show admirable qualities in regard both to composition and colour, the latter especially. They are in the rather "washed-out" style, if we may so call it, which is affected by many of the younger school of water-colour painters, and in which the various elements of a landscape are treated as expanses of colour rather than as substances having special texture. This generally leads to a want of power in foregrounds, and in this case also a want of reality in the representation of sea, which comes into a good many of the views and is in almost every case the weak point of the picture. A mere wash of rather vague colour does not really represent sea; one only accepts it because, from the nature of the composition, it is obvious that it must be meant for the sea; apart from its position in the composition it would convey nothing. As long as the author keeps on land

however, his work is always interesting. The view of "Clovelly from the Hobby Woods" (18) is a beautiful piece of colour. No. 31 shows nearly the same composition under a different and colder light. Among others that we specially liked are "The Hay Cart" (2); "The Avon from Sandbolls Wood" (10); "Willows" (11)—the character of the trees well given; "Looking over Clovelly Park" (41); "The Avon below Hale" (45); and "A Stretch of the Avon" (48). In the Clovelly views the artist has got the poetry of the place, if not all its picturesqueness in detail.

The exhibition of the works of the French Impressionists at the Grafton Gallery is succeeded by an exhibition representing the most opposite artistic character—that of the oil paintings, with a few bits of sculpture, by Mr. Emil Fuchs. The paintings are mostly portraits, highly finished but in a hard and matter-of-fact style (those of men especially) with which we have little sympathy. The painting called "A Hasty Impression" (42) is more attractive as a work of art than the finished paintings, as it shows freedom of line and breadth of style. Of the larger and highly-finished works the most effective are the portrait of Miss Kaufman (3) in a red dress, and that of Madame Sager (4), which has dignity and an expressive head. Dignity is not wanting in the others, but the style is dry and mechanical. Among the sculptures is a pretty bas-relief, "In the Spirit of Olden Times" (15), a Madonna and Child in fact, rather out of keeping with the prevalent style of the collection, and a portrait figure of Lady Victoria Grenfell.

A SMALL exhibition of miniature Dowdall's Gallery. tures at Messrs. Dowdall's Gallery is made the occasion for the revival of a rather absurd fashion which once obtained, of painting a miniature of the eye of a person only, or, as in one or two instances here, the eyes of a whole family. Cosway is said to have set the fashion, having painted for the Prince Regent a miniature of the eye of Mrs. Fitzherbert, which he was to wear as an ornament. Some collections of eyes by Cosway and Engleheart are exhibited, and they are certainly beautiful examples of minute and careful execution; but the idea was hardly worth reviving. We can feel more interest in the complete miniature heads by Mr. Alyn Williams, some of which are very beautiful; we may particularly mention "The Viscountess Dupplin" (11), a *spirituelle* head with a cloud background, and "A Study of a Child's Head" (14), also very expressive. All the miniatures by Mr. Williams are finely executed, and excellent examples of a fascinating branch of painting.

CANON LESTER MEMORIAL, LIVERPOOL.—Mr. George Frampton, R.A., has been commissioned to execute a statue of the late Canon Lester, which, when completed, will be placed on a site in St. John's Gardens, Liverpool. The statue, in bronze, will be 10 ft. high, and the stone pedestal 12 ft., giving a total height of 22 ft. The cost of the memorial will be £600.

DINNER AND PRESENTATIONS TO MR. R. PHENÉ SPIERS.

A VERY interesting and indeed memorable gathering took place on Monday evening, when a dinner was given to Mr. R. Phené Spiers, and an address and a number of gifts and memorials of different kinds presented to him, in testimony of the esteem felt by many for his abilities and his architectural knowledge and research, and also in recognition of the constant and willing assistance which he has during his whole life given to architectural students from all parts of the world.

The history of the inception of this movement on the part of his professional and other friends is sufficiently indicated in the speeches reported below, and space is wanting for us to say more here than how heartily we are in sympathy with the feelings which prompted this manifestation of regard. Mr. Spiers has all his life worked for the good of architecture and architectural education and not for reward; we are quite sure that he was the last person to expect a demonstration in his honour; it was totally unsought by him; and the occasion was a gratifying instance of the fact that work done in a spirit of thoroughness and for its own sake does not always, even in this world, fail of its appropriate reward, if not in money, in something which is more than money; for we are sure that in the enthusiastic recognition of Monday, and the memories of old kindnesses and old friendships which waked up again from far-off years, Mr. Spiers must have felt fully recompensed for his services in the cause of art and architecture.

The dinner was held on Monday at Pagan's Restaurant, Nos. 42-48, Great Portland-street, W. Sir Aston Webb presided, and there were also present:—

M. J. L. Pascal (Member of the Institute of France, representing the "Société Centrale des Architectes Français"), Mr. John Belcher, A.R.A. (President of the Royal Institute of British Architects), Sir John Taylor, K.C.B., Sir L. Alma Tadema, R.A., Sir William Emerson, Sir Henry Tanner, Sir Charles Holroyd (Keeper of the Tate Gallery), Mr. Walter Crane (President of the Arts and Crafts Society), Mr. Ernest Crofts, R.A. (Keeper of the Royal Academy), Mr. Fred Eaton (Secretary of the Royal Academy), and Messrs. Ernest George, Maurice B. Adams, Louis Ambler, W. Ammonier, R. S. Ayling, R. S. Balfour, Sidney H. Barnsley, Herbert Batford, F. D. Bedford, H. P. Berlage (Amsterdam), W. H. Bidlake, Reginald D. Blomfield, A.R.A., C. Bosom, H. Branch, J. J. Burnet, A.R.S.A., W. D. Caröe, A. H. Christie, C. R. Clark, S. F. Clarkson, Douglas Cookrell, T. E. Colcutt, R. W. Collier, H. C. Corlette, H. G. Creswell, T. G. Davidson, A. Davis, E. Guy Dawber, M. Duquesne, Alfred East, R.A., George Elkington, Frank Fox, George Frampton, R.A., J. Fulleylove, R.L., Theodore Frye, James Gandy, H. L. Goddard, W. Curtis Green, E. A. Grunsig, Edwin T. Hall, T. E. Harrison, George Harvey, Charles Henman, Gerald Horsley, E. R. Hughes, A. R. Jemmett, W. Goscombe John, A.R.A., Professor W. R. Lethaby, W. G. B. Lewis, W. J. Locke, H. W. Lonsdale, Bertrand Loud, E. Falconer MacDonald, C. E. Mallows, E. Margateon, F. W. Marks, H. P. G. Maule, E. J. May, Walter Millard, John Murray, William Murray, Ernest Newton, Philip Norman, Siegfried Owen, A. M. Paterson, James Paxton, M. G. Pecheil, Graham Petrie, Professor Beresford Pite, E. E. Pither, F. L. Pither, Rowland Plimbe, W. T. Plimbe, A. N. Prentice, T. E. Pryce, T. M. E. Rickman, Lucy W. Ridge, C. E. E. Sayer, H. Weir Schultz, H. D. Searles-Wood, Professor F. M. Simpson, J. W. Simpson, Atherton Smith, Professor R. Elsey Smith, Stanley W. Smith, W. H. Seth Smith, G. T. Smith, Solomon J. Solomon, A.R.A., Frank Spiers, Walter Spiers, T. R. Spence, S. J. B. Stanton, Hugh Stannus, H. H. Statham, Leonard Stokes, J. van Straaten, jun. (Amsterdam), E. F. Strange, Arthur Stratton, C. J. Tait, H. Tanner, jun., Arnold S. Taylor, C. Harrison Townsend, F. W. Troup, Sidney Vacher, F. T. Verity, Rmery Walker, E. P. Warren, A. M. Watson, T. H. Watson, Bernard H. Webb, T. B. Whinney, H. H. Wigglesworth, E. W. M. Wonnacott, W. Woodward, and A. B. Yeates.

After dinner, the toast of "The King" having been honoured,

The Chairman briefly asked the company to drink to the health of their honoured guest, Richard Phené Spiers.

Mr. Spiers, in reply, said that as he was to address them fully later on, he would do no more than express his gratitude to them for that extraordinary assembly, and the delight it gave him to see a much greater number of his friends than he had ever seen together in a single room.

This part of the proceedings then terminated. While the tables were being cleared and re-arranged for the presentations, Mr. Spiers held an informal reception of his friends. The various gifts were then brought in by a procession of Old Students of Mr. Spiers, and the presentations were made by the Chairman, and by M. J. L. Pascal (on behalf of the "Société Centrale des Architectes Français" and of the "Atelier Blouet-Gilbert-Questel-Pascal, Paris).

Mr. R. W. Schultz first read a number of letters and telegrams expressing the regret of

some of Mr. Spiers' friends who were unable to be present.

Professor Aitchison wrote:—"Will you be kind enough to make my excuses on the ground stated [doctor's orders], and to say that I think we are greatly indebted to Mr. Spiers for investigating the methods of teaching in the various Continental schools, and thus enabling the Royal Academy to open a school which did not exist when I was a student. It has not only been the means of improving the work of those blessed with architectural invention, but has also brought to the notice of the Academy men possessed of this gift that was quite unsuspected when they first entered."

Professor Capper wrote:—"I need not say how warmly I sympathise with the gathering; if opportunity offer, please convey an expression of this hearty sympathy, coupled with loyal good wishes of every kind to the teacher to whom so many of us gratefully look, unknown to him, in our work of teaching, day by day."

Professor Ware (Massachusetts) wrote:—"Ever since I first met him in 1866, when he had just returned from Paris, and I was in London, getting hints about architectural education, he has been a constant friend and helper, both to myself and to my students, and it is a great satisfaction to know that his services are to receive this recognition."

Mr. Frank Miles Day, New York, wrote:—"When a student in London more than twenty years ago, Mr. Spiers was most helpful to me by his advice, and, if I am not mistaken, influenced my career considerably by what he said to me. It gives me the greatest pleasure, therefore, to enclose the vellum slip for attachment to the memorial."

You will be glad to learn unofficially through me that, at the recent convention of the American Institute of Architects, the Board of Directors recommended Mr. Spiers for honorary membership, not only on account of his scholarly attainments, and the contributions he has made to architectural education in England, but because of the wise counsel and friendly assistance which he has so often given to American students of architecture while in London."

Mr. Gibson, of New York, wrote:—"I am glad to learn that an address is to be presented to Mr. R. Phené Spiers; and I consider it a privilege to be included among those who will sign it. I regret very much that the length of the journey and the demands of business will prevent my coming to London to be present at the dinner. Nothing would give me greater pleasure, and I hope that you will transmit to Mr. Spiers my sincere and cordial greeting, and the assurance that I continually remember not only his able and kindly and tactful tuition I was one of his students at the Royal Academy, but I have also the liveliest appreciation of the fact that it is partly due to his advice and information that I came to America, where I found opportunities which could not have been expected at home. No doubt Mr. Spiers will recollect me even among his hundreds of friends, and to think that he will be a great pleasure to me."

Mr. Schultz said that the list represented not only Englishmen, Scotsmen, and Irishmen, but gentlemen of all nationalities. This little movement had received the heartiest sympathy from all parts. They had received letters from the Colonies, India, America, Spain, Italy, France, Holland—from almost every European country, and also from several Japanese students who had come under Mr. Spiers' influence. Amongst those who had written or telegraphed were Professor Aitchison, Professor Capper (of Victoria University, Manchester), Professor Lanteri, Professor Baldwin Brown, Professor W. R. Ware (of Massachusetts), Professor Miles Day (Vice-President of the American Institute of Architects), Dr. Cuypers and Jan Stuyt (Amsterdam), and Messrs. R. Norman Shaw, A. T. Bolton, Walter Cave, H. D. Davis, E. M. Gibbs (Sheffield), Sir Thomas Drew (Dublin), R. W. Gibson (New York), J. A. Gotch (Kettering), W. Banks Gwyther (Calcutta), T. G. Jackson, T. Rogers Kittell, J. A. Morris, F. Massey (Cape Town), S. Hurst Seager (Christchurch, New Zealand), Kotaro Sakurai (Japan), W. A. Pite, J. J. Stevenson, T. Worthington (Manchester), Allan Vigers, and many others. Mr. Schultz then brought forward the illuminated address to Mr. Spiers, the first page of which we publish among our illustrations this week. He said it contained over 300 signatures of British architects, five of architects in India, twenty-four from the Colonies, fifteen from the

United States, three from France (in addition to an address sent by the Société Centrale des Architectes Français), four from Japan, and a number of others. Mr. Schultz concluded by reading the address.

Professor Pite then presented a large medallion portrait of Mr. Spiers, which had been modelled by Professor Lanteri; an illustration of it is given here. He said he had the honour to present the medallion which they had subscribed to their dear friend Phéné Spiers. Professor Lanteri had expressed the pleasure he had had in having sittings from Mr. Spiers, and he was prevented by illness alone from being present that night.

Mr. E. Guy Dawber, President of the Architectural Association, next presented a small medallion portrait of Mr. Spiers.

Professor Lethaby followed with a volume of the collected essays by Mr. Spiers. He said he had great pleasure in offering, on behalf of the Committee, a copy of Mr. Spiers' essays, which had been got together under great pressure and difficulty in a very short time by Messrs. B. T. Batsford.

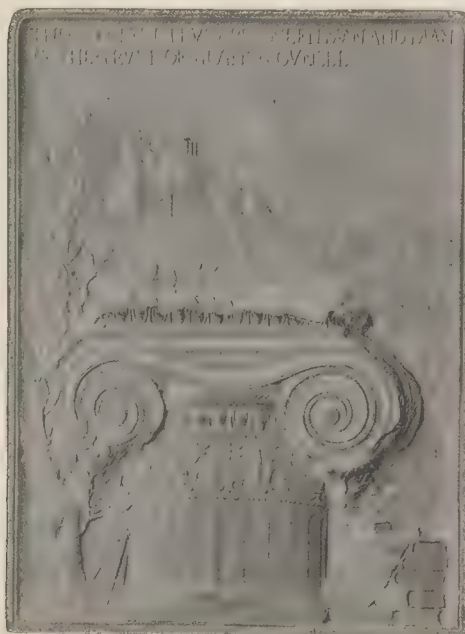
insisting on that subject, and, the field being clear, he could celebrate the services he had rendered to his (M. Pascal's) compatriots at such times as they needed information, help, or personal attention while in England.

"That is why I remit you the commemorative medal struck in your honour by the Central Society of French Architects, to which you belong as corresponding member. Aside from signifying the gratitude for the cordial, efficient, and active relations which you have had with this Society, it honours with its respect the man, the distinguished artist, the zealous archaeologist, and the earnest teacher who placed before the practical and productive career the ideal disinterestedness of the professor and theorist. The signatures here grouped promiscuously on a sheet of paper are far from representing all those which might have been obtained. . . . The old friends of the Atelier Questel in which you studied at the Ecole des Beaux Arts of Paris, an atelier reaching back more than fifty-five years in the same old house, with four successive professors—Blouet, Gilbert, Questel, and your old com-

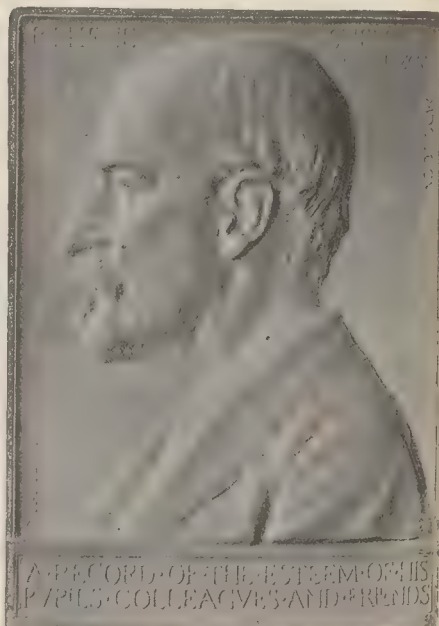
In the midst of the praises which ought to be recounted, since we are here only to celebrate your affability, your devotion for the young, your varied and necessary labour, your knowledge, your fraternal feeling, and all that occasion this banquet, I was the only one who could bring, with the south wind, echoes of your youth, the remembrance of student comrades, and this living proof that the cordial understanding of our two nations is not so new since we practised it some half a century ago."

Mr. J. J. Burnet said it afforded him and his colleagues (Messrs. Sayer, Paterson, and Davis) great pleasure in representing the atelier of Questel, and they had much pleasure in handing their gifts to Mr. Spiers.

The Chairman said it only remained for him to ask their friend and guest to accept the various testimonials which had been laid before him as some small token of the esteem and friendship in which they held him, and in which they had always held him. The committee had tried to depart somewhat from the usual form of proceedings of this sort, because they thought that the occasion was somewhat an unusual one.



Medallion in Commemoration of the Presentation to Mr. R. Phéné Spiers. Modélled by Professor Lanteri.



The following books were then presented to Mr. Spiers by former Academy students, i.e.:—
Chotzy: "L'Art de Bâti chez les Romains."
Chotzy: "L'Art de Bâti chez les Byzantins."
De Vogüé: "Temple de Jérusalem."
De Vogüé: "Syrie Centrale, Architecture Civile et Religieuse."
Wood: "Ruins of Baalbek."
Coner: "Sixteenth Century Drawings of Roman Buildings."
Longfellow: "Cyclopædia of Architecture in Italy, Greece, and the Levant."
Jackson: "Dalmatia, the Quarnero, and Istria."
Butler: "Architecture of Northern Central Syria and the Djebel Haurân."
Schultz and Barnsley: "The Monastery of St. Luke of Strips in Phœnicia and St. Nicholas-in-the-Fields."
Jameson: "Works on Sacred Art," 6 vols.
De Caumont, Abbé d'Archevêque: "Rudiments d'Archéologie."
Ryhs: "Monogr. ph on Lord Leighton."
Prior: "History of Gothic Art in England."
Murray: "Sculptures of the Parthenon."
Venturi: "Storia dell'Arte Italiana."

The Chairman explained that the books were what Mr. Spiers had selected as representing those he would like to add to his library, and the books were being brought up by old students.

Another presentation was a laurel wreath. M. Pascal then made the presentation of the Société Centrale des Architectes Français and the Atelier Blouet-Gilbert-Questel-Pascal, Paris. He said that the praises given to Mr. Spiers for his exemplary life relieved him from

rade here present—offer you the first three volumes of 'L'Architecture Française de Blondel' published under the auspices of our Ministère des Beaux Arts; the fourth volume will soon follow. Amongst the honours which are conferred upon you, the one which will affect you most deeply, and certainly the most agreeable for me to transmit to you, is the recollection of our younger days. I am ignorant of what passing years have made of your gaiety, of your good humour, but I hope not to describe another man than the one which your pupils know when I recall the jolly companion you used to be. We owe to our continual association with youth more than it owes us. May the young men who surround me here have preserved you as we used to know you. We called you 'My lord,' because a custom—which I do not defend—demands that a nickname should replace the family name in the daily relations of our affectionate and practical joking French comradeship; and the term brought the air of dignity, of reserve, a little haughty, of the British subject in the midst of the spontaneity of his youthful gaiety into harmony with ours. You were a great worker; but with our young artists work does not go without some fun, and you were of too good company not to appear to put yourself in accord with us.

When he had the honour last year of being President of the Institute he found that there was amongst the members a general desire to do something of this sort, and while he was arranging it he heard from Mr. Schultz, who said that others were also thinking of the same thing. He at once gave up his scheme as he felt a testimonial of this sort would be better disconnected from any institution, and Mr. Spiers might feel assured that it was the spontaneous wish of his brother architects of all shades of opinion to do him honour, and it must be a satisfaction to all that there should be such a representative body there that night for that purpose. The occasion was unique—partly on account of the international character it had assumed, as was shown by the signatures to the address—and partly because of the presence of M. Pascal, who had come from Paris on purpose, and who, unfortunately, was able to be here only a short time, and to whom they could not, therefore, offer their hospitality as they would like to do. He thought they would like him to express to M. Pascal the great homage they all paid to French art, and especially so when that art was the art of architecture, and was represented by so distinguished an architect as M. Pascal, and to assure him that his presence was greatly appreciated by them. There could

BAPTIST SUNDAY SCHOOLS, HILLSBOROUGH, SHEFFIELD.—The memorial-stones in connexion with new schools being erected by Hillsborough Baptist Church, Sheffield, were laid on the 23rd ult. The buildings are situate in Hawthorn-road, opposite the chapel, and will consist of an assembly hall and six classrooms, five of which can be thrown into the main hall by means of revolving shutters, thus providing accommodation for 600 persons. The entire cost is estimated at 1,450l. The joint architects are Messrs. F. W. Chapman and H. L. Paterson.

Good plumbers are naturally proud of their

work, and do not like to have it hidden away, now, if we make use of this pride on their part and take an interest in their work, they will make a very creditable show, which can be made to harmonise with the surroundings and be too good to be covered up. If the architect shows that he appreciates and takes an interest in their individual work, it will encourage good artificers to execute it with special care, with the happiest results. This present craze for unduly hastening work, which only disheartens the workers, is responsible for much of the bad work frequently met with.

There is one other point I wish to call your attention to. Do not, as, I am sorry to say, many architects do, hand over drains and fittings to a merchant or manufacturer to carry out.

I propose now to refer to:—

1. Water supply and fittings required for the effective working of the water-carriage system of drainage.
2. Soil and waste pipes.
3. Drainage for soil and rain-water.
4. Land drains.
5. Stables, cowhouses, and dairies.
6. Disposal of sewage.

Water Supply, Cisterns, etc.

☞ The source from which water is derived may be either collecting ground on moors, hills, etc., or artesian or deep wells, the latter being the most general. Great care must be exercised in selecting the wells which are to supply the drinking water.

There are country towns where the water is supplied by a water company to many houses, while the remaining are still supplied by wells, and it is no rare occurrence to find the disused wells of the former turned into cess-pools, with very serious results to wells of the latter; therefore, when further on we are considering our sewage problem, we must not forget the wells and the possible pollution that may result unless great care be exercised in selecting a suitable site for the disposal of the sewage. Note that the fall of the surface cannot always be taken as indicating the contour of the water-bearing strata.

Having satisfied ourselves upon the purity and quantity of the water supply, our next consideration must be how to store it in a convenient manner for use free from risk of pollution.

It may be stored in a reservoir or underground tank, which must be very carefully formed with sound brickwork upon a concrete bottom, and covered in by doming, arches, or concrete and iron; the bottom should be formed with rounded angles to facilitate cleaning, and the whole of the inside surface rendered and smoothly trowelled in cement.

There should also be clay puddling round the outside and over the top, while the opening for access must stand well above ground to prevent surface-water finding an entry. Frequently the situation will not allow of this form of main storage tank, when it may be necessary to build a water tower and allow the water to supply the cisterns in the house, stables, laundry, etc., by gravitation or otherwise pump direct to the storage cisterns in the buildings, which frequently means very heavy work for the pumps due to long horizontal pipes.

Overflows, which should be as short as possible, must be provided to all tanks and cisterns, and not be connected to drains.

Store cisterns inside the building may be of lead, galvanised iron, or enamelled fireclay, and should always be provided with a movable cover and situated in a clean, accessible position.

Baths.

The bathroom should be large, light, and airy, with cross ventilation, and the walls and floors should be of impervious material, but if of wood it should be covered with lead.

The fittings may include, beside the usual slipper bath, a single or double lavatory basin, a shower and spray bath, either combined with the slipper bath or independent. Other baths are sometimes used, such as a sitz bath, bidet, etc., but the combined slipper and spray meets most requirements.

Perhaps the nearest attempt to an ideal bath is the latest pattern independent copper bath, which is made of strong copper with roll edge and strong supports or feet; the outlet is at the end, where it should be, and not in the centre, as is usual in copper baths, and has large pillar cocks and standing accessible overflow, quick waste, and trap. At the end is a plate glass

screen on three sides, behind which are the various plated pipes for shower, spray, wave, douche, etc. The next best is a first quality white enamelled cast-iron bath, with roll edge, quick, accessible waste and overflow combined, without casing, the outside being decorated in harmony with the room. Glazed fireclay is perhaps the most durable and sanitary material for baths, but, owing to its great thickness, a bath of this material is very heavy, and requires to be warmed with hot water when not in constant use. In public baths, where the demand for baths is constant, this kind is generally fixed. Some baths need enclosures; these should be avoided, as the space within becomes a store for matter in the wrong place.

It is most important that a bath should be fitted with a plentiful supply of hot water, large supply valves discharging above the water line of the bath, and also with a large, quick waste. The noise frequently experienced when the bath is emptying may be checked to a great extent by providing ventilation to the waste pipe, although this retards the velocity of the discharge.

The lavatory basins may each be formed in one piece of pottery, or fixed beneath a marble top supported upon cantilevers, but without enclosures; the necessary pipes may be of plated brass or copper if desired, but, personally, I prefer lead, kept back out of the way of injury.

While speaking of pipes, let me advocate the importance of fixing every pipe upon the surface of the walls, not buried in them, as is so often the case. Chases are sometimes advisable, but, if used, they should be regarded as recesses in the walls and be rendered in cement, or otherwise lined with impervious material to match the wall surfaces and covered with movable casing.

The hot-water service pipes may be carried along one side of the room or to a radiator, in the form of a towel horse, which will be found very convenient.

The linen cupboard might, with advantage, be formed somewhere near at hand, so that the hot-water pipes may, on their way to the bath, be used to keep the linen aired by passing through the cupboard.

Water-closets.

These should not be in the bathroom, nor should access to them be from a bathroom, but from a ventilated lobby common to both. Neither is it advisable to have a lavatory basin in the water-closet.

The walls and floors and ventilation described for bathrooms equally apply here. Carpets ought never to be used, a loose mat being far preferable. The apparatus should be as simple as is consistent with efficiency.

A pedestal closet should be of the wash-down type, not "wash out," in one piece of fireclay, or similar material, strong and neat in appearance, with accessible joints to soil pipe, and no recesses in which dirt may accumulate; the flush pipe from the cistern should discharge vertically into a socket provided at the back, without india-rubber cone, and, with two gallons of water, should thoroughly wash the inside of the pan and replace the whole of the contents of the trap with clean water. The larger the water area, the less liable is the pan to become foul, but beyond a certain point the contents cannot be efficiently removed except by the syphonic action of the syphonic closet. There are various forms of this type of closet, some better than others. Those without air pipes and puff pipes in the cisterns, but having a second trap, are to be preferred; the simpler the apparatus the better.

Various means for discharging flushing cisterns for wash-down closets have been devised. Beside the simple pull, there is the push valve, to release confined air and allow the syphon action to start, or to compress air and thus drive the water over the syphon to start it; there is also the plunger, the lifting valve, lifting drum, etc. The lifting valve to start the syphon is the simplest and generally most certain in action, and is passed by most water companies.

The flushing cistern may be of cast iron, but should be galvanised to prevent rust; lead-lined or cast-lead cisterns are best, when the water does not affect the lead, but are more costly. Porcelain is also a useful and ornamental material. The flush pipe of lead or copper should be as straight as possible, and securely connected to the arm of the pan. India-rubber cones are not desirable for this joint.

Valve closets are not so frequently used as

formerly, owing to their complicated parts and liability to leaks, although they are sometimes preferred for ladies' use. They should be fixed within an enclosure, which is easily accessible, floor lined with lead, and the walls and all inside the enclosure painted white. There should be a large supply valve, accessible overflow, and a puff pipe to the open air from the valve box between the valve and the trap beneath. Slop tops, formed in one piece with the pan, assist in making a draught-proof seat.

Valve closets require a separate supply cistern containing about ten gallons.

Overflow pipes from cisterns and floors should not have flaps on their external end, as is so often advocated; they invariably become set fast, either open or shut, and are then worse than useless. The small flushing cisterns can be cased or otherwise decorated to harmonise with the surroundings, and the pipes to and from them cased or plated.

Urinals.

In a private house "avoid them entirely", at best they are a constant nuisance and need every care and attention, with abundant flushing; even where necessary, as in clubs, factories, schools, etc., they should be as simple as possible, formed in one piece of fireclay, with waste and water-pipes easily accessible. The outlet usually supplied with them is almost useless.

Never fix urinals on upper floors, as, unless careful attention is given to the fixing and the waste from them, they invariably leak and cause trouble below. The weak points are naturally the joints, therefore the fewer the better, the one joint to which particular attention should be given being the one between the urinal and the trap, which should always be formed with a large brass washer, fly-nut, and union, giving a dome grating with bayonet joint.

Housemaid's Sink, etc.

There should always be a small room, with opening window on each bedroom floor, accommodating a slop sink, which should be fitted with flushing cistern, etc., and connected to soil pipe, and also a sink for drawing hot and cold water. The waste from the latter should discharge into an iron (not lead) waste pipe. The combination of these two sinks in one set, so common in makers' catalogues and exhibitions, is often unsuitable for the intended purpose, because the hot and sometimes boiling water produces injurious expansion in the soil pipe with disastrous results.

The space under these sinks should be kept free from enclosures, and every facility given to minimise the difficulty of keeping these places clean. Above all things, linoleum should never be fixed under sinks, one so frequently finds it there with always the same result—moisture and decay.

The main water cistern should never be placed in this room, although, I regret to say, it is not unusual a position to find it.

Kitchen and Scullery Sinks, etc.

This department should have preferably a north aspect, lofty, well-lighted by windows reaching to near the ceiling. The walls and floors should be of impervious material, which may be readily cleaned. The sinks should consist of one or more for washing purposes, and may be of enamelled fireclay, with wire or teak grid; tinned copper or lead-lined wood sinks, each having their respective merits and defects. Fireclay sinks are cleaner than the others, but are easily damaged by saucepans, and are liable to break the crockery unless the grids are used. Copper and white metal sinks are perhaps the best, but are expensive. While lead-lined are very general, they are dirty, and frequently need repair, but are less destructive to crockery. Vegetable sinks should also be provided for washing vegetables, and are best of the deep enamelled fireclay kind, fitted with perforated shield grating and standing overflow and waste combined; being much more easily cleaned than others.

All sinks should be supported upon cantilevers, and the spaces under should not be enclosed, although a guard rail will be necessary to protect the pipes and traps from injury.

Teak sinks are sometimes used for washing-up purposes, but they need constant cleaning to remove grease, etc.

Outlets from sinks should always be formed with large cobweb gratings. The trap below should be connected to the sink by a strong brass union, back-nut, and lead washer, instead of the spigot and socket with stoneware pipe

so frequently met with in the cheaper class of sink.

Larders

should have a northern aspect, with abundant cross ventilation, and be near the kitchen, but not entered direct from it. Wire gauze (preferably of copper) should be fitted to the windows and secured to wood frames on hinges. Some larders are fitted with pickling troughs, with pig and waste; these, of course, must not be connected to a drain, neither should a gully be in the floor. If drainage from the floor is necessary, it should be formed by curbing the floor to an outlet through the wall as short as possible and discharging upon the surface of the paving outside.

Shelves should be of slate, supported upon cantilevers, the walls lined with white glaze bricks or tiles, and the floor of some impervious material. Personally, I prefer a slate table in the centre of the room, leaving the walls free. Larders should not be formed underground.

Pantry and Stillroom.

The butler's and footmen's pantries and the stillroom require sinks, which may be either of enameled fireclay or lead lined; some butlers prefer the former, others the latter. These sinks are usually supplied with draining boards, preferably of beech, and not covered with lead. The space under the sinks is usually enclosed; when this is the case the walls and wooden sides should be painted with white enamel and a lead safe formed on the floor, turned up all round at least 6 in., having a 1-in. waste pipe discharging through wall to the open air. This cupboard is generally used for a pail to receive pig, tea-leaves, etc., and soon becomes in an unsanitary condition if precautions be not taken to ensure cleanliness.

Enclosures under or around any sanitary fitting invariably become nuisances, and it is preferable, except in special instances, to omit them and everything that hinders the regular cleaning of the recesses. All these sinks should have drinking water laid on from the main supply pipe and labelled "Drinking water."

Having considered so far how clean water can be obtained and utilised inside a dwelling, I now propose to indicate how foul liquids can be got rid of.

Soil Pipes.

When considering a soil pipe we must deter-

1. The material of which it is to be made.
2. The size necessary under the conditions.
3. The position in which to fix it.
4. The surroundings such as rain-water pipes, etc., with which it should harmonise; and
5. Method of fixing and jointing the pipe.

Soil pipes are usually made of cast iron or drawn lead—cast iron made in 6-ft. lengths, either coated with Dr. Angus Smith's solution or galvanised; the latter is most suitable when the pipes are to be painted to match the rain-water pipes, because paint will not remain upon Dr. Angus Smith's solution. These pipes are cheaper than lead, less liable to damage, and more easily fixed and jointed, but they are more unsightly, and there is difficulty in obtaining a branch exactly to suit the position, and many branches mean many joints and much cutting of pipe. A cast-iron junction usually means at least three joints, while in lead pipe only one is necessary.

Drawn lead soil pipe is made of thicknesses corresponding with those of sheet lead. The pipe whose thickness is equal to that of 8 lb. sheet lead is the strength most generally used, or for special purposes 10 lb. The inside surface of lead pipe is smooth, and, provided that the size is suitably small for the work, it will remain clean and free from corrosion.

Rarely will it be necessary to exceed 3½ in. internal diameter for any soil pipe, especially in country houses. Lofty buildings in towns may require 4 in., while larger sizes are occasionally met with. I might mention that these larger pipes are almost invariably furred to a considerable thickness on the inside after being in use a long time, thereby reducing their internal diameter.

I know of one case where the working diameter of a 4-in. pipe was thus reduced to 2½ in. A ventilating pipe is quite a different matter; 4 in. to 6 in. diameter may be often more suitable than 3 in.

If it be necessary to fix the soil pipe within a building, it should be of 8 lb. drawn lead at least, but must not be buried in the wall, and, if in a chase, the walls should be treated as previously described for water pipes and the rising in short lengths should be secured with

brass cups and screws to framed grounds fixed to the walls. The most suitable place to fix a soil pipe is *outside* the building, in which case it should be arranged in such a manner as to be as unobtrusive as possible. The method usually adopted of fixing soil pipes in 10-ft. lengths with three pairs of double cast-lead tacks is certainly efficient, but at the same time it is not elegant. Sometimes astragal joints or socket joints are used instead of the usual wiped joint, with disastrous results, there being insufficient solder to form a lasting connexion, more especially if it be fixed with sheet lead tacks fixed 6 ft. apart. How can this be remedied?

One way I have found very successful is to have strong pipe in, say, 6-ft. lengths, to agree with the rain-water pipes, which may also be of lead, and fixed to walls with extra strong lead strips wiped on to the pipe at the joint and covered with ordinary sheet lead ears, the joints being "wiped" in the usual way, with a small astragal attached to the pipe above and below the joint. By this means the pipe is securely jointed and fixed, and, except to the initiated, is similar in appearance to the rain-water pipes. We are told that an "anti-siphonage pipe" is necessary to preserve the seal of the closet trap. Quite so; but in the majority of country houses anti-siphonage pipes are not necessary, there being only two principal floors as a rule. Perhaps in one or two instances it might be necessary, but need not occur upon the principal elevations in a carefully-planned building.

Soil pipes now invariably discharge direct into the drain, and the upper part is continued to above the roof of the same to greater diameter, with a simple open end protected by a stout copper-wire balloon. Cords have been proved by experiment and practice to have few, if any, advantages over open ends, as these pipes frequently act as inlets as well as outlets, the less obstruction there is to check the current of air in either direction the better.

Boiling water must be carefully excluded from lead soil pipes, otherwise the undue expansion will split or tear apart the lead at the junctions between the branches and the main pipe.

Waste Pipes

from baths, lavatories, sinks, etc., not being slop sinks, should always discharge into gullies in the open air *beneath* the grating, but *above* the water. This is a very important point, as many by-laws require them to discharge into a channel 2 ft. from the gully. A more objectionable arrangement it is difficult to imagine, and I hope before long to see the provincial authorities follow the example of the L.C.C. and eliminate this undesirable by-law.

These waste pipes must be, if more than a few feet in length, of some material which is not easily damaged by hot water. Wrought iron with screwed joint or cast iron with caulked joints are most generally in use, although the short lengths referred to previously and short branches may be, and in fact are, preferably of lead. The expansion of iron pipe, if connected directly to a lavatory basin, etc., is very likely to damage the fitting.

Lead pipes have, I might almost say, an ideal internal surface for conducting water and sewage from point to point, offering the minimum of resistance. They are, however, injuriously affected by various means—for instance, damage by violence, such as knocks, nails, screws, etc., when behind panelling or casings; chemical action when buried in walls producing decomposition; "creeping," buckling, and, finally, cracking or tearing when subject to great variation of temperature. The facility of bending lead pipes of small diameter is so great that its use is often preferred for this quality alone, which enables the pipe to be fitted with greater ease to the angles and curves.

Wrought-iron pipes are expensive and more liable to rust than cast-iron, which is cheaper and stronger and allows a little play at the joints. The joints will probably in course of time need recaulking if the stack is very long and has very hot water frequently passing through it.

There is another type of pipe which is referred to in one of the latest books upon this subject as the best for all purposes—viz., cast-iron pipe lined with lead—what better would be desired—a strong exterior, with a smooth interior, of lengths corresponding with rain-water pipes, and the joints more easily made and fixed than in the case of lead pipes. Let us for a

moment consider the condition of this ideal pipe after it has been in use as a waste pipe for a short period. Hot water has been frequently passing, and the lead lining has, in the same way as lead pipe, been expanding more than the iron outside, and consequently the two materials have become separated; the hot water still continues to flow intermittently through the pipe, the lead "creeps," and cannot bulge outwards because of the iron coating, therefore it is forced inwards, with the result that the pipe is practically choked. I will leave you to form your own opinion upon this ideal pipe.

Waste pipes generally may be considered similar to soil pipes as regards fixing, etc., but they must, as I said before, discharge into a gully near the foot, which in certain positions should have an air-tight cover and be ventilated at a convenient position away from windows, etc. The upper part should be carried above eaves and windows, and the traps of each fitting should be protected by a puff pipe, which is brought under the top of the fitting to the face of wall outside. This puff pipe does double duty—besides protecting the trap under the fitting, it acts as an overflow in case the vertical pipe is temporarily blocked, and thus saves a flood in the room below if a bath, for example, be discharged on an upper floor.

I always prefer waste pipes with junctions instead of the various branches discharging into heads at each floor. The heads offer a large exposed surface for the accumulation of filth.

The traps should be of strong anti-D cast-lead type, with screw cap for cleaning and a short length of lead connected to the iron pipe with brass tailpiece and caulked joint outside.

Traps from lavatory basins should be 1½ in. diameter, while those from the bath and sinks, except scullery sink, should be 2 in. diameter, and the scullery sink 3½ in. to 2 in.—that is, 3½ in. at inlet, to receive a large cobweb grating.

Drains, Gullies, Chambers, etc.

The term "drains" is generally understood to refer to the pipes underground conveying the sewage from the soil pipes and gullies to the sewer, cesspool, or filter bed.

These are formed of two different materials—heavy cast iron, protected by a coating of Dr. Angus Smith's solution, and glazed stoneware. The choice of these two is generally determined by the nature of the ground and surroundings and the relative positions of the house and drain. On a bad foundation, when passing under a building, or if the drains be near the surface, iron pipes, possessing greater strength and having fewer joints, are less liable to damage, but the inside is not so smooth, nor does it resist acids to the same extent that glazed stoneware does. A well-laid stoneware drain, with clear bore bedded upon and protected by good cement concrete with carefully-made cement joints, is much more self-cleansing than an iron drain. The cost of drainage is practically the same whichever kind of pipe is used, less concrete being required for the iron pipes.

Fall or inclination is an important factor in considering drains—I in 30 (or 4 in. in 10 ft.) is most suitable for a 4-in. drain, and 1 in 40 (or 3 in. in 10 ft.), best for a 6-in. drain. We are not always able to obtain these falls, but they should be adhered to as closely as possible. Excess of fall is quite as unsatisfactory as too little.

Gullies.—All gullies should be bedded in cement concrete, fixed as near the surface of the ground as possible, and covered with a 3½-in. dished York stone to receive grating. When it is necessary to keep the gully low down, a chamber 12-in. square, inside dimension, should be formed of 9-in. brickwork in cement, smoothly rendered and brought up to receive the dished cover stone at surface of ground. It is essential that these extensions, and, in fact, the whole system, should be watertight. Deep chambers over gullies are not desirable.

Circular gullies (and square ones, by the use of an adapter) are sometimes brought to the surface with 9-in. diameter stoneware pipes, in which case the pipes should be surrounded with concrete. It is advisable to have all iron-work, except iron drain pipes, etc., galvanised, to protect it from rust. It is sometimes held that the galvanising soon perishes; I must say I have not experienced any inconvenience in this respect, while constant trouble exists where iron is not galvanised.

A flush tank, when connected to the scullery gully, is very useful for breaking up and driving

the grease through long drains. Sometimes the bath waste is arranged to effect this object. Sand used for cleaning copper utensils is a great trouble in drains, for when mixed with the grease it becomes very hard and solid. The only remedy is prompt and frequent removal of grease, etc., and by flushing with pails of hot soda-water or sweeping the drains, in addition to the flushing just mentioned. The gullies should be of the self-cleaning, deep-seal type, with 10-in. grating. Those used for surface drainage only should be of a deep pattern, to retain the grit, etc. When a waste pipe discharges some little distance from a gully it is often advisable to fix an access shoe at the foot and carry the drain to inlet of gully underground. This stoneware shoe should have a cover stone similar to those used for gullies, and galvanised iron plate let in instead of the grating, to keep out leaves, stones, etc. So-called grease traps are ineffective, as well as very offensive and dangerous contrivances.

Chambers—or manholes, as they are frequently called—should be placed at intervals in the drainage system, at bends, junctions, and at points of disconnection, also in straight runs of considerable length, at least over 60 ft., to facilitate sweeping, etc. The chambers should be formed upon a 6-in. bed of concrete, with 9-in. brick walls, smoothly rendered inside to underside of cover, the bottoms formed of white glazed channel with three-quarter channel branches, and brick on edge placed vertically along the main channel and benched up 6 in. vertically and back to wall at an angle of 30 degrees, to offer as little facility for lodgment in event of a temporary stoppage and also to give a secure foothold, which a steeper angle does not afford.

The portion not enclosed by the iron cover should have 3-in. York stone firmly bedded in cement. The size of these chambers depends upon their depth. A shallow chamber—that is, up to 2 ft. 6 in. deep—should be as nearly the size of the iron cover as is consistent with the number of branches it receives, while deeper ones should be about 2 ft. 6 in. wide and at least 3 ft. long, to give a man room to work in them. It is obviously unnecessary to form chambers larger than required for the work they have to do, because in case of a stoppage they take a longer time to fill, and make their condition apparent.

You will notice I have not advocated iron chambers even when iron drains are used. I think it will be a long time before we are able to find anything better than the chamber of rendered brickwork and white-glazed stoneware channels. Iron chambers are simply inspection bends or junctions; it is difficult to make the covers watertight, and they are not easy to open, especially when the object is to remove an obstruction. They are sometimes useful inside a building at the top end of a branch where the drain is shallow. These iron chambers still require the brick chamber, which should be rendered, and iron cover for access, so that there is no advantage in using them.

Chamber covers are of various types, those with a condensation seal being undoubtedly the best, especially when inside a building. There are also covers formed to receive tiles, wood blocks, and turf on gravel, which are less conspicuous than the chequered iron tops, only a rim of iron being visible. If necessary, any cover can be fixed just below paving level, the stone slabs bedded in sand effectively obscuring it from view.

Locking covers, except in certain exposed positions, are not necessary. Let each cover have eyelets for hooks, instead of hand holes, and be strong and heavy; they will then be too difficult for mischievous persons to open. Locks and bolts only become corroded, rusty, or broken, and are then useless, and cause considerable waste of time when examining or testing. Hinged covers are always a trouble, and are going out of use.

Ventilation of the system must not be forgotten. Soil pipes usually provide the necessary outlets, but they are not sufficient alone in all cases. The idea that two or more pipes taken from different branches to above the roof will secure efficient ventilation is erroneous. I will give you an example of this. A chamber was formed with five distinct branches, each with a V.P. taken above the roof. Surely this was sufficient ventilation. Yet, upon raising the cover after the drains had been used a few months, the air in the chamber was found most offensive. After consideration, I decided to form an inlet at ground level some little distance away, with the result that the chamber is now as wholesome as could be desired. At the same

time, I do not like the inlet in the front area just outside the kitchen window, as is so frequently the case in towns; but in country houses there should be no difficulty in keeping the inlet at a reasonable distance from the buildings. I call these "inlets," but, at certain times, they undoubtedly act as "outlets."

Rain-water Drains.

When the rain-water drain is treated separately from the soil drainage there should not be gullies at the feet of rain-water pipes, but, instead, stoneware or iron access shoes with cover stone and plate, to prevent surface-water or other undesirable matter finding its way to the rain-water storage tanks. Otherwise the drains should be constructed similar to soil drains. They are usually 6 in. diameter with 4-in. branches to a single down pipe.

Rain-water Storage, etc.

Rain-water, especially when gathered in the country, is fairly clean, and, if filtered and stored in suitable receptacles, is a great acquisition, more particularly for washing purposes. It is best, whenever possible, to collect and store the rain-water as near the roof as practicable, thus saving expensive pumping machines and underground drains and tanks. Needless to say, a large overflow is essential to prevent flooding in time of heavy storms. Cisterns for storing rain-water above ground should be of galvanised wrought iron or lead lined, with covers in sections made to lift off. These cisterns should be placed in easily accessible and well-lighted positions.

When stored underground, the tank or reservoir should be similar to that previously described when considering water supply and storage, with the addition of a filtering chamber.

Purifying Rain-water.

There are two means generally adopted for removing many of the impurities, such as soot and roof washings, from rain-water. The separator, which allows the first portion of the water to run to waste and then, by a rocking motion, passes the remainder to the storage tanks is effective, but, of course, there is waste of water, which in a dry season is a consideration; while a filter composed of broken bricks, ballast, and sand is most useful, but needs occasional cleaning. Some favour a small settling chamber, divided from the filter by a brick wall built with half a dozen courses, dry at the bottom, giving upward filtration, thus avoiding to a great extent choking of the upper surface of the filter, as in the case of downward filtration. All the tanks must have an overflow, but this should not be connected to the soil drains. Some years ago, at a building which I now visit periodically, an underground rain-water tank had its overflow connected to the soil drains; during a temporary stoppage in the latter, sewage entered the tank through the overflow and was pumped up to the laundry. The overflow was diverted to a suitable position without any difficulty, and such a disaster cannot occur again.

For obvious reasons, surface-water gullies and gullies at the foot of rain-water pipes should never be connected to these tanks; yet I have seen soap-suds floating on the surface of the water in the rain-water tanks, probably due to foul water from a lavatory being discharged into a gully at the foot of a rain-water pipe.

Land Drains.

When the subsoil of the site is surcharged with water, it is advisable to conduct it away from the building as much as possible; this is accomplished by means of agricultural drain pipes laid with open joints a short distance apart in trenches, with ballast or brushwood to within a foot or so of the surface and covered with ordinary garden soil or mould. If there be a flow to underground, water and we are able by land drains to divert it from the site of the building, nothing more need trouble us except to see that the drains do not in course of time become blocked with roots, etc. The water is not always so easily disposed of. At best we may only be able to lower the level of the water, in which case we must maintain a free exit for the surplus and remove it as quickly as it accumulates, either by pumping or by discharging into a stream, ditch, or drain; in the last case it will be necessary to take precautions to prevent a back flow in case of flood or temporary stoppage of the drain.

A hinged flap is most frequently used, which closes upon a prepared seating and is fixed to

the end of the discharge pipe; or a trap or gully in which a copper or rubber floating ball is placed, which, when water backs up into the outlet, effectively closes the inlet, thereby preventing the flood water finding its way into the land drains.

It is convenient to form chambers of brick work in cement at intervals upon the land drains, to give access and ready means of inspection to see that they are working satisfactorily.

Rain-water or subsoil-water should be excluded from soil drains if the sewage is to be treated either by chemical or bacterial processes, otherwise unnecessary expense will be incurred by the increased volume to be dealt with.

Stables.

The floors of stables should be of hard, impervious material, with as few joints as possible, and curreted to fall to a channel just outside the stall divisions, which discharges either through the wall into a gully or into an open end in the channel and thence to a gully outside. This open end is a small pit formed with a white glazed channel bottom and cement sides, and is made large enough to receive a galvanised cast-iron perforated bucket to catch straw, etc., and covered with a heavy hinged cast-iron grating. It is often desirable, however, to provide a shallow channel with a cast-iron cover, let in flush with the paving, and with similar branches to the centre of most of the stalls, to prevent the straw becoming wet. Loose boxes usually have the open end before described in the centre continued to the gully outside.

Every channel and drain in a stable must be easily accessible for cleansing and sweeping, and there should be no gullies inside the buildings.

The manure pit should have hard, impervious walls and floor, the latter curreted to an outlet pipe discharging through the wall into a gully. These gullies should be self-cleaning, but must contain a galvanised perforated bucket to catch straw, etc.

Besides stalls and loose boxes for carriage horses, hunters, and cart horses, there is usually a sick box. This should be quite apart from the others and have a separate drain from it.

The washing space should have a deep yard gully to retain the grit from washings, etc.

If there be a shoeing forge, as is sometimes the case, do not forget to provide a drain from where the horses stand.

Drains from stables, cowyards, piggeries, etc., should always discharge into a liquid manure tank carefully built in brickwork in cement and rendered watertight, having a rounded bottom to facilitate removal of sediment. There should be a pipe from ground level to about 1 ft. 6 in. from the bottom, into which can be dropped the suction pipe of a pump attached to a manure cart. The liquid manure can then be carted to the fields or gardens where required. These underground storage tanks should also be provided with an access hole in their crown and an overflow to carry off an excess which may accumulate in time of storm from surface-water gullies, etc., and may be connected to the main drain from the house to the filter beds, etc.

An ample supply of water is important for the stables, but it should be distinct from the house supply.

A cistern in the loft or clock tower, to which the men can pump water, is a great convenience, and a hose can then be used for washing horses and carriages.

One or two sinks are necessary in the harness-room, or in a small room adjoining, with hot and cold water laid on to them.

If a suitable grate with a boiler be fitted in the harness or mess room, an ample supply of hot water can be provided for these sinks, which will be found very useful for various purposes.

While speaking of hot water, I might remind you that the coach-house should be kept draught at an even temperature. This is best arranged by providing small hot-water apparatus with pipes from it to the coach-house, and, if possible, continued round the men's rooms.

Sometimes a loose box is fitted up as a Turkish bath for the horses. This can be heated by the same apparatus.

Cowhouses.

Each division in a cowhouse accommodates two cows, and a wide trough is formed just outside the heel post. This channel and the dunging passage should be formed of an impervious material with grooves to prevent the cows

slipping, and in the centre of each division should be an open end similar to those in the stables, and conducted to a gully outside. The space where the cows stand should be level, and formed of well-rammed chalk or clay. Calving boxes are treated like loose boxes, with an open end in centre discharging into a gully outside. (Chickens usually have an open channel discharging over a gully. Pigsties should discharge through a pipe into a wide channel outside the sties, and be conducted to a gully with basket before entering the drain.

Dairies

should be in a cool, sheltered position within easy distance of the cowsheds and well ventilated. Near at hand should be the dairy scullery with sink, hot and cold water laid on, and paved floor connected to a pipe through the wall discharging on to a gully, not inside the building, as is frequently the case.

Disposal of Sewage.

The sewage when it arrives from the house and buildings may be treated in various ways, but time will not permit of a description of them all; they would provide more than sufficient material for a whole evening's discussion. One very simple and effective method which has proved quite satisfactory in dealing with this class of sewage may, however, be briefly described.

The sewage from a large country house with stabling for forty horses and accommodation for twenty cows, after leaving the disconnecting chamber, is first retained in a large watertight settling tank, covered over similar to the old-fashioned cesspool, except that the inlet and overflow are turned down, thereby, among other reasons, preventing the scum finding its way into the drains. This tank is capable of holding at least one day's flow of sewage. The overflow is discharged upon the surface of a long, open filter situated in a meadow, and composed of broken bricks, clinker, etc., finished with smaller local material on top. The sewage is distributed over the surface of the filter by channels or a sprayer and allowed to percolate through 4 ft. to 5 ft. of material, when it reaches a layer of land drain pipes at the bottom, which conduct the effluent to the end of the filter and thence to the land or ditch. The effluent is colourless and odourless.

The water in the ditch which receives it was foul and a nuisance before the introduction of this form of filter, but when I last saw it, after the filter had been in use about three years, it was quite sweet and wholesome.

The Chairman said he had an important committee meeting to attend elsewhere, and he would ask their Vice-President, Mr. J. S. Gibson, to take the chair for the remainder of the evening.

Mr. Arnold Mitchell, in proposing a vote of thanks to Mr. Osborne Smith for his practical paper, which was full of hints of all kinds which would help them in their work. It was the kind of paper they wished to have, and which they valued, but it dealt with things in a luxurious sort of way. Mr. Smith was a fortunate man. He had been giving hints on the planning and arranging of the buildings which they hoped to build, but he (the speaker) was afraid that very few of them would ever have the chance of building a Turkish bath for horses. Architects built stables, but Turkish baths for horses, while they might have them to erect, were not likely to come their way. Mr. Smith had in some measure been talking above their heads; he had been giving wrinkles about building which few of them would get to build; still, the information might be stored in one's mind for future use. The general tone of the paper allowed a luxury in the fittings and appointments of a house which, as a rule, the client would not allow the architect to indulge in. As to Mr. Smith's remarks that architects should endeavour to conceal the external drain-pipes, of course they should, but could they do it as a rule? Local authorities rightly compelled them to put soil and waste pipes outside the house. In a country house they did not expect to have courts and areas in which they could put their drainage arrangements as they could in London houses, and so leave the house fronts free. These pipes could not, as a rule, be kept away from the front. He was building a house in which there were many bathrooms adjoining the principal bedrooms, and adjoining these bathrooms there had to be closets. How could he avoid showing the pipes in such circumstances? It was Utopian

to think of anything else; he would conceal them if he could, but it was not possible. Then, as to cross-ventilation being necessary or desirable, theoretically it was, but, again, in practice it was not possible. In a hospital they should get cross-ventilated lobbies, but in a house in the country it was not practical to get cross-ventilation to water-closets and to bathrooms. Mr. Smith suggested that the ideal bath was a copper one. That was so—if they could get it. Again, it was all a matter of expense. Copper baths were awkward things to handle. He had never found an independent copper bath such as Mr. Smith referred to which had a satisfactory rolled-over edge, but probably they were to be found. The value of a copper bath was its thinness—being thin, it took very little heat out of the water, and was an economical bath as far as the water was concerned, but, unless the material were thick, it did not resist wear and tear. Where a copper bath was used, a wooden casing was necessary, for a copper bath would not stand knocking about. As to the hot-water pipe to the bathroom, an economical way of using it was to run it round one or two sides of the room and bring it out about 4 in. from the wall on little brackets. That cost very little; it gave a certain amount of warmth to the bathroom, and provided the feature Mr. Smith spoke of as being achieved by the radiator—i.e., it provided a towel-rail, but one on which the towels of all the family could be put. Water-closet pans were extremely difficult to keep clean with the two-gallon flush. He supposed that a large number of architects would agree that they had never found a pedestal closet that would keep properly clean with only a two-gallon flush. Most of the water companies would not allow more than a two-gallon flush, and he found that the way to keep it clean was to have it attended to every day by the housemaid. With a proper three-gallon flush this daily cleansing would probably be unnecessary, but with the ordinary pedestal flush-out closet and the two-gallon flush it must be cleaned as well. Therefore he thought valve closets were preferable, and there was no doubt that they were greatly preferred by most people, though the enclosure in front was objectionable. It was by far the most satisfactory closet to put into a country house, and the big water area and the comfortable seat were appreciated. If flushing cisterns were required they had best be of porcelain, such cisterns cost but little more than iron and were far sweeter. As to the kitchen floor, Mr. Smith said it should be impervious. Yes, theoretically; but what would the cook say? If the cook had to stand on a hard cement floor, or on any other hard substance, she would have something to say to her mistress on the subject. A wood-block floor was preferred by a cook, and though it was not impervious it enabled one to keep their cooking a good deal longer. Standing on a wood block floor was not so tiring as standing on a hard cement floor. As to the support of sinks, he found that a good practice was to build them on little glazed brick piers but not enclosed. In regard to the material of scullery sinks, he thought porcelain was the best; there were more breakages, but makers were minimising that risk by the use of double wooden strips, which were screwed along the front edge, and when those strips wore out fresh ones could be put on. He thought that these wooden strips solved the difficulty to a great extent. Cleanliness counts for more than breakage, and more cleanliness was obtained from porcelain than from lead or copper. Mr. Smith spoke about 8-lb. and 10-lb. soil pipes. He (the speaker) had never used more than 7-lb. He could not afford more than 7-lb. pipes, but he would not put sockets 6 ft. apart; he put them 5 ft. apart. He found that 5 ft. spacing was about the limit for rain-water pipes, and also for soil pipes where both were of lead. As to country houses having iron drains, while iron drains were put in London buildings where they run under the floors, it was a new experience to him to put iron drains in country houses. He should have thought the cost was considerably more than in the case of earthenware pipes, and he thought iron pipes were unnecessary. According to the by-laws of many local authorities cement had to be put under the drains, and the requirements would not be abated if iron pipes were put in. The requirements stated that the drains must be on a bed of concrete, and if iron drains were used the authorities would not let less cement be used, they would have concrete right along the drain,

and so cost would not be saved. [Mr. Smith: The authorities, I believe, ask for concrete at each joint of a pipe outside a building.] As to the fall of a drain, what Mr. Smith said was news to him; he had always allowed the usual fall of 2 in. in 10 ft. A deeper fall added to the cost of the excavation. He tried to keep pipes as small as possible, and in country houses he doubted if they need be more than 4 in., though he saw that Mr. Smith said 6 in.

Mr. S. Flint Clarkson said that, to his personal knowledge, Mr. Smith had not merely a tepid regard for gulleys, quick wastes and wiped joints, but an ardent love of them. His paper might have been more aptly entitled, "Notes as to the Sanitation of Country Houses and Accessory Buildings," but apparently both the larger title and the limited scope of the paper were suggested when Mr. Smith was invited to prepare it; perhaps he would deal at large at a future time with the branches of the subject indicated, but not treated in detail. Mr. Clarkson then made suggestions as to the provision of sanitary blocks in large houses, reached by cross-ventilated (but warmed) lobbies, containing cistern chambers at top, and water-closets, some bathrooms, lavatories, etc., below. If in a generally accepted position, say on the north side of the building, and near the principal staircase, they would be readily found when looked for, and awkward windows, suggestive pipes and ventilators on the garden fronts of pleasant buildings would be avoided. In a well-arranged water-closet the seat should not be under the window, but against a piece of unoccupied wall, draughts and trouble in water supply being thus avoided, and the soil pipes, if there was a cross-ventilated lobby, that is, a lobby with open spaces on each side of it, could be in accessible (but not prominent) positions on the outside of the walls. Mr. Clarkson then touched briefly on some of the details referred to by Mr. Smith. 1. For hot-water supply have a cylinder adjoining the kitchen range with short (but large) flow and return pipes and a stand pipe, serving as supply to fittings, carried up from the crown of the cylinder. 2. For pantry and still-room sinks use framed sinks of teak. They are easily kept clean, are not injured by hot, or any, water, and no metal linings are necessary to make them water-tight; a very ordinary washtub is watertight. 3. Cregeen's trays, Duckett's channels, Albion slippers, and other contrivances have useful ends. It is well to keep waste pipes from fittings well away from waterless traps of gulleys when the traps of fittings are also dry. Such appliances must, of course, be kept clean, but no appliances (water-closets, sinks, gulleys, traps or trays) should be allowed to simply take care of themselves for any length of time. 4. Mr. Clarkson noticed the use of varied spelling and various plurals for gully, and suggested the uniform use by architects of "gully" and "gulleys." Wandering words should be fixed without undue delay, and with deliberate determination. 5. As to inspection pits—a term to be always used, "manhole" being dropped as conveying awkward impressions—there should not be undue anxiety to reduce their lengths. Easy bends should not be made awkward by little shortenings of the pits; the use of a valve to open a special outlet from the ground level when the ordinary outlet was choked was advocated. 6. Underground tanks for rainwater should generally be preferred to cisterns inside buildings, which make architects the slaves of their roofs. Especially in a building of good extent freedom from such petty cares was worth a good deal, and was not worthless in other cases. An underground tank was cool, and could be easily supplied and readily cleaned. The overflow, if no filtering chamber was provided, should be from a sump at the bottom of the tank, a pipe being carried under the bottom and up the side to the level of the top of the dome. This pipe should lead the overflowing water into rubble drains in touch with a fair area of permeable sub-soil; connexions with foul drains being wholly avoided. 7. Flues in walls, lined, it may be, with pipes grouted all round, and otherwise carefully arranged might frequently be substituted with advantage for pipes as air inlets and outlets from drainage. A great show of recognisable sanitary pipes on the exterior of a comely building seems barbarous. A strong effort should be made to obtain public approval of unostentatious flues well arranged and suitably terminated. 8. Mr. Smith had spoken evil of flap caps to overflow

pipes, but they might surely be improved, not given up; make them well, and keep them well tested and cleaned. Mr. Clarkson stated that a too gargantuan appetite was not pretty to see, so he would stop abruptly at this point. Mr. Smith, a young and capable architect, was to be congratulated on his past and his future. He had composed a paper which gave the results of much patient study and much experience of good practical work.

The Chairman, in putting the vote of thanks to the meeting, said he was glad to hear that the drains of a country house did not govern the design, and that it was still possible to make the design govern the laying of the drains. He had had to deal with experts of various kinds, and had almost got to feel that there was little latitude left an architect in regard to architectural design when it was a question of drainage. The paper was full of hard facts, and would open their eyes to the relative value of the fittings of a building, and would no doubt widen their experience of these things. Architects, in the hurry of their work, had hardly time to look round and keep pace with the numberless new developments in all branches of the building trade, which went to make a complex modern building, and they were indebted to Mr. Smith for bringing so much useful information together. He was old enough to remember the great battle of big v. small soil pipes—when Mr. Norman Shaw startled the sanitary world by advocating 2½-in. diameter soil pipes and 3-in. diameter drains. He had not the slightest doubt that, as far as the general practice of sanitary science went, Mr. Shaw was right, and Mr. Shaw was the first, he believed, to carry into practice the use of the small soil pipe and the small drain, and small pipes had since proved to be much more efficient servants than large ones. He remembered having to retrain a comparatively small country house, of about ten or twelve bedrooms and stabling for three or four horses, a few years ago, and he was astonished to find that the main drain pipe was 9 in. in diameter—big enough to drain a village. He thought they might accept the hints given in the paper, and carry them out as far as they were consistent with a client's views; for, after all, an architect might have his own idea of what was best and most advantageous, but a client rightly had a good deal to say on the subject. There were many ideas in the paper which were new to him, because he did not have much to do with erecting country houses. He would like to get country work in the summer time, but at this season he preferred the London drawing office to the country. What had been said by Mr. Smith as to sanitary fittings for country houses applied to all types of houses. As to bathrooms, he wondered whether it was most desirable to get the bath up close against the wall or against two walls and in a corner. As a rule, the bathroom was so small that it could not be got in the middle of the floor, as was done in hospitals, although he knew a man who sacrificed a good deal of room in order to get a bathroom in which he could do this. The objection to placing baths in the corner was the dirt which got under and around the bath, and he had been trying to get an ordinary iron bath, without any feet, made so that the bottom will stand in the ordinary way but set in a cradle, with the casing carried right down to the floor and prevent dirt getting below. As to water-closet fittings, the use of siphonic fittings was becoming greater every day. People found that the noise and inefficiency of the ordinary closet were, except in the case of very cheap work, against its use, and the various types of siphonic closet were proving a good deal more satisfactory. For flats, and where families lived, he thought they were essential. As to manholes and small extensions to gullies, he thought cement was one of the worst materials to use in the way Mr. Smith mentioned. It was not impervious to moisture; on the contrary, it was exceedingly porous. He thought manholes and extensions to gullies could be built at comparatively small increased cost by second quality white glazed bricks or ordinary brown glazed bricks. He had always done that, even in cheap buildings, and the cleanliness and efficiency were well worth the cost. As to what Mr. Smith said about supplies of water to stables in a country house being kept distinct from the house supplies, he did not think Mr. Smith could mean one supply for the house and another, quite distinct, for the stables. No doubt Mr. Smith meant that there should be a disconnection between the two—just as, in

practice, he never connected stable and house drains together; they were distinct in the way that no sewer gas could travel from one to the other. As to Mr. Clarkson's remarks about providing for outlet and inlet ventilation of drains by means of flues in the walls, the suggestion was an admirable one if it could be carried out, but he, for one, had never been able to do it except to a very limited extent. There was no reason why these things should not be treated architecturally, except that it was exceedingly difficult to do so. The inlet to drains to buildings he had often built in the walls with an ordinary outlet flap—that was, inlets which came to within a foot or two above the level of the ground and up to 5 ft. or 6 ft. above the level. But when they dealt with height in piping he could not see how it was possible to do that except at great expense.

The vote of thanks having been heartily agreed to,

In replying, Mr. Osborne Smith said that many points had been raised, that replies would mainly consist of repeating what had already been stated in the paper. He desired to point out to Mr. Mitchell that the paper was dealing with country houses, and not small suburban residences; in the latter, 7-lb. soil pipes and 9-in. walls might be considered sufficient for a certain class of client. The various suggestions made in the paper were compiled from long and varied every-day experience, and should not be "above the head" of any architect who knew anything of this important subject. A few points might be emphasised; as, for instance, ventilated loobies were not necessarily cross ventilated, as was supposed by Mr. Mitchell; independent copper-baths with roll edge were much in demand now; pottery cisterns were about 17 per cent. more than cast iron; piers under scullery sinks were filthy and insanitary; lead soil pipes were usually fixed every 3 ft.; 4-in. soil drains from the house were ample, 6-in. for storm water; channels from waste pipes to gulleys are always foul; flues in brick walls to serve as ventilating pipes would be very unsatisfactory for the health of the inmates; finely-trowelled cement was far superior to glazed bricks for chambers and gully tops, because of the numerous joints in the latter; the supply of water could be common for house and stables, but the store cisterns should be separate and distinct. He also went on to say that he was an architect speaking to architects and students, not a sanitary expert, except in so far as all architects should be sanitary experts if they were to design healthy dwellings.

The Chairman announced that the next meeting will be held on March 10, when Mr. H. V. Lanchester will read a paper on "Law Courts."

The meeting then terminated.

BRITISH SCHOOL AT ROME.

The second open meeting of the British School at Rome for the present season was held on February 21, and was well attended by Italian and foreign archaeologists and by members of the British colony in Rome. The Director, Mr. H. Stuart Jones, read a paper on the circular reliefs which, among other sculptures of earlier date, were employed for the embellishment of the Arch of Constantine. They fall, according to the original arrangement, which has not been adhered to, into four pairs, one relief representing an emperor hunting (or, in one case, starting for the chase) and the other a sacrificial scene at the shrine of a deity, who differs in each case. Professor Petersen, following the opinion which has been current since the middle of the XVIIIth century, considers that the reliefs in their original state belong to the time of Trajan, and, as he stated at the conclusion of the paper, is not prepared as yet to modify his views. Mr. Stuart Jones maintains that upon the south side, where alone the original features of the imperial figure are preserved, in no case can it be proved that Trajan is represented, and that, though the heads are very much damaged, the characteristics which can be recognised in the best preserved of them are rather those of a Flavian emperor. Upon the north side the case is different. Here all the heads have been altered in antiquity; but whereas in the two hunting scenes we have a head of Constantine, the original head having been roughly broken off and the new head fitted with surprising care to the fracture, we find that in the two scenes of sacrifice the emperor is not the same, but is probably to be identified with Claudius Gothicus.

It is known that immediately after the death of Maximianus Constantine proclaimed himself the grandson of the deified Claudius Gothicus, while from the style of the heads it is impossible that any emperor before the time of Alexander Severus can be represented. It is to be noted that these heads are the original ones carefully worked over, one of them having been accidentally broken off and replaced. The same working over is to be seen in one of a pair of reliefs in the Villa Medici, where a representative of the same emperor has been introduced. They represent a procession before the temple of the Magna Mater and of Mars Ultor respectively, and, Mr. Stuart Jones thinks, belong to the Flavian period (the theory that they belonged to the Ara Pacis Augustae has had to be abandoned, as since the discovery of new fragments in the recent excavations there is no room left for them). Inasmuch as Claudius Gothicus was proclaimed emperor in the first of the two temples, and is known to have restored the mausoleum of the Flavian gens, while we have no other record of any building activity on his part, it is not improbable that the reliefs originally formed a part of this edifice. The significance of the arrangement of the reliefs on the arch consists in this—that on the south side we have the unquestioned reliefs representing the original Flavian, while on the north we see the new Flavian dynasty (for Constantine himself was a Flavian) all marked by the nimbus. Mr. A. J. B. Wace, student of the School, followed with a paper upon certain as yet unnoticed reliefs in the Vatican and the Lateran, which, according to the results of his investigations, fill the gap which exists in our knowledge of the development of Roman reliefs between the date of the Arch of Titus (81 A.D.) and that of Trajan at Beneventum (115 A.D.). The first of these is a relief which presents an almost exact duplicate of part of the relief of the Arch of Titus representing the procession bearing the table of the shewbread, and may belong to the Arch of Vespasian and Titus erected at the entrance of the Circus Maximus. Next comes a group of fragments of a slightly later style, which seem to come not from a procession but from a group, showing an important transition of style, the completion of which is seen on the arch at Beneventum. The third represents a portion of a triumphal procession, which probably comes from some unknown arch of Domitian.

TRADE CATALOGUES.

THE Lawrence Water Softener and Steriliser Company send us a descriptive catalogue relative to their process of softening and purifying water. The underlying principle is well known, and is applied in the Lawrence apparatus by boiling the water, so as to liberate carbonic acid gas from the unstable bicarbonates of calcium and magnesium and to deposit the insoluble carbonates left. Boiling is effected continuously, the entering water passing through pipes which abstract heat from water leaving the apparatus. Thus the water passing through the apparatus is gradually heated up to the boiling point and afterwards cooled, so that it is finally discharged very little warmer than when it entered. For the treatment of permanent hardness, caused by the presence of sulphates of calcium or magnesium, it is necessary to employ carbonate of sodium as a reagent for the deposition of the calcium in the form of carbonate. The Lawrence apparatus is made in all sizes, from those suitable for domestic use, in which heat is supplied by a Bunsen burner or any convenient source, to installations for public water supplies when hot is furnished by steam. The system has the advantages of being cleanly and of requiring very little attention.

We have received an interesting catalogue, entitled, "Notes on Electric Lifts," from Messrs. Archibald Smith & Stevens, Queen's-road, Battersea. Tables are given showing the comparative cost of working hydraulic and electric lifts, and the scientific and engineering data given can be checked easily by anyone having an elementary knowledge of electric and mechanical units. The first half of the catalogue gives useful general information, and the latter portion describes the class of machinery made by the firm. We note that lift motors can now be supplied which will work satisfactorily from ordinary alternating current supply mains, and the results published of commercial tests on these machines show that they are perfectly suitable for this kind of work.

We can recommend anyone interested in lifts to get this catalogue.

The Diesel Engine Company send us their catalogue of the Diesel oil engine, constructed for use with liquid fuel, and working upon a new—but now well-known—principle giving the high fuel efficiency of 41 per cent. Unlike ordinary oil and gas engines, the temperature necessary for ignition is obtained solely by the compression of atmospheric air. When the required temperature has been attained in the cylinder by this means, the fuel is sprayed in with a suitable admixture of air at such rate that the temperature and pressure remain practically constant during combustion. Apart from the question of economy, this motor is particularly worth the attention of architects, as the absence of a flame, hot tube, or electric spark igniter, obviates all fire risks. For a similar reason the suitability of oil with a high flash-point is an equally desirable feature. The catalogue illustrates engines in sizes ranging from 40 horsepower to 160 horse-power, and includes detailed particulars relative to the various standard types manufactured.

Messrs. Hartley & Sugden, of Halifax, send us their catalogue of boilers, radiators, and other heating apparatus. This is a book of 120 pages, containing particulars and numerous illustrations of independent hot-water boilers, hot-water boilers for brickwork setting, low-pressure steam boilers, radiators and fittings, hot-water pipes and valves, riveted high-pressure steam boilers, steam heaters and hot-water cylinders, steam-jacketed pans and covers, range boilers, furnace pans, boiler fronts, and sundry fittings. From this summary it will be seen that the range of the apparatus made by this firm covers nearly all that is necessary in connexion with heating and hot-water systems.

The Novelty Rack Co. send us their catalogue of umbrellas and hat stands; the umbrella stands are on the turnstile rack system, which is now well known, in which the handle of an umbrella or stick is held by a revolving clip. The special point in the hat stands is the use of their "new hook," of considerable projection, whereby it is possible to hang up or take down an overcoat from the coat-hook without knocking down the hat.

Messrs. Alex. Boyd & Son have sent us a leaflet describing their "New Double Hot-water Tank System" for domestic hot-water supplies. It is intended for use with hard waters, which are such a constant source of trouble when the single tank system is used. The general principle is not novel, and there is nothing to show for what particular feature a patent is claimed. The tank is double, that is to say, there is a larger tank in which a smaller tank is enclosed. The larger or primary hot tank is fed from a small cistern controlled by a ball-valve, and so placed that the primary hot tank is never quite full. A vent-pipe is taken from the top of this hot tank to any convenient point. Flow and return pipes are fitted between the boiler and the primary hot tank in the usual way, and complete the primary circulation system. The water in this system is not laid on to the ordinary draw-off cocks, and the small loss due to evaporation is automatically replenished from the small feed-cistern. The amount of calcareous or other deposit in the boiler is therefore only the small quantity precipitated by the first charge of water and by the dribbles required to make good the losses by evaporation. The water in the secondary system is entirely disconnected from that in the primary. A feed-pipe is brought down from the main storage cistern and connected to the inner or secondary hot tank in the usual way, and from the top of this hot tank an expansion-pipe is carried up to a point above the cistern, also in the usual way. The branches to the draw-off cocks are taken from the expansion-pipe. It is a defect in the diagram that the main branch is not continued back to the hot tank to form a circulation. The water in the inner secondary tank is heated by the contact of its sides with the hot water in the outer primary tank. The arrangement more usually adopted in systems of this kind is to have the primary tank (or coil, for a coil of pipe is often used) inside the secondary tank instead of vice versa, and we are inclined to think that this is the better arrangement, because deposits may and probably will occur in the secondary tank, and if this is inside the other, as shown in Messrs. Boyd & Son's diagram, the deposits cannot easily be removed. It is erroneous to

say that, because the water in the secondary system "never reaches boiling-point . . . no lime is deposited." Water, very highly impregnated with lime, etc., may part with some of its salts even at normal temperatures, as witness the formation of stalactites and stalagmites in caves. The double tank or cylinder system does, however, undoubtedly reduce the troubles arising from the use of hard waters, and has been adopted in so many cases that it can no longer be regarded as an experiment.

We have received from Messrs. Wilmer & Sons, of Bury-street, St. Mary Axe, E.C., a sheet containing a description and illustrations of Bond's "Patent Sunk-Fire Slow-Combustion Stove." The so-called "stove" is an open fire with a fire-lump body of good shape and 36 in. high to the flue-bend, which is of iron. A peculiarity of the hearth is that it is sloped down about 3 in. from the floor level to the back-hearth, on which the cast-iron grate for the fire rests; this grate is only 3 in. high, so that the top of it is level with the floor of the room. In the illustrations bull-nosed brick surrounds are shown, but metal surrounds can, of course, be used. Cold fresh air may be supplied to a chamber behind the fire-lump body, where it is warmed and from which the warm air is discharged into the room at any convenient level. The construction throughout is simple, and we have no doubt that the grate will give good results.

Messrs. Gaukroger Sykes & Roberts, of Halifax, send us their catalogue of gun-metal steam and radiator fittings. The "Fear-naught" steam valve is of the renewable disc type, now familiar to most steam users, and the radiator valves illustrated are of the angle pattern. Three patterns of gun-metal Peet's valves are included, these being suitable for steam or water. Steam plug cocks and other fittings in daily demand are also described.

BRITISH STANDARD CEMENT SPECIFICATION.

ONE of the most important findings published by the Engineering Standards Committee is the "British Standard Specification for Portland Cement" recently issued. This specification has been prepared by a Committee under the chairmanship of Mr. W. Matthews, C.M.G., and including engineers, architects, chemists, and others, representing the Admiralty, the London County Council, the Royal Institute of British Architects, the Institute of Chemistry, railway and dock companies, the leading contracting firms, and the chief cement manufacturers. The first meeting of the Committee was held in June, 1903, when Mr. Bertram Blount was desired to draw up a preliminary specification for discussion by the members. Twelve meetings have been held, and a large amount of information, collected from engineers, manufacturers, and users of Portland cement, has been carefully collated and considered by the Committee, with the result that the present specification was settled in its final form at a meeting held in November last year, and approved by the main Committee during the following month.

One of the first features which strikes the eye in connexion with this document is its commendable brevity, the letterpress covering only four pages, to which are appended three plates illustrating the dimensions of a standard briquette in the testing machine—the plan and elevation of jaws for holding the briquette in the testing machine, a full-size sketch of a needle for determining the setting time of cement, and a drawing of the apparatus for conducting the "Le Chatelier" test. So far as concerns "Quality and Preparation," the chief point insisted upon is that no material shall be added by the manufacturer other than calcium sulphate or water, to the extent in either case of not more than 2 per cent., but neither of these may be used if prohibited in writing by the consumer. Calcium sulphate, if used in the proportion of 1 to 2 per cent., only has the effect of retarding the setting of cement from a few minutes to several hours, but, if in excess, may render the material "blowy," and for this reason the limitation in the present report is distinctly wise. The clauses regulating sampling for analysis should be equally acceptable to users and manufacturers alike. Samples may be selected either at the manufactory or on the site of the works for execution, and when consignments

of less than 100 tons are supplied, the manufacturer shall, if required, give a certificate for each delivery to the effect that such cement complies with the terms of the Standard Specification, no payment being made by the user for the certificate or for the tests and analyses involved.

With regard to the tests themselves, little exception can be taken. Fineness of grinding is to be ascertained by standard sieves, the first with 76 holes per linear inch and the second with 180 holes. The residue on the first sieve is not to exceed 3 per cent., and on the second is not to exceed 22½ per cent. These stipulations are more exacting than those hitherto prevailing, but, as increased fineness of grinding has been the chief cause of the improvement in the quality of cement during recent years, they should be generally welcomed. We are glad to see that no attempt is made to define chemical compositions, a matter that is almost entirely in the province of the manufacturer, whose business it is to supply a product that will successfully pass the tests relied upon by the user. The only points insisted upon in this clause are that there shall be no excess of lime and that the following percentages shall not be exceeded:—Insoluble residue, 1·5 per cent.; magnesia, which is apt to render cement "blowy," 3 per cent.; and sulphuric anhydride, 2·5 per cent. Tensile strengths are clearly defined for "neat" and "sand" tests, in connexion with which the settlement of a standard form of briquette will abolish a fruitful source of differences in results. Times of setting are fixed for three gradations of cement, designated as "quick," "medium," and "slow," the needle mentioned above being used to ascertain when the cement has set. Soundness is to be determined by the "Le Chatelier" method, which definitely indicates the expansion of the sample by the aid of very simple appliances.

The foregoing are the chief points in the British Standard Specification, the simplicity and brevity of which will commend it to all who use and manufacture Portland cement.

THE QUANTITY SURVEYORS' ASSOCIATION.

THE annual dinner of this Association was held on Thursday last week at the Freemasons' Tavern, Great Queen-street, W.C. Mr. Walter Lawrance, President, occupied the chair, being supported by Messrs. E. Guy Dawber, President of the Architectural Association, W. E. Riley, Superintending Architect to the London County Council, C. H. Bamsley, President of the Institute of Builders, A. J. Gate, London Vice-President of the Association, W. Hoffman Wood, Provincial Vice-President of the Association, A. W. S. Cross, A. A. Hudson, L. Maton, W. W. Thomas, F. B. Wade, F. H. Higgs, W. Hill, Alexander Ritchie, J.P., A. Wade-Palmer, H. England, F. B. Hollis, Secretary, and others.

The loyal and patriotic toasts having been honoured (Mr. W. E. Riley proposing and Mr. A. Wade-Palmer responding to "The Imperial Forces"),

Mr. A. J. Gate, F.S.I., proposed "The Quantity Surveyors' Association and its President." Having referred in eulogistic terms to the President, Mr. Gate said the Association was not a rival to any other society or institution, though a good deal of misconception existed on that point. But he did not mean that it had no enemies, for no Association could be started to repel abuses without making enemies, and they knew that in starting the Association they would make bitter enemies among what he was afraid must be called the blacksheep of the profession, whose practices were, he hoped, to be put down. Then there were those who were next-door to enemies—men who wished to join the Association, but who were not qualified to the extent it was desired that members of the Association should be, and who were consequently refused admission. It was open to these candidates to come up and pass the examinations of the Association, when they would be admitted. As to rivalry, it had been stated that they were in opposition to the Surveyors' Institution, but they were not. That Institution, of which he was a Fellow, had been in existence about thirty-five years, and its membership was from three to four thousand, and its revenue was considerable. Any idea of a young association like theirs being in rivalry with such a powerful body was absurd. It was alleged that there was no room for the

Association because the Institution existed, but that he was bound to traverse. If the Institution were supposed ever to have attempted to do what the Association were trying to do, then it had failed miserably. The status of the quantity surveyor had sunk and was sinking to a degree which they were ashamed to see. It was impossible for the Institution under its present charter to remedy the defects that ought to be remedied. How many quantity surveyors were Fellows of the Institution? Probably not more than 200; in other words, he did not think that 10 per cent. of the Fellows of the Surveyors' Institution were competent to take off quantities, but the letters F.S.I. led the public to think that a man was competent to do this sort of work properly. There were surveyors who would go touting for work, canvassing in a manner that tradesmen ought to be ashamed of, and, knowing that the proper fees for a job were 1½ per cent., would offer to do work at ½ per cent. These things were well known. Quantities taken with the greatest negligence were issued, and yet no redress was ever given. He was prepared to justify what he had said and was willing to give the Council of the Institution information on the subject. The Association proposed to alter all that, but they could not do so unless all reputable quantity surveyors helped them. One man could not fight a system, but when all the best men in a profession would join, any system could be fought. As members of the Association they were entitled to put letters after their names which would be proof to architects and others that they were competent men, for no man was admitted to their ranks unless competent. Even if an incompetent man did succeed in joining the Association, by rule 13—which said that a surveyor belonging to the Association who did not do his work accurately or pay for his errors should cease to be a member—he would soon be compelled to leave them. The rule stated—and this was what the Institution had never attempted to do—that the Council of the Association would inquire into any error made in the quantities by a member of the Association, and if the member was in fault and would not pay then the Association would expel him. Quantity surveyors owed it to their brethren not to try and get all the work they could at unfair prices, and the Association intended to prevent them doing so in all ways it could. A committee had been appointed, and they hoped to agree to a minimum scale of charges that every member of the Association should charge. He was inclined to think that if they did this the Institution would be compelled to follow them, and as a sign of the times he might mention that the Institution had this year elected a quantity surveyor as its President, and had appointed a committee, and had done several other things for the quantity surveyor; and he could not help asking whether they would have done so had there been no Association. The quantity surveyor's duty towards the building owner was to protect him, and when building owners knew what the quantity surveyor did for them they would employ their own quantity surveyors. The principal duty of the surveyor to the builder was to be accurate in the bill of quantities, and as to the surveyor's duty to the architect, and to the surveyor's most difficult to fulfil—i.e., to get behind the mind of the architect and find out what he really wanted. Many difficulties arose and serious extras resulted from surveyors accepting what was drawn and what was written in the specification. Specifications were often ambiguous, and a competent surveyor carefully removed all ambiguity.

The Chairman, in reply, said that Mr. Gate had so fully set forth the objects of the Association that he had left little to say on that score. The Association had not been started without much trouble and difficulty, and now that they had succeeded in getting incorporated it remained for the members as a body to do the rest. He appealed to them not to sit still and wait for everything to be done for them. Every member must give the Association his loyal support. In trying to attain the objects of the Association there was no doubt that the members would have to exercise a little unselfishness, and perhaps at times a little self-sacrifice would be needed, especially in remaining loyal to their brethren by not accepting work below the minimum fees set forth by the Association. If quantity surveying was to continue on the honourable basis of a profession, and a decent living was to be made out of it, they could

not countenance the reduction of fees to the rates at which some men were offering to do quantity surveyors' work. It was simply impossible for work to be done with proper skill and care and a high standard maintained in the bills of quantities they issued if the fees were to be reduced to the equivalent of an office-boy's wages. Those who took a pride in their work and sent it out properly done knew thoroughly well that work accepted at ridiculous fees could only be produced by untrained, inexperienced, and underpaid assistance. They must therefore do what they could to impress upon public bodies and committees the fact that quantities require skilled and experienced assistance in their preparation, and below a certain minimum charge it was impossible to do the work properly. He was sure that all architects of experience knew the value of good work by the quantity surveyor, and appreciated the great assistance which his care was to them in pointing out little difficulties in details of construction which could not be noticed in the preparation of the drawings, and also the great amount of worry and friction saved with the contractor during the carrying out of the work. As to the contractors, there was nobody who appreciated more the value of really good bills of quantities than the experienced estimator, and as they appreciated good work, he must say it was a pity they could not return some of the rubbish which they received as quantities. The well-prepared bill of quantities was in the end by far the greatest economy; it enabled the estimator to calculate his prices to a nicety and also with satisfaction. As to quantities being part of the contract, he had always maintained that if they were it put a premium on bad work. When quantities were part of the contract, the responsibility of the quantity surveyor was taken away, and any mistakes the surveyor made had to be paid for under the contract by the building owner, and that was not right. The article of the Association that Mr. Gate referred to they regarded as one of their strongest points, but it would be nullified with the bills of quantities part of the contract, as then the surveyor was entitled to put into the variation bill any errors on either side, and the building owner had to pay. It was said that if the surveyor made such mistakes he would not be employed another time; that was so, but what redress was afforded the building owner? Another point he might refer to was as to the appointment of surveyors as arbitrators in disputes, especially in measurements and quantities. In the majority of disputed building accounts the quantity surveyor was the most competent man to act as arbitrator. If an architect had enough work to do, he did not want to be bothered with quantities in any way. As to the mode of measurement, he thought it would be one of the best works that the Association could undertake, if they could establish a universal mode of measurement. London quantities were well understood by most estimators all over the country, and in most cases were preferred to any local method, and if a universal method was to be adopted, he thought there was every chance that it would be based on the London practice, but before that could be done London surveyors must be got to agree on a uniform practice among themselves. This being the first dinner of the Association, he thought it was a matter of congratulation to have such a representative gathering. He would ask their Secretary to state a few facts with regard to the Association, and he would take the opportunity of expressing to Mr. Hollis their deep gratitude for the time and attention he had given to the Association.

Mr. F. B. Hollis said that Mr. W. Hoffman Wood might be considered the father of the Association, as it was he who wrote to the *Builder* of January 3, 1903, a letter suggesting the formation of such a body, and he (the speaker) replied in the following issue, and was eventually the means of the Association seeing the light. This was the first dinner, and it was very pleasing to have such a good attendance. They had had upwards of 300 applications for membership, and they had elected 130 members; they had become incorporated, and were recognised as an official body useful to the public; and already they had been recognised by a Public District Council who, in advertising for a quantity surveyor, suggested that applicants should be members of the Association. One of the provincial members of the Association had recently asked the Council for support in a case of litigation over fees for

services rendered, and he believed that assistance would be given. The first examinations were to be held in May next, and he had already received 130 applications for the syllabus. The assistants' employment register was already operating effectively, and there were a number of capable assistants on the register vouched for by responsible members, and he had already satisfactorily answered several applications for assistants. In conclusion, Mr. Hollis referred to the kind and generous help Mr. Lawrence had afforded him and the Association.

Mr. W. Hoffman Wood proposed "The Architects," and asked why architecture was not placed among the learned professions—with law, physic, and divinity? With the toast he coupled the name of Mr. E. Guy Dawber.

Mr. Guy Dawber expressed the thanks of architects to quantity surveyors for their help and assistance. He thought it was a mistake for architects to take out their own quantities, for it put the architect in an entirely wrong position when he had to be, as it were, the judge of his own work. He did not think the architect could take an impartial view of quantities when he took them out himself—but, of course, it was done. With regard to the emoluments of the quantity surveyor, he thoroughly agreed with what had been said. As to the question of drawings, quantity surveyors did sometimes get bad drawings and specifications which were unintelligible, but he thought the matter had been made too much of. A good architect prepared his own details and wrote the specification himself. It seemed impossible for an architect to get to know what he wanted unless he wrote the specification himself, and if that were done we should not hear these complaints about architects. He wished the Quantity Surveyors' Association every success. It had been his privilege to meet only the upright and honourable men of their profession.

Mr. W. R. Hood then suitably proposed "The Contractors," and Mr. C. H. Barnsley responded.

The concluding toast was "The Visitors," proposed by Mr. H. England.

Mr. A. A. Hudson, in response, said he had never met any of the black sheep referred to by Mr. Gate.

Mr. Alexander Ritchie said he had lately rebuilt his premises in Upper Thames-street, and the quantity surveyor engaged in that work certainly was not paid the minimum rate which the Association proposed, but perhaps that was because he was a Scotsman.

THE BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION.

THE annual dinner of the Provident Institution of Builders' Foremen and Clerks of Works was held on Saturday last week in the King's Hall, Holborn Restaurant, when 550 members and friends of the Institution were present. The chair was occupied by Mr. H. W. Horner (Messrs. Ashby & Horner), and there were also present Messrs. C. H. Barnsley, President of the present Messrs. E. T. Hanson, E. J. Butt, Institute of Builders, E. T. Hill, Ernest Horn, H. T. A. Chidgey, J. C. Hill, Ernest Horn, L. Horner, G. Hubbard, T. Rider, Alexander Ritchie, J.P., W. A. Sheppard, T. Stirling, and Deputy Ben Turner, C.C.

The loyal toast having been honoured, The Chairman, in proposing the toast of the evening, "The Provident Institution of Builders' Foremen and Clerks of Works," said that the foreman was a man with many masters to serve—the builder and architect, the architect's client, the clerk of works, the tradesman, the client who called upon him because his bricklayers were putting away the bricks too fast, and "the bone of the builders' life," the sub-contractor—something worse than the sub-contractor lately sprung into existence, i.e., the contractor's sub-contractor. For this reason a builder's foreman had to be a man of many parts, and must have many qualifications. With regard to the clerk of works, it had been his good fortune to come in contact with a great number of these men during his thirty years' connexion with the building trade, and he had ever found them a great help to the builder in carrying out his work and getting matters settled. These were the manner of men who composed the Provident Institution of Builders' Foremen and Clerks of Works. The Institution was not supported wholly by charity, for the members subscribe 3s. 4d. per month, and this was one of the good features of the Institution, for men were induced to be thrifty, and he

appealed to all those in that room to put something away for a "rainy day." As regards the working expenses of the society, the total sum for last year was 40*l.* 1*8s.*, which could not be considered excessive when 3,000 letters, for instance, had to be dealt with. One of the professed objects of the Institution was to maintain the respectability of its members, and an excellent rule was also made that an intending member must have followed some branch as a craftsman of the building trade. Since the first pension was granted close on 12,600*l.* had been paid away, but of course without the annual support of architects, surveyors, builders, and merchants the pensions would not be nearly so large, 1*7s.* 6*d.* per week being now paid. Before he resumed his seat he should like to refer to one who had recently passed from among them, and who so ably filled the chair in the year 1888, *i.e.*, Mr. Thomas Blashill, who lived the life of a thorough English gentleman. The Chairman concluded by appealing for financial help on behalf of this deserving Institution.

Mr. J. Beer, Secretary, in response, said that since its earliest days the Institution had gone on growing, but it needed help because of the many trials of foremen and clerks of works. He was of opinion that one cause of the slackness of trade was the high cost of production, and if workmen paid more attention to quality than quantity one would not hear so much about the unemployed. In these days a foreman was quickly worn out, and on behalf of the Institution he appealed to them for help. One builder's foreman who had just died, and who paid into the funds of the Institution about 40*l.*, had received in pension money over 500*l.*, and another member and his wife had received over 22*l.* for a comparatively small sum paid in. Was there any other institution that gave such help for such small contributions? Two pounds a year was the cost of two ounces of tobacco per week, and yet some men said that they could not afford the subscriptions! The Institution had been in existence over sixty years, and he hoped it would continue to receive the support that had always been given it.

Mr. C. H. Barnsley, in proposing "The Architects and Surveyors," said that much present-day architecture, whether domestic or municipal in character, would, he believed, testify to future ages that for skill and originality it was equal to anything that had been done in the architectural history of the nation. No doubt he had changed in methods and design, but there was no reason for alarm in that, for, as Ruskin said, "No art can be noble which is incapable of expressing thought which does not change." There were also architects who were to be admired for their energy and unselfishness—men who had risen to the highest platform in fame, and yet were willing to sacrifice time and money to incite in the minds of younger men knowledge of a technical character. In the provinces builders and contractors rather envied London builders, for in London there were a number of very able quantity surveyors. If provincial builders could get quantities prepared by London surveyors, he thought that many of them would always be glad to accept the responsibility of those quantities—a thing they were not always willing to do now.

Mr. G. Hubbard responded for the architects, and in doing so he said there were many builders' foremen and clerks of works who did not belong to the Institution, and he thought it was the duty of all the members to get those outside to join them. Those who had joined were laying up for themselves the possibility of living in comparative comfort when their life's work was practically over, and in joining such an Institution they saved themselves many years of doubt and trouble which must come to those who lived upon and spent all their weekly money. As to the registration of architects, he held strong views on the subject. It was not fair to the fully qualified architect that he should be put in competition with the untrained architect. He was glad to notice that that was the view which most of them took, and he was not surprised that they did, seeing that they were all practical men who had to work most of their lives under the architect's guidance.

Mr. H. T. A. Chidgey, who responded for the surveyors, said he thought that the alliance between the foremen and clerks of works tended towards complete efficiency in the carrying out of works they were in charge of.

Mr. Deputy Ben Turner, C.C., then proposed the toast of "The Builders and Contractors." He said he remembered when London was a very

different London from what it is now, and it was in recent years that so many fine buildings had been erected. Both architects and builders were greatly helped in their work by their clerks of works and foremen. In referring to the Building Act Amendment Bill, he said he hoped they were all interested in that, as they should be. That Bill meant confiscation of property; it meant that, should it pass, there would be no possibility of them having a timber yard in London, and he doubted very much whether they would be able to have a joiner's shop in London.

Mr. E. J. Burt suitably replied, and spoke of the advantages to foremen and clerks of works of membership of the Institution.

Mr. F. Hann, Financial Secretary, then proposed the toast of "The Governor (Mr. F. J. Dove), Trustees (Messrs. F. J. Dove, J. Howard Collis, and T. Costigan), Donors, Subscribers, and Visitors."

Mr. W. A. Sheppard having replied, the toast of "The Chairman," proposed by Mr. J. C. Hill, brought the proceedings to a close.

During the evening donations and subscriptions to the amount of 370*l.* were announced, including 25 guineas by the Chairman and 25*l.* by Messrs. Ashby & Horner.

CARPENTERS' HALL LECTURES:

OUR OLD PARISH CHURCHES.

ON Thursday evening last week the Rev. W. Marshall, M.A., F.S.A., delivered the second of the present series of Carpenters' Hall Lectures, on "Our Old Parish Churches," at Carpenters' Hall, London-wall. The lecture was illustrated by a large number of lantern illustrations. In the course of his remarks Mr. Marshall said there were some 9,000 mediaeval parish churches in the country. For close on twenty years he had taken a great interest in the subject, and had visited 586 of those churches, which he had photographed and made notes upon. Dealing with the question of lych gates the lecturer remarked that ancient examples of those gates were very rarely met with, because they were generally made of wood, and, being exposed to the weather, they had decayed. After dealing with the memorial stones to be found in churchyards, Mr. Marshall passed on to a consideration of churchyard crosses, and by means of the lantern showed a number of photographs of such crosses from various parts of the country. One of the photographs was that of the cross in the churchyard at Higham Ferrers, and the working of the stone at the angles into what looked like crockets, but were really imitations of the oak-leaf, was pointed out. One of the most striking of such crosses was the cross at Somersby, the birthplace of Lord Tennyson. A cross which was at once beautiful and interesting was that at East Hagbourne, about 1½ miles from Didcot. This example had a XVII. century sundial in place of the cross head. Passing on to deal with doorways, a number of these were thrown on the screen, among them being a pre-Norman door at Earl's Barton, in Northamptonshire. Another example was a late Norman door from Hales, in Norfolk, and another was the well-known doorway at Adel Church. The porch at the west end of Cley church, on the north coast of Norfolk, was an example of XIVth century work. Much of this church was unfinished, no doubt owing to the occurrence of the Black Death, which plague there was reason to believe was the cause of the large number of breaks to be found in churches which were erected in the middle of the XIVth century. The ironwork on the door of Cley church was remarkable for its beauty. Dealing with the question of church doors, Mr. Marshall said that in the very early days these were always made of great strength, but as time progressed the ironwork with which they were covered assumed a lighter and more decorative style. The handle-plates of church doors were very often splendid examples of metal work. At one time they were forged and worked with punches, quite a different style being evolved when the file came into use. Having touched upon sundials, the lecturer referred at some length to consecration crosses, which he said were divided into three types—those painted upon the plastering of the stone work, those incised in the stone itself, and those made of metal let into a matrix. As illustrating the first-mentioned type he showed a photograph of the cross at Hythe, in Kent; the second type was represented by the cross

at Sellinge, in the same county, and the third, though only the matrix was left, was that at Salisbury Cathedral. Sanctus bells were another interesting feature found in our old parish churches. Generally they were hung on the exterior of the east gable of the nave or chancel, but were sometimes placed on the spire. The bell at Walpole St. Peter, Norfolk, was an excellent illustration of the former type, for it was in a marvellous state of preservation, only the small flying buttresses on the outside of the bell chamber being missing. Dealing with the subject of the chancel screen, Mr. Marshall said that the screens in West Country churches differed from those found in East Anglia in that they went right across the church, aisles and all, and very often had a sort of frieze running along the top. In East Anglian churches the screen was often intercepted by the chancel arch. Commenting on the peculiarities of a number of photographs of screens, the lecturer remarked that it would be observed that in many cases the screens exhibited a somewhat unfinished appearance. That was due to the fact that the roof loft was generally erected over them. He did not know of a single instance where the roof was now remaining over the chancel screen, for they were all swept away during the Reformation. At Croscombe, near Wells, there was a fine example of Jacobean screen work. It was very sad to think how in many churches Jacobean work had been swept away. There was no finer period of wood work than the Jacobean, and it was interesting to note that such work was usually dated. Referring to brasses, Mr. Marshall remarked that he was probably the first person to photograph them. He thought that a photograph gave a far better idea of the feeling of the brass than did a rubbing. The lecturer concluded by exhibiting a number of photographs of church pulpits, including several interesting examples of Jacobean wood structures.

Fifty Years Ago.

OXFORD ARCHITECTURAL SOCIETY.—The first meeting of this term was held in the Society's rooms, in Holywell-street, on Wednesday, the 14th inst., the Rev. the Rector of Exeter College, President, in the chair. The report of the committee expressed satisfaction at the selection of the successful design for the new museum. The President, in introducing the subject proposed for the evening's discussion, "The principles on which stained glass should be designed for use in churches," said that there was much need of some agreement on the very first principles which should guide those who design and erect windows. The Rev. T. Chamberlain, according to the Oxford papers, thought the great end of stained glass in churches was to excite feelings of devotion, and for this reason would exclude everything which did not tend to this end, or was calculated to suggest any other ideas to the mind. On this principle he would exclude mere mosaic pattern windows, and those in which symbols were the main subject, and simple diapers, showing quarries surrounded by coloured borders. As in architecture, he would employ the best of its kind, namely, Second Pointed; so in glass, he would use the style of the XIVth century. As to the subject of naturalism and conventionalism, he was opposed to the grotesque as such, but would studiously avoid in the representation of natural objects anything which might seem sensuous. He condemned mere antiquarianism in glass. The Rev. J. E. Millard maintained that a design for stained glass ought to be entirely subservient to that of the window tracery, and to the general requirements of the fabric. Consequently he considered a regard to colour more essential than even correct drawing, though he was opposed to outlines intentionally grotesque. Mosaic patterns, and groups of small figures in medallions were, he thought, preferable to large independent figures, as they distribute rich and gem-like colours harmoniously, instead of exhibiting broad masses in violent contrast. Such colours should be relieved by a liberal use of white glass. He considered these principles applicable to any style or period. Mr. Parker thought no style of glass was to be absolutely condemned. He admired XIVth century glass above all other, but also considered windows in the style recommended by Mr. Winston, and those now made in Bavaria, as beautiful works of art, and ornaments of churches; and if he

had to fit in a Norman window he should certainly employ glass after the manner of that, for instance, at Canterbury. Mr. Bruton protested, as also did Mr. Chamberlayne, against the use of canopies; he thought mediæval artists would have inserted stone if they were needed. Mr. Parker did not agree with Mr. Bruton in that opinion.—*The Builder*, March 3, 1855.

Illustrations.

DRAWINGS BY MR. R. PHENÉ SPIERS.

IN connexion with the interesting event of the dinner and presentations to Mr. Spiers, recorded in another column, we thought it suitable to devote our illustration plates this week to reproductions of some of Mr. Spiers's fine drawings of ancient work, executed long ago, but which remain among the finest pictorial representations of ancient architecture that can be found.

They include illustrations of the Temple of Jupiter at Baalbek, the Propylæa at Athens, and the columned halls of Esneh and Karnak. Mr. Spiers has kindly added the following notes on the subjects of the drawings:—

TEMPLE OF JUPITER, BAALBEK.

This view of the temple was taken from the north-east in 1866, before the removal of the wall which had been built by the Moslems in between the ante of the portico, possibly to protect the water cisterns which occupied the whole area of the cella and sanctuary. The clearing away of the debris by the Germans has now exposed the podium of the temple and added to its monumental effect. It has, however, destroyed, here as elsewhere, the picturesque grouping which existed in former days.

THE PROPYLÆA, ATHENS.

This view was taken in the shade afforded by the substructure which carries the Temple of Nike Apteros, a very important consideration in Greece, and one which in many cases limits the artist in his selection. In this instance, however, more is shown than is usual, and it is singular that the point of view should not more often have been chosen. At the extreme left of the drawing, down in the plain, is the Temple of Theseus, probably shifted a little to the north to bring it within the picture. The hills in the distance form part of the range in which, further east, are the famous quarries from which the Pentelic marble was obtained. The great pedestal, 55 ft. high, on the left of the drawing, was raised to the memory of M. Vipsianus Agrippa, son-in-law of Augustus, about B.C. 27. Marks on the summit suggest that it supported a chariot and horses. In the centre of the drawing is the Pinacotheca, the name given to the building which flanks the Propylæa on the left, probably because Pausanias, in his description says:—"On the left of the Propylæa is a building with paintings," and then goes on to describe the subjects represented. No traces of painting have been found on the wall, and it has never been decided whether the pictures in question were frescoed or painted on wood. The three columns on the right form the northern half of the portico of the Propylæa, and the pathway in front of the marble steps is that up which the beasts were led to the sacrifice. A fragment of one of the capitals of the Ionic colonnade which carried the white marble roof is seen on the right. This roof seems to have attracted Pausanias's attention, who states:—"The Propylæa has a roof of white marble, and the size and beauty of the blocks were remarkable even when I saw it."

TEMPLE OF ESNEH.

In 1866 only the Hall of Columns of the temple at Esneh had been cleared out, so that this drawing was taken from a high level, displaying more clearly the detail in the capitals. The hall is of late date, B.C. 14—A.D. 69, which shows that the Romans made no attempt, in Egypt, at all events, to introduce their own style.

TEMPLE OF KARNAK, THEBES.

One of the avenues across the aisles of the great Hall of Columns. Owing to the eating away of the foundation of the base of one of the columns, it has fallen over as shown. How long ago this happened no one knows. Quite lately, in consequence of the falling over of a very large number of other columns, restoration has been found necessary to prevent the remainder being knocked over, and this column

has, we believe, been raised and a proper foundation given to it.

ADDRESS TO MR. R. PHENÉ SPIERS.

We give as one of our illustrations a monochrome reproduction of the illuminated address which was presented to Mr. Spiers at the dinner on Monday evening.

The writing was done by Mr. Grailey Hewitt, and surrounded by a most beautiful piece of illumination by Mr. Allan F. Vigers. The original is bright and brilliant in colour, but as we could not reproduce the complete colour design, we thought it best to print it in a sober tint, so as not to suggest any special colour, but merely give the design.

The following is the list of signatures attached to the address:—

London.
R. Norman Shaw
G. F. Bodley
Louis Anblin
T. G. Jackson
Aston Webb
John James Burnet
W. R. Lethaby
W. Curtis Green
E. Guy Dawher
Walter Millard
Robert West Schultz
Allan F. Vigers
Sidney H. Barnsley
F. W. Troup
Theodore Fry
Gerald C. Horsley
Bernard H. Webb
Vivian H. King
Henry W. Stock
Alfred H. Hart
Thomas Henry Watson
John Fullelove
George Harvey
John Borrowman, jun.
James Gandy
Mestford Warner
Rowland Plunbe
T. Raftes Davison
Wilfred J. Hardcastle
Henry A. Saul
Arthur J. Gale
W. T. Curtis
George J. J. Lacey
Ascl Herman Haig
Howard Ince
H. R. Hope-Pinker
Herbert Wigglesworth
W. Annonier
David Barclay Niven
Chas. H. M. Milham
Alfred J. Shirley
W. Harvey
T. M. Rooke
Ernest Newton
Percy Bigland
Henry L. Florence
T. Blake Wigram
Jas. B. Fulton
Stanley Hamp
B. R. Hughes
S. Giddons Fisher
Philip J. Marvin
J. J. Stevenson
F. Hamilton Jackson
Matthew Webb
Geoffrey Lucas
T. Erat Harrison
Charles Holroyd
Herbert A. Bone
C. Harrison Townsend
T. R. Spence
Emory Walker
W. H. Hallam Murray
W. H. Margeson
George Frampton
Albert Offe
Sidney Paget
G. Woollicott Rhead
Henry Hall
Harry Redfern
R. W. Collier
Fred. M. Marks
Thos. E. Colclutt
Wm. H. Atkin-Berry
C. J. Tait
Ed. J. May
A. Maryon Watson
S. Gieseler Parry
C. J. Harold Cooper
Francis Hooper
Arthur Stratton
Keith D. Young
Ronald P. Jones
R. S. Balfour
James Paxton
Arthur T. Bolton
C. Lovett Gill
Hugh Stannus
Leslie Wilkinson
P. Dare Clapham
Norman Evill
Herbert Read
R. Falconer MacDonald
Maxwell Ayrton
William A. Pite
Thos. Edwin Pryce
Herbert C. Corlette
Charles J. M. Marshall
E. J. Milner Allen
F. T. W. Goldsmith
A. R. Brede
Graham Petrie
H. Walter Lonsdale
Walter Cave
Walter L. Spiers
Hugh P. G. Maule
Herbert Batsford
H. L. Goddard
H. Heathcote Statham
Horace Field
G. Thos Smith
Wm. Woodward
H. D. Seales Wood
Michael Bunney
William G. B. Lewis
Percy N. Glanville
W. Howard Seth Smith
C. E. Malloes
Alfred East
Arnold B. Yeates
A. H. Tadmira
A. H. Christie
S. Flint Clarkson
Frederic Branch
John W. Simpson
Cole A. Adams
Ernest George
John Fullelove
Arch. C. Dickie
J. W. Penfold
Henry Tanner
J. Oldrid Scott
Wm. Murray
Francis J. Hames
Mortimer G. Peckell
Philip A. Robson
Arthur Blomfield
Eustace Corrie Freere
A. N. Prentice
A. E. Brooker
Thos. Stirling Lee
Edward S. Prior
A. Tessel Tiltman
Stephen J. B. Stanton
R. Stephen Ayling
Alfred C. Bosson
Arnold S. Taylor
H. P. Burke Downing
Leonard Stokes
Thomas B. Whimney
Wm. Emerson
Edmund Woodthorpe
Reginald Blomfield
Charles Henman
F. M. Simpson
Alexander Graham
W. J. Locke
John Taylor
Maurice B. Adams
Thos. M. Riekman
Richard J. Lovell
Arthur C. Martin
Philip A. Bedford
Allan George
Francis Bond
H. R. Drury
Peter Anderson
E. B. T. Anson
R. D. Adeshead
Wm. H. Drury
R. Elsey Smith
Albert W. Cleaver
G. H. Palmer
H. Percy Adams
Robt. Robertson
Arthur E. Street
Thomas W. Cutler
A. R. Jemmett
Paul Waterhouse
H. R. Goodham
J. Douglas Matthews
Henry Longden
John Murray
John Taylor
Charles R. R. Clark
John Belcher
H. O. Crosswell
W. D. Carde
Walter Crane
Ernest Crofts
T. G. Davidson
E. A. Gruning
W. Goscombe John
Prof. E. Lanteri
Philip Norman
F. L. E. Pither
A. B. Pite
R. F. Strange
S. J. Solomon
Frank Spiers
H. Tanner, jun.
Sidney Vacher
F. T. Vestey
E. W. M. Wonnacott
E. P. Warren
W. E. Riley
James Crook
Macvicar Anderson
George Simonds
Wm. Flockhart
J. Parsons
T. E. Knightley

Frank Fox
P. Forbes Glennie
Douglas Cockrell
Lewis H. Isaacs
George Elkington
George Weald
Bradley Batsford
W. Campbell Jones
George Sherin
W. Hilton Nash
W. Church Howate
Henry D. Davis
John E. Sears

Provincial.
Thomas Worthington, Manchester.
Percy S. Worthington, "
J. W. Beaumont, "
S. Tennant S. Capper, "
J. Holden, "
Paul Ogden, "
Alfred Darbyshire, "
Alfred E. Corbett, "
John Swarbrick, "
Fra H. Newberry, "
Alex. C. N. Paterson, Glasgow.
Wm. H. Howie, "
John Thomson, "
John Watson, "
Henry D. Walton, "
Alex. W. Gibbon, "
W. H. Bidlake, Birmingham.
William Henman, "
H. L. Goddard, Leicester.
Chas. J. Allen, Sheffield.
Edwd. M. Gibbs, Sheffield.
H. L. Paterson, "
John Wilson, Hull.
Edmund Sedding, Plymouth.
T. Rogers Kitsell, "
W. E. Barry, Scarborough.
Seggy Owen, Warrington.
John B. Gass, Bolton.
Sydney Tugwell, Bournemouth.
Wm. Fawcett, Warrington.
George Causen, Newport (Essex).
Arthur S. Flower, Aidsburgh.
Frederick C. Lees, Stroud (Glos).
Alfred H. Parnell, Bromsgrove.
R. M. Gruggen, Bristol.
L. C. Riddett, Ryde, Isle of Wight.
G. Baldwin Brown, Edinburgh.
James A. Morris, "
James Cromer Watt, Aberdeen.
Arthur Ernest Barnsley, Cirencester.
C. R. Ashbee, Chipping Campden.
George P. Banks, Bromsgrove.
Robert Anning Bell, Didcot.
Thomas Drew, Dublin.
Thos. M. Deane, Dublin.

Foreign.
John Begg, Bombay India.
W. Bellis-Gwynne, Calcutta, India.
S. S. Jacob, Jeypore, "
I. S. D. Ahmad, Rajapur, "
H. L. Tomalin, Kandy, Ceylon.
Percy E. Nobbs, Montreal, Canada.
Cecil Scott Burgess, "
W. Howe Greene, St. John's Newfoundland.
Herbert Baker, Johannesburg, South Africa.
Francis Edward Massey, Cape Town, South Africa.
W. Bevan, Pretoria, South Africa.
F. K. Kendall, Cape Town, South Africa.
T. A. Stoddin, "
A. Wyatt Papworth, Cape Town, South Africa.
Herbert Walker, Port Elizabeth, South Africa.
Reginald G. Kirkby, Pietermaritzburg, South Africa.
John Sulman, Sydney, Australia.
G. J. Oakeshott, Sydney, Australia.
R. M. Hamilton, Perth, Sydney, Australia.
S. Hurst Segar, Christchurch, New Zealand.
F. de J. Clare, Wellington, New Zealand.
C. J. Mountfort, Christchurch, New Zealand.
H. W. Bird, Hong Kong, China.
L. G. Bird, Hong Kong, "
W. A. Watwood, Milton, U.S.A.
R. S. Peabody, Boston, Mass., U.S.A.
Charles F. McKim, New York, N.Y., U.S.A.
R. N. Robertson, New York, N.Y., U.S.A.
Robert W. Gibson, New York, N.Y., U.S.A.
Charles K. Cummings, U.S.A.
W. Tyson Gooch, New York, N.Y., U.S.A.
R. E. Robertson, New York, N.Y., U.S.A.
William T. H. Cuyper, New York, N.Y., U.S.A.
Herbert Jacques, Boston, Mass., U.S.A.
Charles A. Cummings, U.S.A.
Robert Day Andrews, Boston, Mass., U.S.A.
Frank Miles Day, Philadelphia, Pa., U.S.A.
T. MacLaren, Colorado, U.S.A.
J. Bevan Phillips, Douglas, Wyoming, U.S.A.
Francis H. Bacon, Boston, Mass., U.S.A.
J. L. Pascal, Paris, France.
A. Choley, Paris, France.
C. Barlaumeux, Paris, France.
Baron H. von Geymüller, Baden Baden, Germany.
William Scott, Bordighera, Italy.
L. Beltrami, Milan, Italy.
Professor Rodolpho Lanciani, Rome, Italy.
S. Giampietri, Rome, Italy.
M. Belmes, Madrid, Spain.
B. M. Repulles y Vargas, Madrid, Spain.
Dr. P. J. H. Cuyper, Amsterdam, Holland.
T. T. Cuyper, Amsterdam, Holland.
J. A. Van Straaten, Junr., Amsterdam, Holland.
Jan Stuyt, Amsterdam, Holland.
H. P. Berlage, Amsterdam, Holland.
Alfred Boyll, Tenerife, Canary Islands.
C. J. S. Hall, Puebla, Mexico.
Kingo Tatsuno, Tokyo, Japan.
Kuro Sakurai, Kure, Japan.
Tatsuno Sono, Tokyo, Japan.
T. Sutsuki, Tokyo, Japan.

APPOINTMENT OF SANITARY OFFICERS.—The Local Government Board has sanctioned the appointment of the undermentioned sanitary inspectors in the City of Westminster:—Mr. A. L. Ware and Miss M. Carey.

CONGREGATIONAL CHURCH, SHREDSBROOK.—Messrs. Williams, Brothers, & Co. (Chester) ask us to mention that their firm executed the leading glazing in the above-named church, the opening of which was recorded in our last issue.

THE BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

The Annual General Meeting of this Institution was held on the 28th ult. at 21, New Bridge-street, E.C., Mr. J. Carmichael, President, in the chair. Among those present were Messrs. F. Brooks (the Hon. Treasurer), H. W. Parker, F. S. Oldham, Newling, Mackness, Gammon, Tarrag, R. Barrett, and J. Austin, Secretary. The report and balance sheet, which were adopted, showed the actual income of the past year to have been just upwards of 777. During the year 1904, has been disbursed as annual pensions (241 each to twenty-four widows and 301 to one aged clerk), also 61. granted as temporary relief. In addition, two orphans are being maintained and educated at the Orphan Working School, Haverstock Hill, per presentation of the Institution.

The adoption of the report was moved by the President, who stated that the employers had the interest of the employees at heart, and he felt sure master builders would support the work of the Institution.

Mr. R. Barrett seconded, and the motion was agreed to.

THE SURVEYORS' INSTITUTION.

The usual fortnightly meeting of the Surveyors' Institution was held on Monday at No. 12, Great George-street, Mr. A. T. Steward, President, in the chair.

A donation to the library fund having been announced and a vote of thanks accorded to the donor, Mr. Harold Griffin read a paper on "Some Proposals for Improving the Law and Practice of Rating." Mr. Griffin said the Valuation Bill of 1904 indicated an intention on the part of the Government to amend the law relating to the assessment of property for the purpose of rating and taxation, and it was announced in the King's speech at the opening of the present Session of Parliament that the Government proposed to introduce a new measure this year dealing with the same subject. As, therefore, legislation was impending, the views of surveyors who are practically acquainted with the difficulties surrounding the subject could not be too widely made known. Where a Committee of a Board of Guardians had hitherto acted as the Assessment Committee of a district they had usually performed their duties in an able and impartial manner, and he saw no objection to such Committees being made the authority for hearing appeals, as they are in some parts of London and in the provinces. He had never heard it proposed that overseers should sit on Assessment Committees, and now that in London the Metropolitan Borough Councils were made the overseers of parishes within their boroughs, it did not seem right that a committee of such a council should adjudicate upon appeals from their own assessments, even if representatives from the London County Council sat with them. The London County Council and the Metropolitan Borough Councils held so much rateable property themselves as actual occupiers, that it must be difficult for them to perform the duties of hearing appeals in an impartial manner. He thought that the local Bench of Justices would be a more suitable body to act as an appeal committee.

In connexion with the hearing of appeals, the practice was for the appellant, after he had stated his case to the Committee in the presence of the overseers, and replied to questions put to him by both of these bodies, to be asked to retire while the Committee considered their decision in the presence of the overseers. This was not proper, and the overseers should also be asked to retire.

It had been customary before the last two or three quinquennial valuations in London for the London County Council to summon a conference of all the Metropolitan local rating authorities for the purpose of drawing up rules to be observed at the forthcoming valuation. The report of the conference held in 1904 had just been published. Some of the rules were reasonable, and he would only refer to those which seemed to him to be open to objection.

2nd No. 1.—Weekly and Monthly Tenancies.

That in converting weekly and monthly tenancies into hypothetical yearly tenancies for the purpose of rating (including water) and house duty (if any) shall be based on the annual amount receivable by weekly or monthly payments, which deductions are estimated at from one-fourth to one-third, according to the amount of the rate in the pound.

3. That in cases of artisans' dwellings each tenement shall be regarded as a separate hereditament for assessment purposes.

Note.—Allowance for the additional expense of a

caretaker and common staircase may be considered as included in the statutory deduction.

(c) That for the purpose of ascertaining the scale to be adopted for assessing weekly and monthly properties, an average of the rates for each particular parish for the five years previous to the quinquennial valuation year be taken, and that such scale be adhered to throughout the quinquennium.

If the deductions from the annual full rents to find the gross value were fair in the case of cottage property, how could it be also fair in the case of tenement houses and blocks of dwellings to say that the additional outgoings for cleansing and lighting the common staircase were to be considered as included in the statutory deduction from gross to rateable value?

The stipulation that the average rates for the five years preceding the year in which the new assessment was made should be adopted as the basis for the scale on which the rating was to be fixed for a period of five years, beginning in the year subsequent to that in which the assessment was made, was open to serious objection. The upward tendency of the rates had lately, in many places, been so rapid that the difference of one year earlier or later in the period selected for an average might make a substantial difference.

Rule No. 3 attempted to define the method for the assessment of properties let on lease, but in a great majority of cases the value could be more easily and satisfactorily ascertained by evidence of the actual annual value and by comparison with the rentals being obtained from similar premises close by.

In dealing with freehold and long leasehold properties (presumably in the owner's own occupation) Rule No. 4 sets out the general principle of rating. "That the rent which a yearly tenant might be expected to pay shall be taken as the gross value." This apparently limited the application of the rule to a particular class of property, whereas the principle could be usefully employed as a primary consideration on a much more extensive scale.

Rule No. 5, "That in the case of any two or more houses in the same street or road containing the same number of rooms, and alike in every particular as to accommodation, but let at various rents, the average rent shall, unless there are exceptional circumstances, be taken as the basis of assessment," enunciated what was called the "Terrace Principle," which he considered altogether erroneous and unjust. Every hereditament should be assessed on its own merits, and the value of adjoining premises should be used only as a guide and not as a hard and fast rule to determine the value of ten or twenty adjoining and apparently similar houses. The actual rents of these houses might vary considerably, and wherever this was so there were nearly always circumstances which would account for the discrepancy. Surely these were the exceptional circumstances referred to in the rule. If this was admitted the rule became inoperative, but his contention was not accepted by many assessment committees.

Rule No. 14 contained a stipulation which was, he thought, very improper. It was that newly-erected premises should be assessed although not yet occupied. How could this be done legally? Surely when any property was inserted in a provisional list, notice must be given to the occupier, but in such a case as referred to in that rule there was no occupier.

If the system of general quinquennial re-assessment in force in London was to be applied to the rest of the country, as was intended by the Bill of last session, great practical difficulties would result unless a fair proportion only were reassessed in each year. The pressure of professional work during the time the valuation lists were being prepared and revised by the Assessment Committees was tremendous, and if similar proceedings were to go on simultaneously all over the country, the authorities and ratepayers must be to a great extent deprived of the services of the counsel and the surveyors most experienced in that class of practice.

Outside London a ratepayer could appeal against the assessment on his premises practically at any time, but in the metropolis, unless the authorities made a new assessment, a ratepayer could only appeal against the valuation list made every five years, during the twenty-five days allowed for objections after the list had been deposited. As it seemed probable that the quinquennial system of assessment might be extended all over England, it appeared to him very important that ratepayers should have the right of appeal at any time without reference to the quinquennial valuation.

There must, of course, be proper times for giving notices, etc., but the penalty of sending them in too late should not mean a delay of more than one year in the hearing of the appeal.

The right which at present the overseers had of appealing to quarter sessions against the decision of an Assessment Committee who had reduced an assessment should be considerably restricted. No ratepayer would run the risk of an appeal to quarter sessions unless the amount at stake was substantial, as even if the Court made a sensible reduction in the assessment, it did not always give the appellant his costs, and a ratepayer was very heavily handicapped when he had to go to quarter sessions.

He was quite aware that he had not exhausted the topics which might be enlarged upon in connexion with rating, and that there was room for wide difference of opinion on most of them; but, if their discussion would assist in placing the individual ratepayer on terms of equality with the powerful bodies who were often his adversaries, that paper would not have been written in vain.

On the motion of Mr. Edgar Harper, seconded by Mr. Castle, a hearty vote of thanks was accorded Mr. Griffin for his paper.

It was announced that the next meeting will be on March 13, when a paper will be read by Mr. E. Morton on "Surveyors' Reports and Certificates."

The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

III.—NEW SESSION HOUSE, OLD BAILEY, AND COUTTS' BANK, STRAND.

THE opportunity of viewing two new London buildings of considerable importance attracted a large attendance of members of the Architectural Association on the occasion of the third spring visit on Saturday, the 25th ult.

At the Old Bailey Sessions House the visitors were taken over the building, in the absence of the architect, Mr. E. W. Mountford, by his representative Mr. F. D. Clapham, who gave much valuable information respecting the work which at the present time is in a very unfinished state. We have at various times referred to this important design and to its famous predecessor; on June 30, 1900, however, we gave illustrations of the plans, elevations, and views of the exterior and interior of the new building, and although it is now enveloped in a forest of scaffolding, we could not see that any material departure had been made from the competition drawings. The interior, however, has been improved in many points of detail, but to the exterior, which would appear to require a bolder treatment, we hope to refer at some subsequent date. There is, however, promise of some excellent ultimate effects in the working out of the courts and waiting halls.

In course of construction various discoveries of archaeological interest have been made, notably the foundations of the original New Gate and a length of over 150 ft. of the ancient Roman wall. We gave, in our issue of November 17, 1900, a sketch of a fragment of the latter, showing the rubble walling and red-tiled bands which is typical of Roman work.

The new building, costing 282,000*l.*, stands upon a 5 ft. concrete raft placed about 35 ft. below the level of Newgate-street on a clay sub-soil, and a thickness of 12 ft. of concrete is obtained to receive the central masses and dome. In consequence of an extensive system of plenum ventilation, a large amount of extra basement work was required; here are to be seen great chambers and air ducts with rounded corners and angles and all the multiplex parts which add enormously to the cost of the structure.

Iron, concrete, and brick are the constructional materials, and it is not a little disconcerting to see the yellow Mansfield stone, with which the interior is principally faced, applied to the carcass in the manner in which terra-cotta or faience are usually employed. There is a better feeling in the inner dome, where the stonework is performing constructive work. The colour is most pleasant and the detail is well considered in view of the peculiar lighting. Comparatively speaking, little inner daylight is provided within such a large area of site built upon, and we are doubtful of the results in this respect in certain of the corridors.

The base of the fronts is of Cornish granite, and the whole of the superstructure faced in

Portland stone, worked entirely by machinery. This latter element accounted for the unpleasant smoothness seen throughout the masonry. The central dome is to be built of steel and concrete and covered with copper.

Many varieties of marble are to be used in the internal decoration, and various well-known artists will enrich the surfaces at disposal with sculpture and painting; to all of this, however, we shall refer when the great work is nearing completion.

By the kind courtesy of the partners of Messrs. Coutts & Co. the members had the privilege of viewing their new banking premises in the Strand. Mr. J. McVicar Anderson, the architect, was prevented from attending, but an able substitute was found in his son, who exhibited working drawings and discoursed upon the design and upon the methods resorted to in making the building fire and burglar proof.

The premises, as is now well known, occupy the site of the Lowther Arcade, which was demolished when the bankers acquired a Crown lease of the ground. The nature and history of the previous buildings are not without interest, and we would refer our readers to detailed references in the *Builder* of June 8, 1901, and May 10, 1902, for such information.

Although the site has great length, the two end frontages are comparatively narrow, leaving some difficulty in lighting the interior portions. The type selected by the architect is that of the basilica, in which the central space is lighted by clerestory windows and the aisles or side spaces by small domed lights. This, he considers, in some notes applied to the visitors, is the historically correct form for a bank. A very successful and adroit use is given to the apse in masking the acute angle made by the main front with the axis of the interior; the illusion would have been even more complete if the pier in the centre of the apse had been a recess or void.

Many of the time-honoured customs practised in the old premises are retained in the new building. There are, for instance, no partners' rooms, but principals and clerks work together. Ostentation, either in personal matters or in the decoration of the interior, is entirely absent, and this quality has influenced the design throughout, although the dignity of the establishment is in no wise impaired in the classic treatment.

The basement is principally utilised for strong rooms, the ground floor for the actual business of the bank, and the upper floors, fronting the Strand and Adelaide-street only, for resident officials' quarters and domestic purposes.

Portland stone is again the material employed in the fronts, while the roofs are covered with green Westmorland slates. The internal walls above the oak dado are distempered in plain colours; glazed or polished surfaces so much sought after in these days are singularly absent, save for the marble floor. The general internal effect, although disturbed by an oak screen, is satisfying and restrained.

THE LONDON COUNTY COUNCIL.

The ordinary weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring Gardens, S.W., Mr. J. Williams Benn, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Paddington Borough Council £833, for contribution towards cost of reconstruction of Westbourne Park bridge, and Wandsworth Borough Council £1,400, for contribution towards cost of street improvements.

Jobbing Works—Schedule of Prices.—The General Purposes Committee brought up the following report, the recommendation being agreed to:—

"The Council has recently, on the recommendation of the Education Committee, referred to the Works Committee for execution certain drainage and other works at schools. As no bills of quantities were prepared for these works, which are being done under the supervision of the architect (Education), it was proposed that they should be measured up and valued under the schedule in force for architectural jobbing works. That schedule, however, does not provide for the special work involved in the drainage of schools and similar work, and the architect (Education) and the manager of works suggest that the prices in the schedule in operation under the late School Board for London, plus 1½ per cent, should be adopted as the basis on which the value of the works in question should be calculated. We are of opinion that the suggestion should be adopted. We recommend that for the purpose of calculating the value of certain drainage and other works at schools which have been referred to the Works Committee for execution as jobbing works, the prices in the jobbing works schedule in operation under the late School Board for London, plus 1½ per cent, be adopted."

New Medical Officer.—The Establishment Committee recommended that Mr. A. A. Musson (Liverpool) should be appointed assistant medical officer in the public health department at the commencing salary of £500, a year, rising to £800, a year. In accordance with the standing orders two other names were submitted, and on the motion of Mr. Spokes an amendment was, after discussion, adopted to the effect that Mr. Wanklyn (London) should receive the appointment.

Indication of Houses of Historical Interest.—On the recommendation of the Local Government Records and Museums Committee, it was agreed that the undermentioned houses of historical interest be commemorated by means of memorial tablets:—(a) No. 12, Savile-row, W. (George Grote); (b) No. 10, Upper Cheyne-row, Chelsea. (Leigh Hunt.)

The London Building Act.—On the reception of the report of the Parliamentary Committee, Mr. Phillimore asked the Chairman whether the Committee would issue a memorandum on the Building Act Amendment Bill, so as to make some points clearer.

Sir Thomas Brooke Hitching asked whether, in view of the general opposition to the Bill throughout London, the Chairman would take into consideration the desirability of withdrawing the Bill, and so saving the ratepayers' money.

Mr. Napier said the Committee had already considered the possibility of issuing a memorandum, and at the last meeting of the Committee it was decided not to issue it at the present time. It might be possible to do so later on. The Committee would continue to press on the Bill with all the strength it has in its power.

The New County Hall.—In reply to Colonel Rotton, Mr. Cleland, Chairman of the Establishment Committee, said that the committee has had the question of a site for a new hall under discussion on more than one occasion, but they had come to no final decision on the matter. Whenever they did arrive at such a decision, they would see that it was immediately reported to the Council.

Other business was transacted, and the Council adjourned.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Lewisham.—A house on the southern side of High-road, Lee, to abut upon Rembrandt-road (Mr. A. S. Gover for the House Property and Investment Company, Ltd.).—Consent.

Lewisham.—Open porches in front of proposed houses, Nos. 9, 10, 11, and 12, Murillo-terrace, High-road, Lee (Mr. A. S. Gover for the House Property and Investment Company, Ltd.).—Consent.

Hackney, South.—Deviation from plans for the erection of additions to a building at No. 17, Sutton-place, Hackney, to abut upon Urswick-road, so far as relates to the addition being erected in the position shown (Mr. J. Hamilton for Mr. T. C. Wootton and Messrs. Barlow & Son).—Consent.

Lewisham.—A dwelling-house on the eastern side of Salehurst-road, to abut also upon Manwood-road (Mr. J. W. Webb).—Consent.

Fulham.—Buildings on sites on the west side of Munster-road, Fulham, abutting upon the north and south sides of Colehill-lane (Mr. J. T. Brown).—Consent.

Lewisham.—A porch at No. 12, Homecroft-road, Sydenham (Mr. A. T. Haines for Messrs. Cakebread, Robey, & Co.).—Consent.

Lewisham.—Six houses on the southern side of Coddington-hill, Brockley-rise, Lewisham (Mr. V. Vagnolini for Mrs. S. K. Standen).—Consent.

Strand.—Two projecting signs at No. 149, Oxford-street (Messrs. S. Jones & Co. for Messrs. Crane & Sons).—Consent.

Width of Way and Lines of Frontage.

St. Pancras, West.—A projecting porch at Rowton House, Arlington-road, Camden Town (Sir Richard Farrant for Rowton Houses, Ltd.).—Consent.

Clapham.—An addition and projecting steps in front of the chapel situate between Nos. 13 and 15, Clifton-street, Wandsworth-road, Clapham (Mr. E. W. Collins for the building committee of the Howard-street Gospel Mission).—Refused.

Width of Way and Space at Rear.

St. George, Hanover-square.—An addition at the rear of the London Soldiers' Home, No. 6, Eccleston-street, St. George, Hanover-square, to abut upon Eccleston-street East (Mr. R. Curwen for the London Wesleyan Soldiers' Home Committee).—Consent.

Space at Rear.

Strand.—Alterations at the rear of the Hotel Dieudonné, Nos. 7, 9, and 11, Rydes-street, St. James (Mr. W. Woodward for Mr. C. Guffanti).—Refused.

Deviation from Certified plans and Projections.

Strand.—Certain deviations from the plans certified by the District Surveyor under section 43 of the Act, so far as relates to the proposed rebuilding of Nos. 223 and 229, Piccadilly, and No. 39, Haymarket, and do consent to the erection of projecting oriel windows, angle turret, and balconies to the new building (Mr. W. Woodward for Messrs. Marshall).—Consent.

Means of Escape from the Top of High Buildings.

Marylebone, West.—Means of escape in case of fire proposed to be provided in pursuance of section 63 of the Act on the fifth (top) story of Nos. 376 to 384 (even numbers only), Oxford-street, Nos. 1 to 7 (odd numbers only), James-street, and Nos. 1, 2, and 3, Bird-street, St. Marylebone (Messrs. A. E. Hughes & Son).—Consent.

Space at Rear and Means of Escape from the Top of High Buildings.

Holborn.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building upon a site on the east side of Southampton-row, Holborn, abutting also upon the south side of Fisher-street and north side of Eagle-street (Messrs. Bradshaw & Gass for the Royal London Friendly Society); that Messrs. Bradshaw & Gass be informed that the Council has considered the plans submitted by them on behalf of the Royal London Friendly Society, showing the means of escape in case of fire proposed to be provided in pursuance of section 63 of the Act on the seventh (top) and sixth stories of a building upon a site on the east side of Southampton-row, Holborn, abutting also upon the south side of Fisher-street and north side of Eagle-street.—Consent.

The recommendations marked * are contrary to the views of the local authority.

ARCHITECTURAL SOCIETIES.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—A meeting of this Association was held on the 17th ult., when Mr. William Henman read a paper on "The Future of Our City." How little people thought of the effect of architecture on the character of a town or city, said the lecturer, was only too apparent. Notwithstanding many excellent qualities possessed by Birmingham as a town, there was an absence of a collective taste in art. Individual taste and artistic spirit existed, but this failed in its effect through a want of collective appreciation. They must do something to broaden this artistic spirit, and to create an interest in the architecture of our streets, so that an ugly building offends as would a discordant sound. After giving his impressions of Birmingham on his first visit thirty-three years ago, he observed that he might say without hurting the susceptibilities of those native to the city, that there was still ample room for improvement. There had been too much self-gratification displayed since Birmingham was called the best governed city in the world. Mr. Henman asked the hearers whether, from an architectural standpoint, Birmingham had kept reasonable pace with its prosperity? The new Corporation street might, continued Mr. Henman, be made an ornament to the city or the very opposite. He regretted that the street was begun under the Workmen's Dwellings Act rather than as a street improvement. The line adopted for it was by no means the best available. Many of the streets crossed at awkward angles, and the older streets were damaged as business thoroughfares. They must be thankful for its features. They must be thankful for its features, however, in that it had provided an airy thoroughfare and had given character to the city. The city authorities and the land and property owners might unite to make Birmingham what it ought to be. He suggested improvements between Paradise-street and Five Ways, and on land between the Prince of Wales Theatre and Easy-row, in the neighbourhood of the Crescent. He saw a site for the new Cathedral.

clergy house, and other public buildings. Easy communication could be obtained between the centre of the city and Bordesley by a continuation of New-street. The Lord Mayor and General Phelps, who were present, spoke in appreciation of the paper, and a vote of thanks was passed to Mr. Henman.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—At the rooms of this Society on Thursday, the 25th ult., Mr. Maurice B. Adams read a paper on "Public Libraries, their Building and Equipment: A Plea for State Aid." Mr. C. R. Bulmer, President, presided. The lecturer said that this was a paper mainly dealing with the requirements of to-day, and therefore, by way of introduction, there need be no hesitation in his claiming their indulgence if he emphasised the importance of a comprehensive, not to say a liberal-minded, survey of the whole question of library legislation, presenting as the subject did one of the serious problems of our time. Retrospectively the story concerning the origin of libraries and their subsequent history abounded in incidents of the utmost interest. The earliest libraries known were the famous "Record Office" at Kouyunjik, founded more than twenty-five centuries ago, and the library of the great temple at Nippur, discovered four years ago by Dr. Peters, of New York, carried back Babylonian civilisation to 7,000 B.C., though no document was found at Nippur of later date than 2280 B.C.; and the great library of Pergamon, founded 200 B.C., which contained 200,000 volumes. Prior to entering upon any discussion about the special arrangement of library buildings, it would be convenient briefly to allude to the subject of library provision in its wider aspect. This reference brought them face to face with the stern realities of what was called the "penny rate," which had been fixed more than fifty years ago, but, as the law now stood, any town could by special Act of Parliament augment its penny rate for library purposes, and twenty-eight boroughs, with satisfactory results, had done so. It required little imagination to realise what a direful struggle to make ends meet in many a small town must be experienced with only a penny rate, and in most places the attempt was practically impossible. If in fairly large towns the penny rate was not enough, the whole thing in villages became preposterous, and the lecturer thought that the Board of Education should have powers to include library enterprise when making grants for educational purposes. The system of State aid for libraries obtained in Canada, Australia, South Africa, and the United States. The Central Library at Boston, U.S.A., cost 473,000*l.*, and contained 800,000 books, with ten branch libraries besides, averaging 20,000 volumes each. The yearly cost of maintenance was 52,000*l.*, out of which the city purse provided 47,000*l.* They now came to the initial question in the planning of a public library, as to the respective proportion of space which should be allowed to the different departments in allocating the available superficial area. A roomy and even spacious entrance-hall was essential. According to the usually accepted régime in proportioning the floor area of a library with a closed lending department, the following allocation of space for every 10,000 ft. superficial had been recommended, viz., 3,000 sq. ft. for newspapers, 2,000 sq. ft. for magazines, 2,000 sq. ft. for the reference department, leaving 3,000 sq. ft. for the lending library. With regard to the position of the librarian's room, he thought it ought always to be next the reference-room and close to the lending library. [A full reprint of this paper will be found in the R.I.B.A. *Journal* of the 25th ult.]

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—A meeting of this Society was held on Thursday last week in the Society's rooms, Leopold-street, Sheffield. Mr. T. Winder, President, in the chair. A lecture on the "Curvilinear Period of Gothic Architecture" was given by Mr. Mitchell-Withers, who briefly enumerated the terms under which this period was known by different writers, such as "late decorated," "the flowing period," but considered that Sharpe's term of "curvilinear period," dating from 1315 to 1380, was the most satisfactory. After a brief historical note of the political state of England at that time, and of the impoverishment of the country by the wars which had preceded this period, he referred to the variation of type that was found necessary to meet the needs of the people in the new churches that were erected, and showed how the best illustration of this occurred in parish

churches. The ground plan of the building, he stated, was marked rather by the convenience and extra spaciousness obtained, especially in the naves of the churches, than by any departure from the general arrangements of the preceding geometrical period. He dealt next with the nave arcades, stating that the spaces between the piers were wider than hitherto, and that the piers themselves were often lighter and usually placed diagonally with the axis of the church, while the triforium was often entirely omitted and in other cases was of much less importance, being usually then treated as a continuation of the clerestory which became a much more important feature in the period. Leaving the interior for further detailed consideration, he proceeded to speak of the exterior of the buildings, pointing out the variations that were in progress through the altered requirements of the age and the greater attention that was being paid to the external design. The base of the building was started with a fine moulded plinth containing round the buttresses, which were pronounced, with a tendency to increased projection. After referring to the towers and spires with their graceful lines, he returned to the interior of the buildings and referred to the roofs, showing how the wood roof permitted much greater lightness in the general structure than stone vaulting where it was employed. After dealing with both these forms of covering for a church, the lecturer proceeded to speak of the various internal details, and showed many beautiful slides of these, and of the elaborate work in stone screens, sedilias, and other accessories. In conclusion, Mr. Mitchell-Withers suggested that the work of this period was worthy of study, whatever style of English architecture one might admire most, because its workers brought knowledge, science, and constructive skill into the work, besides ornamenting it with a mass of refined detail in which the skill of the workman had full scope. On the motion of Mr. C. M. Hadfield, seconded by Mr. T. R. Wigfall, and supported by the President, a vote of thanks was accorded the lecturer. The lecture was illustrated by lantern slides.

BRISTOL SOCIETY OF ARCHITECTS.—On Monday last, the 27th ult., Messrs. A. W. S. Cross, M.A., and George Hubbard, F.S.A., members of the Council of the Royal Institute of British Architects, visited Bristol and read papers before the local allied Society on "Registration." After the papers a full discussion ensued, and a resolution was proposed, seconded, and carried unanimously—"That this Society, having heard the respective papers of Professor Beresford Pite on one side and of Messrs. Cross and Hubbard on the other, is distinctly in favour of the principle of the statutory qualification and registration of architects."

LIVERPOOL ARCHITECTURAL SOCIETY.—The President and Council of this Society held a reception among members at the Law Library on Monday. There were present 150 members and friends, who were received by the President, Mr. P. C. Thicknesse, and Mrs. Thicknesse, and welcomed by many members of the Council. The drawings of the Cathedral (which were lent for the occasion by Mr. G. Gilbert Scott and Mr. Bodley) were on view. A lecture was then delivered in the Library of the Law Society by the Rev. T. W. M. Lund on "The Classical Architecture and Sculpture of Rome," illustrated by limelight views from photographs. Much of the lecture was devoted to some examples of sculpture in the Vatican and to the latest researches in the Forum.

COMPETITIONS.

NEW INFIRMARY, ALNWICK.—In this competition, which was confined to architects practising in Northumberland and Durham, the assessor, Mr. F. Caws, F.R.I.B.A., awarded the first premium of 100*l.* to Mr. Douglas (Alnwick) and Messrs. Boyd & Groves (Newcastle), as joint architects; the second premium of 30*l.* was divided between Mr. Stephen Piper and Messrs. Armstrong & Wright (all of Newcastle).

LIBRARIES FOR ISLINGTON.—The Public Libraries Committee of Islington Borough Council issued the following report on Wednesday:—"The President of the Royal Institute of British Architects, whom we appointed, with the Council's approval, architectural adviser and assessor on November 18, 1904, has selected, partly from his own knowledge and partly from a list forwarded to him by direction of the Committee, the ten architects whose

names are submitted as being specially qualified to prepare designs for the Central Library, and we have appointed them accordingly upon conditions as to competition which have been drawn up by the assessor, and which will, we trust, result in the erection of a building worthy alike of the donor and of the borough. Mr. R. Blomfield, Mr. W. Flockhart, Mr. H. T. Hare, Mr. M. E. Macartney, Mr. P. A. Robson, Mr. A. W. S. Cross, Mr. S. K. Greenslade, Mr. A. Keen, Professor Beresford Pite, and Mr. L. A. Stokes." The unsuccessful competitors, except those appointed architects for the branch libraries, are to receive an honorarium of 20*l.* each.

BOOKS RECEIVED.

STEAM-PIPES: THEIR DESIGN AND CONSTRUCTION. By W. H. Booth. (Archibald Constable & Co. 5*s.*)

GAS AND OIL ENGINES. By Walter C. Runciman. (Percival Marshall & Co. 6*d.*)

ESTIMATING FOR BUILDERS' WORK. Edited by Paul N. Hasluck. (Cassell & Co. 6*d.*)

MEASURING BUILDERS' WORK. Edited by Paul N. Hasluck. (Cassell & Co. 6*d.*)

ARCHITECTURE EAST AND WEST. By R. Phené Spiers, F.S.A., F.R.I.B.A. (B. T. Batsford. 12*s.* 6*d.*)

Correspondence.

SEWER VENTILATION AND INTERCEPTORS.

SIR,—I have been much interested in the controversy on the subject of sewer ventilation and interceptors which has appeared in your journal of late; more so because the ultimate issue is of such vital importance as to effect—if not directly, indirectly—the health of the community at large, and, as a custodian of such, I cannot refrain from expressing disapprobation at the unqualified statements made by Mr. E. Van Putten (Borough Engineer of Lewisham) upon the matter, which do not, so far, justify the attitude taken up by him. One need not hesitate to accuse him of being illogical, because his arguments have a tendency to condemn the principles he advocates, and, in order to disperse the misapprehension which must exist in the minds of many of your readers, I trust that Mr. Van Putten will not fail to elucidate in a later issue of your journal his statements in support of this "hashed up" idea of ventilating sewers by converting ventilating pipes of house drains into conduits for sewer gas at the expense of abolishing intercepting traps, a system contrary to the notions of all sanitarians, and which should be strenuously opposed. To abolish the intercepting trap—

"Twixt the noisome parish sewer
And the humble household ewer—"

would mean the undermining of the basis of sanitary progress, of which we boast in regard to the construction of house drains.

Do I understand that the problem of sewer ventilation has become so desperate in Lewisham, and so baffled human ingenuity, as to render it necessary to adopt as a last resource the system put forward by Mr. Van Putten? If so, one can have no doubt as to the result; it must spell failure, if his statement is correct that drain air is more foul than sewer air, because his difficulty will be intensified, instead of being modified, should the ventilators fail to act.

By the way, Mr. Van Putten does not say how he arrives at such a conclusion. Is it not generally accepted that there is a vast difference between "drain air" of a properly constructed drain and "sewer air" (gas)? I think so, inasmuch as drain air may be regarded as effluvia given off from adhesions of faecal matter to the interior of the drain pipe, and sewer air, as air mingled with sewer gas generated from deposits of foul matter in the sewer.

It may be clearly established that if the sewers of the town were constructed with adequate self-cleansing falls, with a sufficient number of manholes, efficient flushing arrangements, and free discharge for sewage at the outfall, there would be little need for sewer ventilation, as the sewer would be free from foul matter to create sewer gas. But unfortunately too many sluggish sewers exist, and unless they receive constant attention they become an intolerable nuisance, to say nothing of detriment to health. Although it is absolutely impossible, owing to the gaseous productions of decomposition, to prevent the formation of gas in sewers so constructed, the

nuisance and danger to the individual inhabitant may be mitigated by cutting off sewer gas from the dwelling-house. Thus the intercepting trap is an absolute necessity, more especially so in view of the fact that, in a vast number of instances, drains pass under the house; moreover, to abolish the intercepter would be running the "gamut to goosedom," as the health of thousands of people would be at the mercy of the "jerry builder," and "botch plumber," not only on account of bad drainage, but defective sanitary fittings and scamped plumber's work.

To return to the statements of Mr. Van Putten, he says that "it only remains to show that there would be no damage to the individual inhabitants by the omission of the intercepter from the house drains." He apparently evades the question with studied indifference, without giving an opinion, or attempting to prove that no danger is likely to accrue. As I have endeavoured to point out, there is an imminent danger, because it is difficult to disassociate house drains from sewers; thus it would be foolish to connect the drain ventilator with the sewer; defects may arise, and as sewer gas is poisonous, no question of the dilution of the poison by admixture with air can possibly come into consideration. The only sensible plan of treating noxious gas must be to destroy it locally where it is generated; if that cannot be done it should be dispersed at a high level above the house tops, by independent ventilating pipes.

I may say that during my holidays last year in the city of Hereford, I was interested in experiments which have been made there with Webb's patent street lamps, for extracting and consuming sewer gas, which appeared to give splendid results, and I was assured by my friend, Mr. Sydney Protheroe (the chief sanitary inspector), that wherever these lamps are fixed in the city, the nuisance caused by the emission of sewer gas has ceased in the vicinity.

I have one other point to refer to. Mr. Van Putten, in support of his contention, referred to certain experiments conducted by the Sanitary Institute in connexion with the flushing of house drains. His account is of a one-sided character. The fact is that experiments were made (as you are probably aware) with a view of ascertaining the quantity of water necessary for the efficient flushing of a water-closet. Mr. Van Putten mentions the results obtained only with a 2-gallon flush cistern, which answers his purpose; but, in his anxiety, he inadvertently omits to mention the results obtained with the 2½-gallons and 3-gallons flush, which have a contrary tendency to his quotation.

It is apparent that at present Mr. Van Putten has failed to support his contentions. FRANK WHITE, R.P.C., A.R.S.I., etc., Chief Inspector.

Public Health Office,
County Borough of Northampton.

SIR.—Referring to Mr. Watkins' letter in your last issue, I can quite believe that there is a great deal in what he says about the spread of typhoid fever in Lincoln being facilitated by the absence of sewer-gas interceptors in the drains of some of the houses.

For anyone who has constant experience of the unsatisfactory positions in which soil and drain ventilation pipes are allowed to terminate, and the imperfect jointing frequently discovered between water-closet traps and soil pipes, to say nothing of badly-constructed soil and ventilation pipes and other faulty details of house sanitation, it appears the height of folly to suggest that sewer-gas interceptors should be abolished, and the sewers allowed to ventilate through the house drains.

The only circumstances in which such a system might be permissible would be its universal application, combined with perfect drains and sanitary fittings in every house. A partial application under existing conditions must be, in my opinion, highly dangerous.

HENRY CARTER, A.M.Inst.C.E.

LEEDS INSTITUTE OF SCIENCE, ART, AND LITERATURE.—The students attending the classes in building construction, held at the Leeds Institute, spent a very interesting afternoon last Saturday, on a visit to the new building now being erected in South-parade, Leeds, for the Phoenix Fire Office. By the courtesy of the architect, Mr. W. H. Thorp, the whole of the building was thrown open for the students, who, under the guidance of their teacher, Mr. James Neill, made an instructive tour of the structure. These building construction classes are held on Monday, Wednesday, and Friday evenings throughout the session (from September to May), and number at present 176 students.

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE STEEL.—IX.

AN OMNIBUS REPAIR AND ACCUMULATOR DEPÔT. (Continued).

AN view of their satisfactory performance, some further particulars relative to the design of the floors in the building described last week may be of interest.

It is stated that M. Monmerque, the engineer who conducted the tests, was somewhat surprised by the records obtained, not so much because the floors successfully withstood the heavy loading, as for the reason that their behaviour with regard to flexure was not in accordance with his preconceived views. M. Monmerque was not prepared at first to accept the theory that either floor would behave as a single structure, and believed that the panels would act more or less as separate beams or slabs. Fig. 59 is a diagram representing the three panels of the 9'14-metre by 7'60-metre floor shown in Fig. 62, p. 214, and, concerning this, the suggestion of M. Monmerque was that the rectangles ABEH, HEKI, and IKML would act independently. In that case the diagram of bending moments for the span

AB (Fig. 59) would be approximately as shown in Fig. 61.

The designer of the floors, however, contended that this theory was wrong, and that the rectangle ABML (Fig. 59 or Fig. 60) must be considered in its entirety, arguing that the four surfaces HBEI, HKMI, AEHK, and IEKL in Fig. 60 would work together. As a matter of fact, this is what happened during the official test.

The manner in which the floor behaved will be more readily appreciated by reference to Fig. 62, where PR is the horizontal, below which, and parallel with it, is a line at the distance t , and above it two other parallel lines, one at the distance r and the other at the distance s , the latter being situated at twice the height of r above the horizontal line PR. At the full load of 3,500 kilogrammes per square metre, the point a , at the left-hand support, rested upon the line PR (see Fig. 62, and also refer to Fig. 60 for the position of the point c on the floor surface). The point b rose above the horizontal, at the distance r ; the point c descended below the horizontal to the distance t ; the point d rose above the horizontal to the distance s ($=2r$); the point e descended below the horizontal to t ; the point f rose to r ; and the point g , at the right-hand support, remained upon the line PR. Hence, instead of being deflected under the

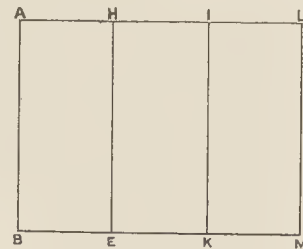


FIG. 59.

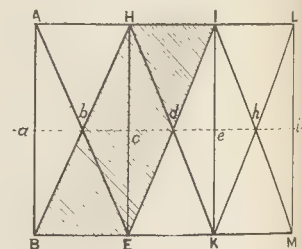


FIG. 60.

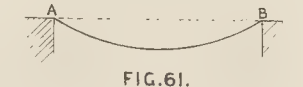


FIG. 61.

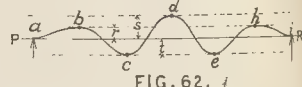


FIG. 62.

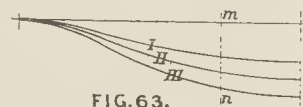


FIG. 63.

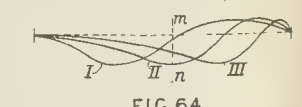


FIG. 64.

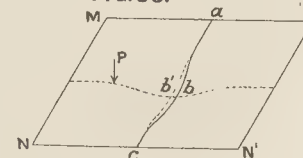


FIG. 65.

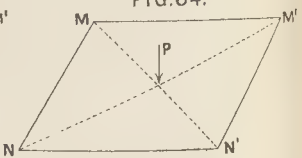


FIG. 66.



FIG. 67.

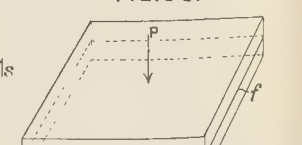


FIG. 68.

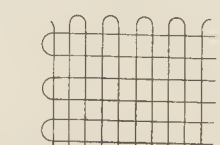


FIG. 69.

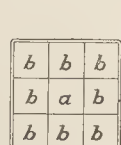


FIG. 70.

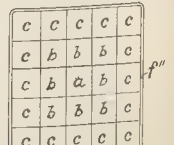


FIG. 71.

Illustrations to Student's Column.

load, b and h were raised, and d was raised to a height double that of b and h above the horizontal. This result seems quite reasonable, for, e and f in the members HE and IK (Fig. 68) having dropped, it follows in accordance with the laws of equilibrium that b and d and h must rise. Further, as d is raised and h and b respectively, d is raised to twice the height to which h and b are raised.

Analogous action is observable in connexion with the construction of lock and dock gates, which, whether made of timber or of steel, consist of plane vertical surfaces, stiffened by bracing, consisting of projecting ribs, and are proportioned in accordance with the rule that the maximum pressure occurs at one-third of the height, such gates being made in pairs, meeting at the middle of the opening to be closed. It has been found that when the bracing possesses a certain resistance, this resistance causes variation of the bending moments between the point of maximum thrust and the top of the gate, although the maximum thrust is always exercised at the same point. This view is illustrated by the case of a bridge girder, where the maximum bending moment is not necessarily to be found at the point of maximum load. It follows that the resistance of the horizontal stiffening ribs can be ascertained with reference to the vertical plates or planks of a gate, so that the maximum effort at any point whatever shall always produce a maximum bending moment at the upper part of the gate and on the centre line between the vertical walls of the gateway. It is evident that under a static load the character of the bending moment is not changed and the most favourable conditions of resistance are thereby ensured, because the various parts of the structure are not alternately in tension and compression, as in the case of a bridge subject to rolling loads.

If the maximum bending moment of a dock gate occurred normally at one-third of the height, it would be displaced with the increase of pressure, giving rise to conditions similar to those graphically represented in Fig. 64. Upon the section mn in this diagram there is compression on I and tension in II and III, whereas in the case represented by Fig. 63 the maximum bending moment is at B, and the points of the curves I, II, and III in the section mn are always in tension.

In the floor system now under consideration the stiffening ribs—corresponding with the bracing of a dock gate—are proportioned to the resistance with reference to the floor slab—corresponding to the planking or steel plates of the dock gate—so that the bending moment is always maximum at a point such as b , at the centre of ac , in the surface $MNcba$ (Fig. 65). But we may take a surface $M'N'c'ba$, intimately connected with the surface $MNcba$, and arranged so that the surface $M'N'c'ba$ shall be able to transmit the maximum bending moment at b at the centre of abc . Then a force P , acting in a downward direction at the centre of the surface $M'N'c'ba$ will not be able to depress the line ac , as shown by the line abc , and the line ac' will follow the modified direction $a'b'c'$, because the surface $M'N'c'ba$ offers resistance to the sinking of the point b in the surface $MNcba$.

The same line of reasoning can be extended to the ribs MN' , $N'M'$ (Fig. 66), when once the surface has been formed so that the downward force acting along a line as rs (Fig. 67), and when acting at any point whatever upon that line, shall still leave the maximum bending moment at the centre. Thus, we have rs for the curve of bending moments with the force P at P' , and with the force at P' , rs' with the force at P'' , and rs'' with the force at P'' . Further, in a floor panel braced by means of stiffening ribs passing from one corner to another (as shown in Fig. 66), any downward force P acting upon any point whatever of the surface $M'N'c'ba$ will always cause the maximum bending moment due to that force to occur at the point of intersection of the ribs MN' and $N'M'$.

Hence, it will be seen that the critical points in the floor illustrated in Fig. 60 are b , d , and A , and, as shown in Fig. 62, these points are not depressed as would be the case if the three panels ABHE, HEKL, and IKML were to act separately.

In the case of a floor which, in addition to being provided with stiffening ribs, is reinforced throughout with steel, not only in the form of bars in the ribs, but also constituting a reticulated network—such as that represented in

Fig. 69—in the substance of the covering slab, the resistance is far greater than in any floor of ordinary construction, in regard both to flexure and to failure by tension or compression.

Moreover, the effect of the vertical force, applied at any part of the surface, is to cause lateral expansion, resulting in pressure of the mortar or concrete against the strands of steel constituting the reinforcing network. In Fig. 68, a represents a prism of mortar or concrete in a floor slab reinforced by a network of steel bars, P the applied force, and f the reinforcement surrounding the prism. The effect of binding the prism is similar to, but far less in degree than, that due to the hooping of concrete in column construction as recommended by M. Considère (see the *Builder*, vol. lxxxv, p. 584).

In addition to the restraining influence of the steel rods, the prism a is further reinforced by being imprisoned, as shown in Fig. 70, in the middle of a series of eight similar prisms, lettered b , each of these being surrounded by a mesh of the network, and the whole series by the hooping f , whose resistance against lateral bulging is increased by connexion with the strands of the network passing between the prisms a and b in directions perpendicular to every side of the group. Thus the prism a experiences from the eight prisms b a reaction equal to the action producing lateral expansion, less a diminution proportionate to the elastic deformation of the prism a . If the prism a were not reinforced laterally in the manner described, it might fail under the force P , whereas, being treated in the manner shown, action is neutralised by reaction, with the result that the prism has merely to withstand stress equal to the difference between the action and the reaction. This difference being equal in value to the elastic deformation of the material, it follows that a great accession of strength must result.

Still further, it must be remembered that this small proportion of the original force P is distributed among the surrounding eight prisms b , and in turn the group of nine prisms represented in Fig. 70, when surrounded by other prisms c , as in Fig. 71, can only transmit to each of the sixteen prisms c a force equivalent to $\frac{1}{16}$ th of the elastic deformation of the prism a . It will be observed that the twenty-five prisms in Fig. 71 are hooped by the band f' , which is tied laterally by the network, as previously explained. Consequently, the force transmitted to an outer series of prisms is $\frac{1}{25}$ th of that on a ; upon the next outer series the transmitted force becomes $\frac{1}{25 \times 25}$ th; upon the next series the force is $\frac{1}{100 \times 25}$ th; upon the next series it is $\frac{1}{2500 \times 25}$ th; upon the next series it is $\frac{1}{62500 \times 25}$ th; upon the next series it is $\frac{1}{1562500 \times 25}$ th; and upon the series it is $\frac{1}{39062500 \times 25}$ th.

That is to say, at the distance of ten meshes away from the prism a the force is so distributed that it is only about $\frac{1}{39062500}$ th of the intensity evidenced at the prism a . Of course, only a single downward force P is considered, while in the case of a floor under uniformly distributed load there would be the equivalent of a force P on every prism into which the floor is subdivided by the meshes of the reinforcement. If the dimensions of the floor were represented by a length equal to $a + 10$ prisms on each of two parallel sides of a , and a width equal to $a + 10$ prisms on each of the two other parallel sides of a , the total force would be represented by $P \times 441$, but this multiplication of the force does not in any way affect the beneficial influence of the system of reinforcement described.

Tests conducted at L'Ecole des Ponts et Chaussées and elsewhere have demonstrated the fact that floors constructed in the manner here described, behave as if their outer edges were securely fixed, while at the same time they are merely supported in the ordinary way. The tests conducted at the dépôt in the Rue de Lagny appear to show that the different parts of a floor system may be designed so as to balance one another, in accordance with the principles adopted in the construction of arches, domes, and other structures. In such a floor one portion which is depressed under load raises another portion, and, in order to provide against excessive deformation of the surfaces, suitably proportioned stiffening ribs may be employed, so that very heavy loads and considerable spans may be adopted with perfect safety. The dépôt of the Compagnie Generale

des Omnibus certainly gives striking proof of the capacity possessed by reinforced construction of brick and concrete for complying with the most difficult conditions.

THE RECK SYSTEM OF HEATING BY HOT WATER.

REFERENCE was made in a report in our columns, in November last, to the Reck system of heating by hot water, of which Messrs. James Boyd & Son are the agents in this country. We wrote to them for further particulars, and they have now sent us the accompanying diagram and the following description, which of course must be taken as their statement, not as ours; but we are disposed to think that the claims made for the system will be found to be borne out in practice.

The Reck circular system of hot-water heating is the invention of Capt. A. B. Reck, of Copenhagen. It is a low-pressure hot-water system, the special feature of which is that all heat is transferred to the water by low-pressure steam in such a manner that the water may be heated to the boiling point in the flow pipes without danger of boiling over from the expansion tank, and, at the same time, the velocity of the water is about four times as great as in an ordinary hot-water apparatus. How this is attained will best be understood by looking at the accompanying diagram of the system.

Steam is here shown taken from a low-pressure steam boiler (E) fitted with an automatic damper regulator, by means of which the pressure may be maintained at any desired point between ordinary atmospheric pressure and about 5 lb. additional. This boiler may be of any type so long as it is capable of generating steam; or, in buildings where high-pressure steam is available, the boiler may be dispensed with, and a reducing valve used to give the required low pressure.

The steam is first taken into the reheater (D), where it heats through metallic surfaces the circulating water coming from the return main (K) and passing through the reheater into the main rising hot-water pipes (L). The metallic surfaces in the reheater are generally made large enough to heat the water in (L) to a temperature of about 185 deg. Fahr., but the admission of steam can be regulated automatically, or by hand, to give any lower temperature.

The pipe (L) ends in the expansion tank (A), but before it reaches this point there are inserted in it two special appliances required by the system—the condenser (C), and the circulator (B), to be described later. These two appliances, however, do not impede the flow of the water through (L) from the reheater to the expansion tank, so if the tank and the reheater are connected by a system of hot-water piping and radiators, through which the water gives out its heat to the building, it will be possible to work such an apparatus at any temperature below 185 deg. Fahr., the reheater replacing the ordinary hot-water boiler in every respect.

In the diagram the main flow pipe (J) of the hot-water apparatus is shown placed in the attic of the building, and the radiators (F) are shown connected to the vertical risers on the one-pipe plan. This is shown only because the one-pipe system is in common use for hot-water heating; any other arrangement of pipes may be used, according to the requirements of the building.

From the steam space of the reheater a steam pipe (G) rises to the attic, where, in the circulator (B), it ends in a noiseless mixing apparatus for mixing the steam with the water rising through (L). As the circulator is always placed a certain distance below the water-level in the expansion tank, it follows that no steam will enter the circulator as long as its pressure, controlled by the regulator at the boiler, does not exceed the water-pressure in the circulator. Thus it will be seen that a simple movement of the weight on the regulator in the basement gives the attendant means for almost instantly putting the circulator in or out of action, as circumstances may require.

Now, if the steam is allowed to have sufficient pressure to penetrate into the circulator and to mix itself with the water there, the result will be that this water, rising up to the expansion tank, will have a very strong admixture of steam bubbles, making the specific gravity of this part of the water column in the rising pipe less than half the specific gravity of a column of water at boiling point without the admixture of steam. The increased velocity in the hot-water heating apparatus, as soon as steam enters the circulator, is due to this great diminution in specific gravity of the upper part of the column of rising water.

When the water reaches the expansion tank

the steam contained in the bubbles will be discharged from the surface of the water, so that when descending through the hot-water main pipe (J) the water will be once more perfectly free from steam.

The steam discharged from the surface of the water in the expansion tank will reach the condenser (C) through the overflow pipe (H), where it will be reduced to water and returned through a special return pipe (R) to the boiler. The condenser consists of a steam jacket or a series of tubes inserted on the main rising pipe (L). Its condensing surface is sufficient to deal with the steam discharged from the expansion tank, the volume of this steam always being in a certain proportion to the weight of water passing through the hot-water system. To give an outlet for what air is contained in the upper part of the tank, in the overflow pipe, and in the condenser, before steam penetrates the circulator, an automatic air-valve is fixed on the condenser.

The possibility of raising the temperature of the water in the flow mains of a low-pressure hot-water apparatus to the boiling point gives a considerable saving in heating surface without danger of overboiling, and at the same time the increased velocity of the water allows of carrying the heat to very great distances from the boiler and of using pipes of only one-fourth the sectional area required by ordinary low-pressure hot-water heating.

The Reck system is simple to work, as it is self-controlling. It cannot overheat the

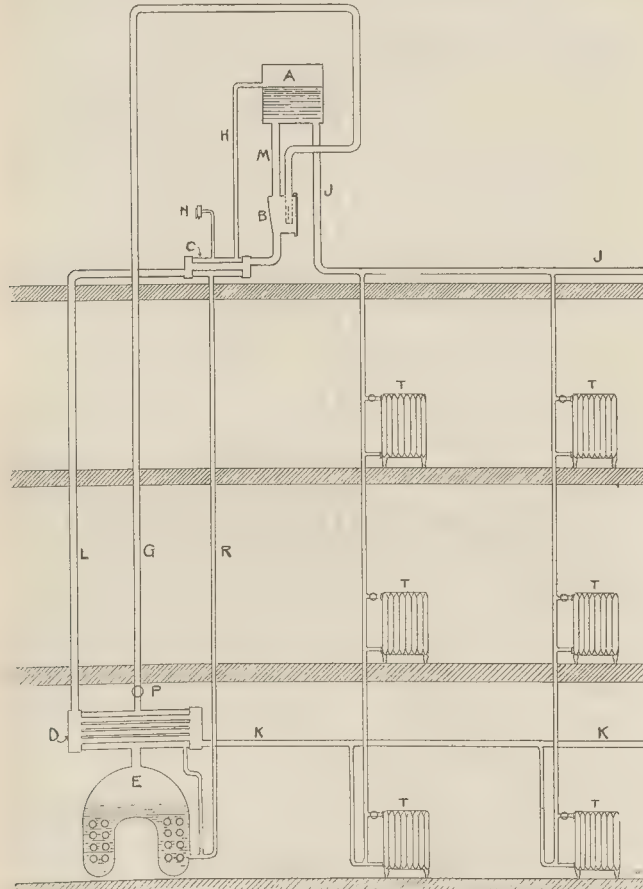
water, and it regulates the combustion in the boiler automatically, so that no waste of fuel can occur. The whole system is so simple that the management of the apparatus may quite safely be left to unskilled servants.

It is an economical system to work, because it is capable of raising and lowering the heat in a very short time, and can therefore easily adapt itself to the changes of the weather. Containing a smaller body of water, it naturally requires a smaller quantity of fuel to raise the heat and to maintain it than does an ordinary hot-water system.

As all the water produced by the condensation of the steam finds its way back to the boiler, the water line will remain constant without any special feeding apparatus.

The strong circulation produced by the Reck circulator allows the apparatus to be fitted up almost regardless of levels. It is as effective in its work when all the heating surface is on the same level as the boiler, or even lower, as when it is on some higher level. It does away with the necessity for sunk heating chambers—the boiler need not be the lowest part of the system. It makes a heating apparatus more sightly, because it uses smaller pipes. It conveys the heat further and into difficult places.

In conclusion, the Reck system makes it easy to solve problems in heating which have hitherto been considered most difficult, because the effect of the circulator on the motion of the water is practically independent of the levels of the radiating surfaces in relation to the level of the boiler.



Sectional Diagram Illustrating the Reck System of Hot-water Heating.

A—Expansion tank.
B—Circulator.
C—Condenser.
D—Re-heater.
E—Boiler.

G—Steam pipe to circulator.
H—Overflow pipe.
J—Main hot-water flow pipe.
K—Main hot-water return pipe.
L—Main hot-water pipe from re-heater to circulator.

M—Motor pipe.
N—Automatic air-valve.
P—Valve on steam pipe.
R—Condensation pipe.
T—Radiators.

WESTMINSTER CITY COUNCIL.

The usual fortnightly meeting of this Council was held on Thursday last week at the City Hall, Charing Cross-road, S.W.

Loan.—On the recommendation of the Finance Committee it was agreed to apply to the London County Council for an advance of 14,961*l.* for the purpose of certain street improvements and sewer works.

Paving of Streets round Kingsway.—The Works Committee recommended, and it was agreed, that the proposal of the London County Council to pave with asphalt the street east of Kingsway leading from the south side of Lincoln's-inn-fields be approved.

Paving Estimates.—The Works Committee submitted a further report on the annual estimates for paving works, and recommended that the sum of 32,992*l.* be approved. This was agreed to.

London Building Act Amendment Bill.—A letter was received from the Kensington Borough Council enclosing copies of the resolutions passed at the recent conference of local authorities. It was resolved to inform the Borough Council of the steps already taken by the City Council to oppose the Bill.

RURAL HOUSING QUESTION AND THE BY-LAWS.

MR. WALTER LONG, President of the Local Government Board, received a deputation on the 23rd ult., organised by the Workmen's National Housing Council on the subject of rural by-laws. The deputation was introduced by Mr. Robert Williams. It was urged that the enforcement of the existing by-laws was absolutely necessary, and that any modifications with regard to materials and provisions for health, safety, and stability must be safeguarded.

Mr. Robert Williams said that they desired to dissociate themselves entirely from those who desired by-laws and their administration. Acknowledging, as they did, the great need of more and better houses, they desired to do their utmost to further any efforts that were being made to supply the want; but, at the same time, they would not be a party to ill-built, cramped houses, constructed of flimsy materials, on the score of cheapness and regardless of sanitary regulations. It was said that the labourer could not pay more than 8*l.* a year; therefore his house must be reduced in cost, so that the 8*l.* rent should give a fair return on the capital laid out. If the labourer were paid 12*l.* more a year he would be able to pay 12*l.* rent. It seemed to them that that was pre-eminently an agitation to keep wages down to their present low level.

Mr. Walter Crane said he thought it was perfectly possible to conform to every health regulation and to build in accordance with the Local Government Board regulations cottages that would not disfigure the face of the country.

Mr. Lambert and Mr. Gwynne having also spoken.

Mr. Long, in reply, said that, though the deputation was very interesting, it was well unnecessary. The general principles which he had advocated had always been advocated and maintained by the Local Government Board. So long as the by-laws ensured that cottages should be well built, should be sanitary, and suitable for human habitation, he did not think that anyone had a right to complain. Of the 700 local authorities in England, only 266 had adopted even the present modest by-laws, and the local Government Board would undertake a difficult enterprise if it would make the by-laws stricter and then insist on their adoption. His object in any suggestions he would make would be to adapt the by-laws to the requirements of the districts so that they should be adopted by a larger number of local authorities. The real difficulty was to frame by-laws which should be applicable to areas partly urban and partly rural, and he was considering the question of introducing an intermediate code to meet such cases. Bad cottages in the country were often attributed to the neglect of the landowners, and that the bad cottages belonged to small speculators who lived at a distance, and probably never saw the buildings. There was no doubt that the cottages in many places were altogether unsuitable and inadequate, and the Board would do everything possible to remedy this state of things. There was room for great improvement in the part of local authorities, and the members of the deputation might do useful work by bringing pressure to bear on their representatives on the local bodies to secure a better discharge of their duties.

OBITUARY.

MR. JACKSON.—Mr. John Chappell Jackson, of Wimbledon, and Town Hall-chambers, Borough, S.E., has succumbed to injuries he received by a fall from his bicycle a few days ago. Mr. Jackson was born in 1872, and was a pupil of Mr. Augustus E. Hughes, of Mortimer-street, W. He was employed as architect for the rebuilding or enlargement of many large licensed houses in various parts of London, amongst them being the Black Dog, in Vauxhall-walk, the Bull's Head, in Ben Jonson-hall-walk, the Fishmongers' Arms, Wood-green, for Messrs. Watney, Coombe, Reid, & Co.

MR. MORRISON.—The death, on February 11, is announced of Mr. Gabriel James Morrison, aged 65 years, who, as a pupil, M.Inst.C.E., Lord Kelvin for the laying of the first cable across the Atlantic. We read in the *Times* that, after having been employed as engineer in charge of the since dismantled railway from Shanghai to Wusung, he established himself in practice as a civil engineer at Shanghai, where he played a prominent part in public affairs as member of the Municipal Council and commanding officer of the Volunteer Corps. In 1885 he entered into partnership with Mr. F. M. Gratton, and the firm of Morrison & Gratton carried out many important engineering and architectural works in Shanghai. After the dissolution of partnership in Shanghai, Mr. Morrison came to London, three years ago, Mr. Morrison came to London, and was appointed consulting engineer for the Shanghai-Nanking railway, in association with Sir John Wolfe Barry and Mr. Arthur J. Barry.

MR. WILSON.—The death is also announced of Mr. George William Wilson, M.Inst.C.E., Mr. Wilson, who died in his 35th year, was Lecturer in Civil Engineering at Leeds University, and had previously been Demonstrator in Engineering at Owens College.

MR. GEORGE E. LOWRY.—We have to announce the death of Mr. George Edward Lowry, of the firm of Messrs. J. W. Lowry, builders and contractors, of Corporation-street, Newcastle, and resident at St. George's-terrace, Jesmond. Mr. Lowry, who was 40 years of age, was a native of Newcastle, and for a very long period he had been connected with the firm, who have carried out some extensive contracts. The most important of late were the erection of the Laing Art Gallery, the rebuilding of the Exchange Hotel, Grey-street, and the Sun Insurance Offices in Collingwood-street, Newcastle. He was well known amongst builders, architects, and contractors of the North of England and other parts of the country. He leaves a widow and one child.

GENERAL BUILDING NEWS.

CHURCH, FIVALE, SHEFFIELD.—The nave of the new Church of St. Cuthbert's, at Fivale, Sheffield, has just been dedicated by the Bishop of Sheffield. The church is built to accommodate 750 people, and is in the Early English style. Provision has been made for a tower and spire to be raised at the north-west angle. Mr. J. D. Webster was the architect, and Mr. Longden the contractor.

CHAPEL CHURCH, ASHINGTON, NORTHUMBRIA.—The corner stone of the Catholic church has just been blessed by the Right Rev. Abbot of St. Edmundsbury. The new church, which is situated on the main thoroughfare at the corner of Station-road and Park-road, will be a brick building with Gothic windows and chancel. The nave will be about 78 ft. in length and 32 ft. in width, the ceiling being computed to seat fully 500 worshippers. It will be provided with a side chapel and a baptistry. A cloister, 12 ft. wide and 33 ft. long, will connect the church with the presbytery. The architect is Mr. Charles Walker, of Newcastle, the building contractors being Messrs. R. & G. Brown, of Amble. The estimated cost of the undertaking is £2500.

BOLESLAU CHURCH, NEAR SHEFFIELD.—Mr. Temple Moore, of Hampstead, has prepared plans for the proposed enlargement of Boleslau Church. The proposed alterations consist of the addition of a large transept and choir, with aisles, to the east of the present building, the existing small transept, recess, and east wall of which are to be taken down, and the galleries in the present nave removed. The whole of the seating of the existing part of the church will be renewed, and the organ is to be moved from its present position to a gallery at the north end of the new transept. The style of the new work is to be Early English, local stone being used for the walls, and the new timber roofs to be covered with Westmorland slates.

WESLEYAN CHURCH, CORK.—The opening of a new Wesleyan church, which has been erected at Cork, took place recently. The building has been erected at a cost of 1,450. Accommodation is provided for about 250. The

architects were Messrs. Sames & Henshaw. Mr. A. Blain was the contractor for the work, with the following sub-contractors:—Mr. R. Hutton, joinery; Mr. Harrison, Ulverston, plumbing and painting; Mr. J. Chippendale, Grange, plastering and slating.

PARISH ROOM AND VESTRY, IPSWICH.—On the 23rd ult., the new parish room and vestry which have been added to St. Peter's Church, Ipswich, were opened. The vestry consists of a room 23 ft. wide and 25 ft. long, with lavatory accommodation adjoining at one end. The new building is built of red brick, and faced, where seen, with flint and stone dressings; the floor is laid with pitch-pine blocks. The builders were Messrs. E. Catchpole & Sons, the architects being Messrs. Brown & Burgess.

ALTERATIONS TO THE TOWN HALL, FOLKESTONE.

The improvements which are being made to the Folkestone Town Hall are now nearly completed. On entering the main entrance on the left, what was the police court has been curtailed in length and converted into a committee-room, that which used to be on the right having been transformed into other rooms, the office of the Chief Constable occupying the corner, next to it being the Town Sergeant's office, and in rear of it a lavatory. The main staircase of stone (to the large hall) has been transferred to a position behind the committee-room, and it debouches on to a landing formed of a space cut off from the old assembly-room. On the right at the top is the enlarged council chamber, which comprises the former chamber with the space formerly occupied by the top of the staircase. The floor was found, on examination, to be weak, and a new one was constructed. The seating accommodation is augmented by the extension of the balcony, and also by the construction of a gallery at the rear, which covers the space formerly filled with lumber. The gallery is approached by a separate staircase, as is also the balcony, the entrance to the stairway to the latter being from the landing outside the main hall and the council chamber. The police court is a new apartment. At the back of the police court are two cells for prisoners, and on the same floor are magistrates' retiring-room, two consulting-rooms, lavatory, etc. The main door of the police court faces the main door of the building. The police station and offices are situated in the basement, the principal apartment being the police muster-room. There are five cells for prisoners, all built on the same principle as the two above, and lined with brown enamelled bricks. All the principal apartments are floored with wood blocks. The whole building will be warmed by means of a low-pressure system of hot-water apparatus, and radiators are placed in the halls and corridors. Electric light is provided throughout the building. The large hall and gallery, the council chamber, the police court, and cells are ventilated by means of exhaust fans driven by electricity. The wood-block floors have been put in by Messrs. Jeffrey & Son, of London; the mosaic flooring in the entrance by Messrs. Diespeker & Co., of London; the heating and ventilating appliances by Messrs. Jones & Son, London; the electric light installation and fittings by Messrs. G. Smith & Co., Folkestone; and the fireproof floors by Messrs. Banks & Co., of London. The general contractor for the work was Mr. G. Parsons, the architect being Mr. Reginald Pope. Mr. Lepper was the clerk of the works.

TOWN DEPT., LONDON.—The new depot at Ilford was opened a short time ago. The buildings have a frontage to Ley-street of about 350 ft., with a building-line set back 15 ft., and are enclosed by a dwarf wall and ornamental wrought-iron fence in panels. The main entrance is from Ley-street, and is about 30 ft. wide, situate between the cottages and the office block. A weighbridge, by Messrs. Pooley & Son, to weigh up to 10 tons, is placed in this entrance, adjoining which is a weigh office and general clerks' office. Leading out from this office, with an entrance from and overlooking the yard, is the foremen's office. In continuation of this block are separate stores for tools, oils, etc. An open shed separates these buildings from the stable block, having a parapet wall to isolate the stables in case of fire. The stable block consists of a fine range of stalls for twenty-four horses, the central portion of which is occupied by two loose boxes, and harness-room, with hay and corn store over, having a fireproof floor, and surmounted by a tiling of iron. Facing Ley-street, but separated from the depot itself, is a pair of cottages arranged for the use of employees. At the rear of the site, and to the left, are situate the workshops and stores. At the back of this building is an open tar macadam store. The central block comprises a roller-house, with space for two steam rollers, and men's messroom, with cooking range, tables, and seats. Adjacent to

this room is a lavatory. The block of buildings to the right of the last comprises an open cart-shed for carts, with two storehouses over, carried at the front on steel stanchions and girders, and having a fireproof floor. Access to these stores is obtained by means of an exterior staircase. Supported upon steel girders and an arched concrete floor above the stores is a cast-iron water tank capable of holding some 40,000 gallons. The premises are electrically lighted throughout. The buildings, on Ley-street frontage, are faced with red bricks, with stone dressings, terra-cotta, etc., whilst at the rear they are faced in stock bricks with blue brick quoins, the whole of the roofs being slated. The cost of the buildings, exclusive of site and all fittings, is about 10,000, the contractors for the work being Messrs. P. & A. Willmott, of Ilford, the clerk of works being Mr. Samuel Streeter. Mr. H. Shaw, surveyor, prepared the plans.

REBUILDING IN HIGH-STREET, KENSINGTON.—The old shops, houses, and back streets on the north side of the high road, for a length of about 200 yds. eastwards from Church-street, have been pulled down for a widening of the roadway from 43 ft. to 60 ft. On a portion of the cleared ground a block of buildings is being erected for Messrs. Barker, after plans and designs by Mr. P. E. Pilditch, the architect of several premises built for that firm in the immediate vicinity. The new buildings, constructed of red brick, with Portland stone dressings, have a frontage of 80 ft. to the High-street, with a return of about 160 ft. in the side street formed by the widening of Brown's-buildings; the block contains seven stories high, contains shops and showrooms on the ground and first floors, and suites of residential flats on the floors above. New shops are being erected on the Church-street side, of the same materials and after a similar elevation; a fire brigade station is at the end of the new side street; and eastwards, near the gates of Palace-gardens, is a large space which has been acquired by the Crown.

ST. HILDA'S CHURCH, WEST JESMOND.—St. Hilda's Church, West Jesmond, has just been consecrated. The new church is Early XVth century in style, and is built of stone from the Brunton Quarries. The roofs are covered with Westmorland green slates, and are constructed of pitch-pine. The main roof over the nave and chancel runs at the same level from east to west. At the junction of nave and chancel there is an octagonal turret, with spire covered with oak shingles. The bell is hung in a stone turret adjoining the Sunday school. The aisle roof is of the open timber description. The chancel pavement and that to entrance porch is of black and white vitreous glass mosaic. The chancel stalls are of oak, also the pulpit, Litany desk, altar table, and credence. The font is of Caen stone, and the lectern of brass. The plan of the church consists of nave, chancel, north aisle, vestries, and organ chamber. The south aisle has yet to be built, and when completed the church will seat 500 adults. The heating is by hot water on the low-pressure system. The lighting will be by electricity. The following firms have been employed on the building:—Mr. F. J. Hepple, builder; Messrs. Emley & Sons, heating engineers; Messrs. Falconer, Cross, & Co., electrical engineers; Messrs. Rusts Vitreous Mosaic Company, for pavements; the North of England School Furnishing Company, for chancel stalls; Messrs. Brown & Hughes, for pulpit and Litany desk. Messrs. Hicks & Charlewood are the architects. The cost of the present church is over 4,000.

SANITARY AND ENGINEERING NEWS.

SEWAGE OF DITCHLING.—The Chailay Rural District Council have received sanction from the Local Government Board to a loan of £2500 for the sewerage and sewage disposal of the parish of Ditchling, and the engineers, Messrs. Beesley, Son, & Nichols, have been instructed to prepare the necessary plans and specifications to enable the Council to invite tenders for the construction of the works.

THE VENTILATION OF SEWERS.—Mr. Dudfield, the Medical Officer of Health for the Borough of Kensington, in his monthly report, says in relation to the subject of foul air from sewers:—"Attempts have been made at sundry times to provide a chemical remedy for the nuisance. One such—successful as a laboratory experiment—was tried in Kensington some thirty-six years ago. Others have formed the subjects of patents; not one of which has come into general use, a fairly sure indication of their practical inutility. The late Metropolitan Board of Works and the County Council alike, expended vast sums on disinfectants with the same object, to little purpose. My own view has always been, that abatement of nuisance from this cause, should be sought by means for admitting to the sewers copious streams of atmospheric air."

REGISTRATION OF PLUMBERS.—The Corporation of Grimsby is to be congratulated on having taken a forward step in the sanitary administration of the Borough by requiring that the plumbers employed upon Corporation work shall possess the Registered Plumber's Certificate. This decision follows logically and usefully upon the establishment of the National Registration of Plumbers by the Plumbers' Company in the chief centres of population. The late Mr. George Godwin was one of the most prominent of those who induced and assisted the Company to organise the registration system. Reference to the *Builder* of the period affords evidence of the soundness of their views, which have since been generally adopted.

MANCHESTER SHIP CANAL. The Engineer's report as to works states that the depth of water in the canal and docks has been fully maintained throughout the entire length of the waterway by means of the dredging operations. The embankments and locks of the canal are generally in good condition, and the works throughout have been efficiently maintained. At Partington Coal Basin two additional hoists, with the necessary railway approaches thereto, are in course of construction. A new power station for the supply of hydraulic power to these hoists is also in process of construction. The leading jetty at the upper end of the 65-ft. lock at Irlam is well advanced towards completion. A cattle stage with approaches has been constructed on the northerly side of the canal at Barton, and is in use. The erection of the coaling crane at the new berth at Weaste has been completed, and the crane is in use. Additional railway sidings at Barton, Weaste, and Trafford Wharf have been completed, and are in use. The leading jetty on the southerly side of the 65-ft. lock at Mode Wheel is in course of construction, and is nearly complete. The works in connexion with the new dock on the site of the old racecourse, and with the transit sheds on the southerly side thereof, which are being carried out by Mr. Henry Lovatt, and others, under contracts with the Manchester Dock and Warehouse Extension Company, are approaching completion. The removal of the length of the dock wall, which has formed the dam between the existing docks and the new dock, is in progress. A locomotive shed to the southward, and an electric switch-house to the eastward of No. 9 Dock, are in course of erection. The works required for the deepening of the length of the canal between Latchford Locks and Irlam Locks are in progress. The construction of works required in order to permit of the raising of the level of the water in the estuary section of the canal is being put in hand.

FOREIGN.

FRANCE.—M. Lenoir, the sculptor of the monuments to Berlioz and César Franck, has been commissioned by the Government to carry out a monument to Proudhon, the painter, which is to be erected in the Jardin de l'Infante at the Louvre.—The French Society of Water-colour Painters has opened its exhibition at the Georges Petit Gallery. Among the best works are those of MM. Guillaume, Scott, Latouche, Calbet, and Zuber.—M. Bessard and M. Alfred Boucher have been elected members of the Conseil Supérieur de l'Enseignement des Beaux-Arts.—The Municipality of Auch have voted a sum of a million francs for architectural and street improvements.—The Municipality of Brest has under consideration the building of a school for young naval officers.—The jury in the competition for a new Savings Bank for M. Jean Millot; but the carrying out of the building is given to M. Gillet.—M. Billon has been elected President for 1905 of the Union Architecturale de Lyons.—The Municipality of Grasse has voted a sum of 1,200,000 francs to improvements in the sanitation of the town.—The death is announced at the age of 67, of M. José Ramon Llopias, architect. He was a native of Valencia, and studied in the Atelier Guépin and at the Ecole des Beaux-Arts. He was successively employed, in 1864, at the works of the Exhibition, then at those of the Vaudeville Theatre, and finally at the Trocadero. He was architect of many private buildings. He was a member, since 1871, of the Société Centrale des Architectes.

GERMANY.—In the competition for designs for a bank at Darmstadt, the first premium (2,000 marks) was awarded to Herr Paul Meissner, and the second (2,500 marks) was divided between Herr Klass v. Mack and Herr Vetterlein.—An exhibition, entitled "Art in the Country Districts," is being held at the Art Museum in Berlin.—The building in con-

nexion with the Technical School at Berlin, designed by Dr. Thier, and built at a cost of 120,000 marks, is now being used for an exhibition of "German Chemical Industry."—The Market Hall at Cologne, built by Herr Schilling, and which is now in use, cost 6 million marks.—The gymnasium and girls' school, built from the designs of Herr Heideck, at Lübeck, are completed.—The Church of the Holy Ghost at Berlin will be preserved, but it is to be connected with the new commercial schools, and the interior is to be used as a Lecture Hall.—An Exhibition of Japanese Decorative Art is to be held in the Art Museum of Berlin; the collection is chiefly the property of Herr Gustav Jacoby.—The Church of St. Michaels at Hildesheim, which dates from the XIII century, is to be restored.

AUSTRIA.—A monument to the Emperor Josef is to be unveiled in August at Dux; the monument is to stand at the entrance of the Park, and is being executed by Professor Theodor.—The building of the Landstrasse Theatre in Vienna has been entrusted to the architects, Franz Freiherr von Kraus and Herr Josef Tolk.

SWITZERLAND.—Some interesting frescoes have been discovered on the walls of the church at Goldbach, which, according to Professor Künster, date from the IXth and Xth centuries.—A new secondary boys' school is to be built at Bern, for which the Town Council has voted 930,000 francs. The death is announced of Herr Franz Allemann, civil engineer, at Bern, on February 3, in his 67th year.—A concert hall is being built at St. Gallen from plans by Herr J. Kunkler; the hall is to be completed by the end of the summer.—The church at Würenlingen is to be restored under the direction of Herr Betschon.—New Government buildings are to be erected at Bern at a cost of 600,000 francs.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—Mr. Alfred Griffin has arranged a partnership, as from the 27th ult., with Mr. Benjamin Woollard, F.R.I.B.A., who has hitherto practised at No. 16, Finsbury-circus, and the joint practice will be conducted at Mr. Griffin's offices, 24, Coleman-street, E.C., under the style of "Griffin & Woollard."

CHURCH OF ST. PETER, GREAT WINDMILL STREET.—The Bishop of London has appointed a commission to consider, and to report upon, the expediency of pulling down the Church of St. Peter, in view of the diminution of the resident population. St. Peter's was erected after plans and designs, in the Decorated style of R. Brandon, and consecrated on June 12, 1861, the organ being by Gray & Davidson. There are 700 sittings, and the patronage rests in the rector of St. James's, Piccadilly. The site, on the east side of Great Windmill-street, adjoins that of the Argyll dancing-rooms (formerly the tennis court of Piccadilly Hall), since rebuilt as the Trocadero Restaurant.

MEMORIAL TO LORD WILLOUGHBY DE BROKE, KINOTON, GLOUCESTERSHIRE.—The memorial raised to the memory of the late Lord WilloUGHBY de Broke by the relations and the members of the Warwickshire Hunt has now been completed in St. Peter's Church, Kington. It consists of a reredos, chancel screen, organ case and panelling in oak. The reredos consists of a triple canopy of vaulted woodwork, crowned by small pinnacles and cresting in the Jacobean style, in keeping with the altar and sanctuary chairs. On each side of the reredos and round the sanctuary is panelling in three rows, of which the two lower are a variety of the linen pattern. The organ case is a complete work of itself, of Renaissance design. At the bottom it is divided into three panels, of which one at the side forms a door, by which the two centre ones form a sliding cover to the keyboard. Above is a beam carrying brackets ornamented with the heads of cherubim, and these carry the pipes, and from them run up light pillars surmounted by crowns and joined by scrollwork. The chancel screen is divided into seven compartments, consisting of arches of Renaissance tracery to match the reredos, and carrying a frieze which is surmounted by a cross and an arcade of three arches, over the centre one being a broken gable. The lower parts of the screen consist of solid panelling. The whole is carried out in colour, and has been designed by Mr. John Belcher, A.R.A. The work has been executed by Mr. Garbie, of Aberdeen.

"THE MUNICIPAL YEAR BOOK."—"The Municipal Year Book of the United Kingdom for 1905," edited by Mr. R. Donald, and issued by Edward Lloyd, Ltd., Salisbury-square, E.C., shows an increase in size in comparison with the last issue. The present

edition has been revised, additions have been made to the various sections, and new information has been introduced. A brief review is given of the work of each local authority in alphabetical order, under the name of the city, town, or district, and statistics for general comparative purposes can easily be obtained. The eighteen sections of the book are in the following order:—(1) London Municipal Government (County Council, City Corporation, Borough Councils, Sanitary Districts, etc., etc.), (2) Municipal Government in England and Wales, (3) Municipal Government in Scotland, (4) Local Government in Ireland, (5) Water Supply, (6) Gas Supply, (7) Tramways, (8) Electricity Supply, (9) Housing of the Working Classes, (10) Markets, (11) Telephones, (12) Baths and Wash-houses, (13) Education, (14) Libraries, (15) Cemeteries, (16) Refuse and Sewage Disposal, (17) Local Taxation Returns, (18) Municipal Trading. There is also a directory of the principal societies and organisations connected with the various branches of local government. We have tested the book in various ways, and have found it a well-arranged and reliable work.

SALE OF ART BOOKS.—Messrs. Lawrie's joint collection of art books, consisting of 104 lots was sold for 1,043l. 6s. at Christie's rooms last week. The chief items included the following:—History of the Works of Sir Joshua Reynolds, 1899-1901, A. Graves & W. V. Cronin, 62s.; two copies of John Smith's Catalogue Raisonné of the Works of the most Eminent Dutch, Flemish, and French Painters, 52l.; J. Chaloner Smith's British Mezzotint Portraits, 1884, an illustrated edition, 32l.; Lodge's Portraits, proofs on India paper, in six volumes, 24l.; Sir E. J. Poynter's National Gallery, 1899-1900, and L. Cust's National Portrait Gallery, 1901-2, five volumes, 22l.; Sir Walter Armstrong's Gainsborough and his Place in Art, 1893, 11l., and his Sir Henry Raeburn, 1901, 5 guineas; Galerie du Palais Royal, with upwards of 350 highly-finished engravings by J. Couché, 1781-1808, 20l.; W. Bode & C. H. de Groot's Complete Works of Rembrandt, Paris, 1897-1902, 50l.; and Sir Joshua Reynolds's Works, 500 mezzotint engravings by S. W. Reynolds and others, five volumes, 78l. Amongst other lots were Christie's Sale Catalogues of many celebrated collections, such as the Pender, Magniac, Hope, and others, and a set, in seventy-three volumes, of French Picture Sale Catalogues, 1767-1896, 59l.

TEE-SQUARES AND SET-SQUARES.—Messrs. Longmans, the well-known publishers, who seem to have taken a certain class of drawing-instruments as a speciality, send some tee-squares on Professor Low's patent model. We have before referred to the set-squares, which are made with a thin coating of celluloid on each face, which, while it is easy to keep clean, keeps the actual drawing of the square away from contact with the paper, and thus lessens the liability to blots from an overful pen. They now send us a series of tee-squares made on the same principle, which has the same advantages as in the set-squares. They look very neat and clean, and will probably pick up less dirt and dust than plain wooden squares. The edges are not high, but the wood blade which forms the foundation for the celluloid face is not quite thick enough, or else is not hard enough wood, to ensure the stiffness desirable in a tee-square. The makers had better alter this even at the cost of raising the price a little. A tee-square of which the blade is all of elastic will not recommend itself in the long run, however neat and clean is its finish. The makers have also produced some extra large set-squares, 17 in. on the longest side, which are most useful; and these are thick and substantial, and will work well. Messrs. Longmans send us also a sample of the Vector set-square, a very useful instrument. This set-square is made from the area next the hypotenuse cut out—i.e., it has only two ruling sides, the vertical and the horizontal, and in the angle between them is fixed a flat circular brass hinge to which is attached a movable arm which can set at any angle desired within the limits of the vertical and horizontal ruling lines, and can thus supply parallel lines at various angles; a thing often required in plan-drawing.

BUNGALOWS AND BUILDING BY-LAWS.—A letter has been sent by the Local Government Board to the Rural Council of Hayfield, in the Peak district of Derbyshire. In the Peak district of Derbyshire, many citizens of Sheffield and Manchester have erected residences of the bungalow type, and some of these do not conform in some respects to the requirements of the local by-laws. Quite recently, cases of the kind have occurred in the Hayfield district, and the District Council have written to the Local Government Board, asking to be given discretionary powers as regards the application

of the by-laws—which are only of recent compilation—to buildings of an exceptional character. The letter from the Local Government Board was forwarded to the Board of Health observations of the Court in the case of Salt v. Scott Hall, to which you have referred them. Although there may be individual cases in which a dispensing power might occasionally be thought useful, the Board feel that the reservation of local authorities of a general power of relaxing the provisions of by-laws at will would not improbably lead to difficulties more serious than those which the absence of such power produces; and it is, therefore, contrary to their practice to allow clauses giving such a power. The proper course for the District Council to adopt would seem to be to consider the modification or division of the existing by-laws, and so far as the Board are aware, this could be done without entailing material expense beyond that of printing. A copy of a clause, which has been adopted by some local authorities, exempting small dwelling-houses, subject to certain conditions as to size and position, from the provisions of the by-laws with respect to the structure of walls, is enclosed herewith, and I am to suggest that the Council's object might, to some extent, be met by the adoption of a by-law based on this clause. The Board, however, are of opinion that the Council would be well advised to consider whether it is possible to relax the requirements of the by-laws in some cases without advantage be made. The Council might make a series, based on the rural model, with respect to new buildings, and certain matters in connexion with new buildings of which copies are enclosed. This series could be supplemented, if need be, by some provisions with respect to new streets and the structure of walls, etc., for securing stability and the prevention of fire derived from the urban model as to new streets and buildings of which copies are also enclosed. The Board will be prepared to consider any proposal which the Rural District Council may make with a view to framing by-laws more suitable to the district than the by-laws at present in force. It would be open to the Council to frame different series for the urban and rural portions of the district, provided those portions could be clearly defined so that the series in force in any particular place could be easily ascertained from the by-laws by any person interested. The Board requests that any proposals of the Council may be submitted on the model forms for their preliminary approval before any steps are taken with a view to the formal adoption of the by-laws, and it would be of assistance to the Board if the draft by-laws were submitted in duplicate.

WILLIAMSON PARK, LANCASTER.—At the meeting, on February 22, of the Lancaster Town Council, it was announced that Lord Ashton had undertaken to supplement his recent munificent gifts to the town by an offer to defray the further expense (from £5,000 to £6,000) of improving and beautifying Williamson Park by the erection of a pavilion and palmhouse, a bandstand, and other ornamental accessories, for which Mr. Belcher, A.R.A., has prepared the plans and designs. In November, last year, Lord Ashton agreed to expend a minimum amount of £5,000 upon new municipal buildings at Lancaster, to take over and maintain the present town hall for the benefit of the town, and to give from £5,000 to £30,000 for the buildings in the park, together with £2,000 as endowment.

ACCIDENT INSURANCE OFFICES, NORWICH.—Messrs Mark Fawcett & Co. ask us to mention that the fire-resisting floors in this building, illustrated in our last issue, are on their system.

BRITISH FIRE PREVENTION COMMITTEE.—The Report No. 91 of this Committee, just issued, records the result of tests for resistance to the fire of the electro-glazed casements of the Late Prism Syndicate. It is satisfactory to find that this very new-looking system of glazing, in which the metal joinings of the panes are much thinner than can be attained with leaded lights, proved quite efficient against fire. The fire test lasted three-quarters of an hour, attaining a temperature of 1,500 deg. Fahr. The following is the summary of result in the Committee's Report:—"The squares of electro-glazing in each of the lights commenced to crack immediately after the gas was lit and other squares continued cracking during the test. In fifteen minutes the glazing in the two weak frames commenced bulging, one (No. 1) towards the fire, and the other (No. 3) from the fire; this bulging increased during the test from 4 in. (0.063 m.) to 4 in. (0.102 m.). The weak frame (No. 1) which was set nearly flush on the fire side was burning freely; the burning subsequently decreased and was renewed in twenty-one minutes. In forty minutes the weak transom of this frame

was aglow on the side away from the fire. The glass was not displaced from its electro-glazing in any of the lights. On the application of water at forty-five minutes, the whole of the glazing was covered with small hair cracks, presenting a frosted appearance, but was not displaced. There were indications that fire had passed between the glazing and the wood frames. The fire did not pass through the glazing."

ARTISANS', LABOURERS', AND GENERAL DWELLINGS COMPANY.—The thirty-eighth annual report of the Company gives the details of their London properties as follows:—Shaftesbury Park, Battersea, 424 acres; thirty shops, 1,135 single houses, thirty-three double houses (two tenants each), and one block of twenty-two tenements; rental for the year, 29,274l. 9s. 5d., being an increase of 208l. 1s. 8d. Queen's Park, Harrow-road, 76 acres; 116 shops, 2,071 single houses, 108 double houses (two tenants each), and a public hall; rental for the year, 66,501l. 12s. 10d., being an increase of 424l. 8s. 5d. Noel Park, Wood Green, N., 100 acres; eighty-five shops, 1,226 single houses, and 225 double houses (two tenants each), covering more than half the area; rental for the year, 31,554l. 19s. 11d., being an increase of 733l. 5s. 11d. During 1904, 150 single houses and fifty-one double houses have been completed, and a large number of these have been let. Besides these, 110 single houses were commenced, and will be completed in August 1905. It is proposed to commence 174 single houses during 1905. Leigham Court, Streatham, S.W., 66 acres; thirty-three shops, eighteen flats, 355 houses, and 530 maisonnettes. Besides these, forty-one houses are finished or structurally complete, and will be ready for occupation during 1905. Rental for the year, 24,742l. 7s. 6d., being a decrease of 151l. 15s. It is proposed during 1905 to erect a few houses at the Streatham High-road end of Downton-avenue should the demand for houses increase. Block buildings, rental for the year, 34,313l. 15s. 1d., being a decrease of 199l. 9s. 5d., owing to shops at Lisson-grove remaining vacant during part of the year. Mr. H. B. Measures, having been selected by the Secretary of State for War as the Director of Barrack Construction, has resigned the position of the Company's architect, which he had filled for fourteen years. Mr. G. J. Earle, who has been confidentially associated with Sir Richard Farrant for the past eleven years in the management of the Company, has been appointed to the position of surveyor, with superintendence of the architectural staff, and it has therefore not been deemed necessary to fill in any other way the vacancy caused by Mr. Measures' resignation.

PROPOSED SEWAGE WORKS, TAUNTON.—Colonel A. J. Hepper, D.S., R.E., an inspector of the Local Government Board, held an inquiry at the Municipal Buildings, Taunton, on the 21st ult., concerning an application by the Taunton Town Council for sanction to borrow a further sum of 10,000l. for the purpose of sewerage and sewage disposal works. The Town Clerk (Mr. G. H. Kite) explained the reasons for the application, and described in detail the history of the sewage works, ending with the adoption of the septic tank system. Through the construction of the new works the cost of working had been reduced from 800l. a year in 1899 to 470l. last year. Mr. Arthur J. Martin, A.M.Inst.C.E., of Westminster, a member of the firm of Messrs. Cameron, Committ, & Martin, engineers to the Septic Tank Syndicate, and Mr. C. R. Richardson, C.E., gave evidence, after which the inquiry closed.

A BRADFORD ARBITRATION.—Mr. J. J. Wright sat, on the 20th ult., as arbitrator in a High Court action, brought by Messrs. A. & C. Darnes, masons and builders, of 71 Derby-road, Thornbury, against Messrs. A. & W. Duckett, stone merchants, of Wensley Bank, Thornton-road, Thornton, to recover a sum of 179l. 11s. 5d., the balance due upon the building of twenty-nine dwelling-houses at Woodhall-terrace, Thornbury. The hearing of the arbitration proceedings took place at the Talbot Hotel, Bradford. Mr. Henry Waddington represented the plaintiffs, and Mr. A. V. Hammond the defendants. The plaintiffs, it was shown, entered into a contract for the building of the houses in question. The terms of the contract were three times altered, and eventually an agreement was come to that the masons' and bricklayers' work should be completed for the sum of 2,420l., the houses to be finished in every respect like the first seven houses, counting from the south end of the same street, not exclusive of the end house. The plaintiffs alleged that in the performance of the contract extra work to the extent of 90l. 9s. 7d. was executed, either to comply with requirements of the Bradford Corporation or of special instructions of the defendants themselves. The defendants had, it was contended, paid in cash or in material a sum of

2,330l. 9s. 14d., and there was a balance claimed by the plaintiffs of 179l. 11s. 5d. The defendants, for their part, contended that the work done and claimed for as extras ought to be included in the contract price, and they denied that there was any balance owing. They counter-claimed for 25l., of which 16l. 9s. 5d. was special damages on particular items. The arbitrator went into detail into the various matters in dispute, and will give his award in the usual way.—*Yorkshire Observer.*

WAR MEMORIAL, PERTH.—The Black Watch Memorial in St. John's (East Parish) Church, Perth, has been unveiled by the Duke of Atholl, K.T. The memorial is made of copper. The design is a wreath of laurels and thistles entwined with a ribbon on which is inscribed the names of twenty-four battles. The thistle blooms are made of yellow and green enamelled gorms, amethysts, Ayrshire jaspers, and other Scottish pebbles. On the two top corners are two badges of the regiment, the Order of St. Andrew, and the Sphinx of Egypt, enamelled in colour on silver, and in the bottom corners are the old numbers of the first and second battalions of the Black Watch, 42 and 73. The centre plate is made of three sheets of copper with names of 209 officers, non-commissioned officers, and men chased in raised letters; while at the bottom are two figures of an officer and man in full arms. The memorial is the work of Mr. J. M. Talbot, Edinburgh.

THE CHAPEL, CARISBROOKE CASTLE.—The Bishop of Southwark, on behalf of the committee, appeals for contributions in aid of the equipment and decoration of the interior of the Chapel of St. Nicholas, and thereby to complete the reinstatement of the fabric for uses of public worship. The scheme of restoration was propounded five years ago by way of a non-political memorial to King Charles I. The reparation was entrusted to the superintendence and directions of Mr. Percy Stone, who has now completed all the structural work, the porch excepted. The King has presented the organ, reading-desk, and candlesticks formerly used in Queen Victoria's private chapel at Osborne House; the east window and a screen for the ante-chapel are amongst the objects which the committee desire to supply.

DUNSTAFFNAGE CASTLE.—The Duke of Argyll, Keeper of Dunstaffnage Castle, has opened a fund for the repair and maintenance of the local museum of the castle buildings. In a recess of the wall on the right hand of one entering the passage that leads into the great courtyard was formerly kept the Lia Fail, or Stone of Destiny, which, so runs the tale, Fergus brought from Tara, and Kenneth I., first King of All Scotland, removed to Scone in or about A.D. 850. Edward I. was crowned King of Scots on the stone which he conveyed to Westminster Abbey. A description, with a plan, of the present remains of Dunstaffnage, will be found in the *Builder* of November 1, 1902.

THE PEABODY FUND.—The fortieth annual report of the Governors of the Peabody Donation Fund states that the capital expenditure on land and buildings to the end of the year was 1,407,539l. 11s. 11d. The whole of the repairs, amounting to 13,331l. 12s. 10d., have been charged to income as formerly. The erection of the eighty-two cottages at the Herne Hill Estate, referred to in the last report, has been completed. Owing to the scarcity of applications the weekly rents have been reduced from 8s. 3d. to 8s. per cottage, exclusive of the charge for rates. At the end of the year the Governors had provided for the artisan and labouring poor of London 12,328 rooms, including those occupied by the superintendents and porters, besides bath-rooms, laundries, and lavatories. These rooms comprised 5,469 separate dwellings, viz., eighty-two cottages of five rooms, 101 tenements of four rooms, 1,828 of three rooms, 2,572 of two rooms, and 886 of one room. During the year the Governors have made a small additional purchase of about three-quarters of an acre of land fronting the site quarters of an acre of land in Tottenham, making a total area of 5 acres. The average weekly earnings of the head of each family in residence at the close of the year was 1l. 1s. 6d. The average rent of each dwelling was 4s. 3d. a week, and of each room 1s. 11d. in respect of those estates where the rates are paid direct to the local authorities by the tenants. In the cases in which the Governors still pay the rates, the average rent of each dwelling, including the rates, was 5s. 3d., and of each room, 2s. 4d. The rent in all cases includes the free use of water, laundries, sculleries, and bathrooms. The mean population during the year was 19,313, showing a density, after taking into account the occupied portion only of the Herne Hill site, of 635 people to the acre, or over ten times that of London.

Legal.

ACTION BY WOOD-PAVING CONTRACTORS AGAINST THE BRIGHTON CORPORATION.

The hearing of the case of Macartney, McElroy, & Co. v. the Brighton Corporation concluded in the Court of Appeal, composed of the Master of the Rolls and Lords Justices Mathew and Cosens-Hardy, on the 17th inst., on the application of the defendants for judgment or alternatively for a new trial of the action which was heard before Mr. Justice Grantham and a special jury in the King's Bench Division.

Mr. Fletcher Moulton, K.C., Mr. Boxall, K.C., and Mr. C. C. Scott appeared for the appellants, and Mr. Montague Lush, K.C., Mr. Cautley, and Mr. Moss Blundell for the respondents.

Mr. Moulton, in opening the case, said the action was brought by the plaintiffs, a firm of wood-paving contractors, in respect of a contract for paving in connexion with the electric tramway scheme of the Brighton Corporation. The action was tried before Mr. Justice Grantham and a special jury, and the judgment, so far as the principal part of it was concerned, was a judgment for the rectification of the contract in question. The ground for the present application was that there was no evidence whatever to go to the jury in support of the plaintiffs' case, and the defendants asked, on various other grounds, for a new trial. Counsel, proceeding, said that while the tramways were being constructed the Corporation thought it would be a good time for paving certain of the streets, and two specifications were prepared, one by the tramways engineer, and the other by the Borough Surveyor. Tenders were invited, and the plaintiffs were the persons selected to do the work. The judgment, as he had said, was really one of rectification of the contract on the ground that the parties did not intend to enter into the contract as drawn up, but mutually intended to enter into another contract whereby the plaintiffs were to receive a much larger sum for the work. To justify rectification of a contract, the learned counsel argued, must be mutual, but in this case his submission was that the only contract that the Corporation intended to enter into was that which was in fact signed by the parties. If the Corporation were right in their contention on the point of rectification, it would be unnecessary to trouble the Court with other matters raised by the case. The plaintiffs claimed that there was a mistake in the price that they named, and that they omitted to allow for the excavating and concrete work, and they therefore said that the sum named in the contract ought to be increased so as to cover the cost of this work. On the other hand, the Corporation alleged that the contract was for a lump sum for the whole of the work. At the trial the jury found that the lump sum was too small owing to an error by something over 14,000l., and the learned judge held that the intention of both parties was to make a contract whereby the plaintiffs were to be paid, in addition to the sum named in the contract, the whole cost of the excavating and concrete work.

Lord Justice Mathew asked whether the plaintiffs were not entitled to a reasonable sum in respect of the work the cost of which they said was omitted from their figures.

Mr. Moulton said that the only way the plaintiffs could succeed on their claim was by showing that there was a mutual mistake. The contract in question was with a local authority acting under the Public Health Act, and it was given under the seal of the Corporation in accordance with section 174 of that Act, which required that all contracts for sums above 50l. should be given under seal. The learned counsel, having dealt with the evidence in detail, said that the burden was upon the plaintiffs of showing that the contract which was signed was not the contract which both parties intended. He submitted it was impossible to show that the Corporation intended to enter into an agreement under which they were to pay, in addition to the lump sum, a sum of 14,000l. The only contract which was in the minds of the Corporation was the one which was in fact signed, and no other. He contended that the contract being under seal, it could not be rectified unless there was something clearly identifying the intention otherwise than that expressed in the contract. He submitted there was no such evidence, and, as a matter of law, there could be no rectification.

Mr. Boxall followed on the same side. In the result it was stated that the parties had agreed to terms, and judgment was entered for an agreed amount to end the litigation.

The terms of the settlement were not mentioned in Court.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

27,259 of 1904.—A. STRAUSS: *Method of Producing or Constructing Concrete Piles or Foundations.*

A method of producing or constructing concrete piles of great supporting capacity, consisting in temporarily lining the hole (previously bored) by means of a pipe, and introducing the concrete therein, then ramming down said concrete and causing same to spread below the pipe lining according to the nature of the surrounding earth, and subsequently raising said lining ready for a further charge of concrete to be rammed down, the process being repeated until the pile or foundation is completed.

27,372 of 1904.—H. WESTPHAL: *Construction of Ceilings or Floors and Bricks or Tiles for Use Therein.*

A ceiling brick or tile, provided with a lateral projection or lateral projections, and at the ends with bevels or grooves on the upper and lower edges only, so arranged that, when a number of such bricks or tiles are properly assembled, so forming a ceiling or floor, the recesses formed above the lateral projections are in free communication with the recesses formed by the lower end baffles or grooves.

27,857 of 1904.—M. GERSTNER, F. FREUND, S. FREUND, and T. IMBS: *Manufacture of Bricks from Magnesite.*

A process for making artificial bricks of magnesite by calcining the raw magnesite and grinding the calcined magnesite, after which the ground product is formed into bricks or blocks and again fired, partially effecting the alteration of volume of the magnesite during the first calcination of from 30 to 50 per cent. by mechanical means, partly in order to save fuel, and partly to facilitate the grinding of the calcined magnesite, the firing of the pressed blocks taking place in the ordinary manner.

28,244 of 1904.—G. PAPE: *Cramps and the Like for Joiners' Use.*

A glue-press actuated by toggle action, comprising a plurality of superposed cramps, each cramp being pivoted to that beneath, so that, on swinging the cramp above on its pivot the pressing jaws of the cramp beneath are moved towards each other so as to press together the boards being glued.

28,837 of 1904.—R. B. HUGUNIN: *Sash Fasteners.*

This consists in the combination with a sash lock having a face plate and locking-tongue lever pivoted thereto, operated by hand and spring pressure, the locking-tongue lever plate provided on each side near the upper end with concave hooked-formed pivotal-bearing surfaces, embracing, on the rear side, more than the vertical or longitudinal halves of the pivots employed in connexion therewith, to prevent the disconnection of the pivotal parts through the workings of the lock.

6537 of 1904.—E. C. RANSOME: *Concrete-Mixing Machinery.*

This invention relates to that type of mixers known as batch mixers, in which the material to be mixed is placed into the mixer a batch or charge at a time, and is in like manner discharged when mixed. The mixer consists of a rotary drum or shell fitted with a plurality of baffles and mounted to rotate on a pair of rollers carried by a horizontal shaft, one of the rollers being fast and the other loose on the shaft. The drum is rotated from the shaft by means of a gear-wheel on the drum meshing with a pinion on the shaft.

27,177 of 1904.—F. SCHAUB: *Building Stones.*

Building stones made of plaster, gypsum, or the like, distinguished by having channels or borings closed at one end and formed in them for the purpose of reducing the weight and the stopping of sound, such stones being also formed with grooves and tongues corresponding to one another so that a good binding together of the stones may be obtained at small cost of cement.

28,229 of 1904.—G. J. HONE and THE THAMES IRONWORKS SHIPBUILDING and ENGINEERING COMPANY, LTD.: *Grabs.*

A grab, consisting in the use of discharging gear, comprising one or more pawls hinged to the sheave block, a balance weight acting in conjunction with each of the pawls, and also hinged to the sheave block, one or more notches or recesses in the pin attached to the sliding cross-head, and a fixed stop for each of the balance weights.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

2,158 of 1904.—W. M. DUCKER: *Portable Houses.*

A portable house having its sides and ends formed of primarily constructed sliding sections of uniform width, and abutting edge-to-edge, the upright members of said sections having each a longitudinal groove, a tongue thereon which serves to exclude the air, and a locking means mounted in said upright members for drawing together the sections.

2,445 of 1904.—C. OBRZOWICZ: *Arrangement for Increasing the Circulation in Hot and Warm Water Heating Apparatus.*

An arrangement for increasing the circulating power in hot, warm, or steam heated water heating installations as well as for obtaining the desired temperature of the water conducted to the radiators, characterised by the arrangement of a water superheater, of a pipe carried upwards from said superheater, a pipe for the water that does not pass through the superheater such as an injector or like, consisting of two principal parts, one the motor, the nozzle of the injector operated by the superheated water, or by the steam given off from same, or by the mixture of steam and water which is conducted to the motor part from the superheater through the ascending pipe, while the superheater is fed by a part of the water flowing to or from the heating installation, and a second part, the suction part, for example, the suction chamber of the injector sucking the "circumfluous" water, so that it intimately mixes with the superheated water, said mixture being then forced on towards the radiators, whereby the circulating force of the heating installation is considerably increased, although the temperature of the mixture may be maintained considerably under 100 deg. C.

2,619 of 1904.—C. H. T. BRINK: *Means for Assembling School Benches, and other Pieces of Furniture, and Raising Them as a Whole from the Floor.*

This invention has for its object means for uniting all the school benches and desks of a classroom in such a manner that by the intermediary of a suitably-arranged windlass they may be raised from the floor, so as to facilitate the cleaning of this latter. A row of benches is formed by a number of benches and desks, one extending one behind the other. They are connected together by means of the sills fastened to them at the foot of the side boards. Each row of benches can be raised by means of a set of pulleys. By this practice a greater number of pulleys would be necessary to raise several rows; the sills may therefore be connected together at their ends by transoms, so as to make several rows of benches into a suspendable whole.

2,714 of 1904.—G. W. BEECH: *Door and Window Fasteners.*

A construction of fastener for doors or hinged windows, consisting of an ordinary hinge-like appliance so constructed that the hinge-pin is movable and has a nub or ribs which can be caused to engage with grooves or slots in the lug of one or both members of the fastener for locking same.

2,905 of 1904.—H. J. MARKS: *Arrangement of Window Sashes and Parts Connected Therewith.*

This invention relates to a manner of opening and holding window sashes in angle positions particularly applicable for ventilating the rooms, and also offers facilities for turning the outside of a window sash to the inside of a room for cleaning. According to this invention a bar or rod is affixed to the inside of a bottom sash by an eye or loop, and hinged or pivoted by an eye or loop joined to a bracket fixed to the stile of the top sash, either centrally or above or below the centre of both centrally or above or below the centre of both sashes, either centrally or above or below the stiles of top and bottom sashes. The bottom sashes, and, in some cases, the said bar may be arranged and held at the back of the stiles of top and bottom sashes. The bottom stiles of top and bottom sashes are hinged to rail of bottom sash is hinged to sill of an window to admit of the sash opening in an outward direction, or the bottom ends of sash may be pivoted to jambs of window frame for same purpose.

5,514 of 1904.—W. NICHOLSON and G. CHAPMAN: *Wood Blocks for Flooring and like purposes.*

This relates to wood blocks for flooring and like purposes, consisting in the provision of a prestretched groove cut in the centre of the material as it passes through a moulding or like machine, leaving the outermost edges or portions to act as seats for bedding down to the cement or like composition.

7,156 of 1904.—A. ILLIDGES: *Construction of Lock and Latch Cases.*

A lock or latch case of which either the cap or back plate or both the plates is or are put in place by being slipped endways into longitudinal grooves formed in the rim, and is or are securely retained in place by means of the fore-end.

8,008 of 1904.—R. R. MATIN and J. J. CAMERON: *Vertical or Pale Fencing.*

Vertical or pale fencing, composed of corrugated upright plates slit and creased to reverse the corrugations on opposite sides of such slits, and rounded horizontal bars having tongues adapted to enter the funnel like channels or pockets formed by the corrugated and slit plates.

15,357 of 1904.—W. S. HARKUS and J. E. HOTTAGE: *Adaptable Window Blind Roller with Simplified Check-action Fittings.*

An improvement on Patent No. 27,782 of 1903, viz., an endless cord running in an ordinary pulley-wheel either with or without a rubber bed and a spindle, which wheel falls into an open eye of a bracket. Upon the bed of the open eye the endless cord is impressed and held in position by a spring. The apex of the spring is held in place on the bracket plate with a pin. Two other guide-pins are used for keeping it in tension on the cord when in operation either in pulling up or down.

16,631 of 1904.—H. SCHNEIDER: *Floors.*

A process for making floors, characterised by two grates having longitudinally-running rods of iron or similar material, provided with longitudinal ribs or flanges, and joined together by means of rods of iron or similar material running vertically and in zigzag course, into which artificial stone or hewn natural stones of the shape of double pyramids with concave or conical angular sides are inserted, whereupon the space left between them is filled up with cement, which forms after being dried out, a rigid support column.

26,486 of 1904.—W. T. MITCHELL: *Window Fastening.*

This consists in the combination of a tongue pivoted near one end in a bracket fixed in a recess in the pulley style of a window frame, a window sash having wedge-shaped recesses to receive said tongue, the tongue being chambered to receive a key or tumbler, a spring for operating said key, and a thumb-piece upon the end of the spindle.

23,315 of 1904.—E. A. J. HOOPER: *Ash Guards and Ash-pan Fronts.*

An ash guard or ash-pan front, consisting in elevating the lower edge from the hearth through the medium of feet, knobs, or other lifts formed integral with or attached to the said guard or front or to certain of the sections or panels of a flexible guard or front.

20,357 of 1904.—F. I. LUMLEY: *Fastener or Grip for Linoleum or Wood Mouldings or the like.*

This invention relates to the construction of a fastener or grip that can be used to fix linoleum to floors or mouldings to woodwork or such like purposes, and consists of a small metal plate, of a thickness corresponding to the strength required, with part of the edges cut away or slit at a suitable angle from the edges so as to leave V-shaped points at the edges; these points are then turned, some up and others down, at right angles to the metal plate. The points can be formed out of any part of the flat plate by stamping them, some up and others down, at right angles to the flat plate, but if the points are made on the edges of the plate to the number of six points—that is, three turned up and three turned down—the three points on either side, being in position triangular or nearly so, it will be found the fastener or grip will lie more readily in position for fixing. The points can be made of various lengths, according to the holding power required of them, and can also vary in the number of points and the position of them on each fastener or grip.

26,488 of 1904.—L. C. RUGEN and H. ABRAHAM: *Flexible Roofing and Flooring.*

A process of manufacturing a flexible material, which consists in impregnating a suitable fabric with a hydrocarbon mixture and then applying to the foundation thus formed, and while the hydrocarbon mixture is soft and plastic, a coloured facing, consisting of a pigment and a mixture of a resinous body with a "lead" body, such facing being applied in a heated plastic condition so as to cause said coating to interlock with the foundation.

25,502 of 1904.—K. JAVAY: *Compound Concrete and Iron or Steel Structures for Floors, Roofs, and Bridges.*

Compound concrete and iron or steel structures for floors, roofs, and bridges, consisting of a

concrete arch, on the underside of which are transverse straight ribs in which are embedded straight tie plates or grips of tie rods, the ends of which are made to constitute anchors embedded in the concrete.

25,584 of 1904.—F. CAMBERMALE: *A Process and Contrivance for the Purification of the Air of Workshops, Living-rooms, and other places.*

A process and contrivance for the purification of the atmosphere of workshops, living-rooms, and other places, characterised by a casing, a cylinder, or any other similar arrangement having at one of its ends the entrance opening, and at the other opening for escape, and between these two openings, a series of partitions alternately incomplete, and by preference suitably perforated and provided with a thin layer of wadding of cotton, flax, or any other fibrous and stringy material which has been rendered non-ignitable, through which the air to be purified filters on coming out through a slot or stove or by being forced into it by means of a ventilator.

23,135 of 1904.—D. W. ADAMS: *Fireproof Curtains.*

A fireproof curtain, composed of a series of slats, each of which, except the lowermost one, is provided on its front side with separate strips having raised portions containing guide slots, and each of which slats, except the uppermost one, is provided on its rear side with bolts which interlock with the slotted strips of the slat next above it.

23,256 of 1904.—S. VON MROKOWSKI: *Floors of Buildings.*

Means for the ventilation of wooden floors, consisting of boards furnished underneath with grooves or passages, the ends of which boards are separated by a small space from the wall and a skirting is rabbeted or otherwise formed so as to provide passages which communicate with the said grooves of the boards, one of said skirting passages being provided with an inlet communicating with the interior of the room or with the outer air, and the passage of the outside skirting being formed with an outlet opening into a chamber or stove, the inlet being placed at the farthest point from the outlet.

23,350 of 1904.—T. WEISSER: *Locks for Doors and the like.*

A lock adapted to be used for right or left hand and as a rim or cupboard or mortice lock, having a tumbler carrying a star or the like, formed with three heads, each serving as a latch or bolt for a particular purpose, the said star being rotatably attached to the tumbler by a screw, and adapted to be fixed by a screw on said tumbler so that either the head serving as a lifting latch, or either of the other tapered heads serving as right and left sliding bolts respectively, may be made to project through the side of the case.

18,804 of 1904.—C. W. BRUNSON: *A Composition of Matter for Artificial Stone.*

A composition of matter for artificial stone, consisting of cinders or other coarse insoluble material 35 lb., sand 15 lb., barytes $\frac{1}{2}$ lb., cement 2 lb., and water sufficient to make a thick slush.

SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

February 15.—By BUTCH & DURE.
Clapton—1, 6, and 7, Clifden-rd., ut. 69 yrs.,
g.r. 15s., y.r. 84d. 2840

17, Clifden-rd., ut. 59 yrs., g.r. 2s., y.r. 90d. 275

By ERNEST OVERS.
Hampton, Middlesex—1 to 16, Station-rd.,
ut. 94 yrs., g.r. 39d., y.r. 80d. 4s. 1,700

Hamstead—97, Alexandra-rd., ut. 53 yrs.,
g.r. 15s., e.r. 100d. 850

By RUSHWORTH & STEVENS.
Regent's Park—4, Queen's Mews, ut. 40 yrs.,
g.r. 25s., y.r. 85d. 180

Clerkenwell—17, River-st., ut. 73 yrs., g.r. 8d.,
y.r. 50d. 10s. 120

58 and 59, Amwell-st., ut. 7 $\frac{1}{2}$ yrs., g.r. 13d.,
y.r. 67d. 245

Norwood—4, The Av., ut. 32 yrs., g.r. 2s. 1s.,
y.r. 80d. 600

Camden Town—102, Park-st. (s.), y.r. 88d. 1,165

Ventnor, Isle of Wight—High-st., l.g.r. 10d.,
reversion in 65 yrs. 255

By DOUGLAS YOUNG & CO.
West Ham—Baxter-rd., etc., l.g. rents 55d.,
reversion in 76 yrs. 1,100

Battersea—S. Auckland-rd., ut. 76 yrs., g.r.
7d., w.r. 38d. 8s. 800

Brixton—77, Akerman-rd., ut. 59 yrs., g.r.
8d., y.r. 55d. 450

Clapham—29 and 28, Summer-rd., ut. 65
yrs., g.r. 17d. 10s., y.r. 87d. 810

Rushall—Bush Hill-pk., 6, Second-av., ut. 43
yrs., g.r. 4d. 10s., e.r. 32d. 280

February 16.—By H. J. BRISS & SONS.
Shoreditch—49, 51, and 53, Amint-st. (s.),
y.r. 117d. 18s. 080

Walthamstow—32 to 38 (even), Summit-rd.,
l.g. rents 45d. 760

By BURT & SONS.
Tooting—Broadway, "The Lodge," with land
adjoining, l.g. 2,000

By CHESTERTON & SONS.
Kensington.—19 to 27, St. Alban's-rd., l.g.
w.r. 1,000d. 59,000

By J. C. PLATT.
Fulham—Ansell-st., l.g. rents 80d. 2s., rever-
sion in 60 yrs. 2,145

44 to 104 (even), Ancill-st., ut. 62 $\frac{1}{2}$ yrs.,
g.r. 51d., w.r. 80d. 12s. 5,100

Greyhound-rd., l.g. rents 123d., reversion in
60 yrs. 3,305

Greyhound-rd., "Prince of Wales Hotel,"
etc., l.g.r. 122, reversion in 60 yrs. 700

Greyhound-rd., "Colton Arms" b.h., l.g.r.
8d., reversion in 48 yrs. 220

Greyhound-rd., l.g. rents 80d. 16s., reversion
in 48, 52, and 67 yrs. 1,025

62 and 64, Greyhound-rd., l.g. rents 80d. 4s.,
87 to 97 (odd), Greyhound-rd., l.g. w.r.
210d. 14s. 1,125

Greyhound-rd., freehold building land, area
0 a. 0 r. 38 p. 2,705

Margrave-rd., l.g.r. 11d. 14s., reversion in
60 yrs. 805

By MORETON RICHES.
Wandsworth—34 to 48 (even), Burtop-rd., l.
w.r. 170d. 16s. 2,050

17 and 19, Harbut-rd., ut. 74 yrs., g.r.
13d. 10s., w.r. 62d. 555

Norwood—105 to 111 (odd), Queen's-rd., ut.
72 $\frac{1}{2}$ yrs., g.r. 16d., w.r. 100d. 4s. 700

By THOLE & NEWMAN.
South Kensington—12, Priory-gr., ut. 26 $\frac{1}{2}$ yrs.,
g.r. 5d. 10s., p. 600

February 17.—By DUFFY, SOMAN, & COVBER-
DALE.
Dalston—38 to 48 (even) and 48A, Holly-st.,
ut. 12 $\frac{1}{2}$ yrs., g.r. 25d. 12s., w.r. 241d. 6s. 640

By FISHER, STANHOPE, & DRAKE.
Stamford-hill—124, Bethune-rd., ut. 75 yrs.,
g.r. 12d., e.r. 80d. 800

By WALTER HALL.
Hamstead—92, Priory-rd., l.g. p. 1,725

Willenden Green—14, 15, 16, 18, and 20, Litch-
field-gdns., ut. 90 yrs., g.r. 22d., e.r. 190d. 950

By MULLETT, BOOKER, & CO.
Hyde Park—6, Hyde Park-sq., ut. 80 yrs.,
g.r. 30d., y.r. 27d. 2,800

23, Hyde Park-st., and 5, Southwick-yd.,
ut. 30 yrs., g.r. 11d., y.r. 24d. 2,900

10, Polygon-mews South, ut. 18 yrs., g.r.
5d., y.r. 23d. 105

Hyde Park-st., l.g.r. 80d., ut. 30 yrs., g.r.
4d. 1,150

Gloucester-sq., l.g.r. 50d., ut. 31 yrs., g.r.
10d. 560

Gloucester-sq., l.g.r. 210d., ut. 31 yrs., g.r.
2d. 3,025

Gloucester-rd., etc. l.g.r., 116d., ut. 38 yrs.,
g.r. nil 1,810

By TYSSER, GREENWOOD, & CHURCH.
Chiswick—581, High-rd., ut. 64 yrs., g.r. 5d., p.
February 16.—By SIMMONS & SONS (at Ban-
bury). 460

Greatworth, Northants.—"Floyds" and
"Whitman's" Farms, 160 a. 1 r. 27 p., l.
e.r. 285d. 4,225

Brackley, Northants.—High-st., freehold house
and gdn., y.r. 14d. 310

February 18.—By TUCKETT & SON (at South-
end-on-Sea).
Leigh-on-Sea, Essex—1 to 6, Hill-villas, l.
y.r. 88d. 2,010

1, 2, and 3, Ivy-cottages, l.g. y.r. 19d. 10s. 400

23, High-st. (s.), l.g. y.r. 18d. 320

Great Wakering, Essex.—Freehold shop, house
and premises, y.r. 30d. 510

Freehold shop and two cottages, e.r. 25d. 125

Two freehold shops and houses, y.r. 24d. 270

Two freehold cottages, e.r. 8d. 110

February 20.—By BROWETT & TAYLOR.
Highbury—15, Highbury-pl. (s.), l.g. y.r. 125d.
Croydon—34, James Pl., "Rosslyn Villa," l.
e.r. 88d. 2,180

Wandsworth—328, Merton-rd., l.g. e.r. 34d. 400

St. George's East—103, St. George's-st. (s.),
l.g. y.r. 48d. 620

Whitechapel—16, Fieldgate-st. (s.), l.g. y.r. 60d.
Mile End—48, Lincoln-st., l.g. w.r. 36d. 8s. 785

By HY. HOLMES & CO.
Pimlico—4, Gloucester-st., ut. 26 $\frac{1}{2}$ yrs., g.r.
10d., e.r. 90d. 545

By S. WALKER & SON.
Balham—Balham High-rd., l.g. rents 24d.,
ut. 30 $\frac{1}{2}$ yrs., g.r. nil 285

By T. WOODS.
Sutton, Middlesex—Main-rd., "Harts" other-
wise "Sutton Farm," also "Springwell"
Fruit Plantation, area 46 a. 2 r. 20 p., l.
e.r. 278d. 6,250

By WILKINSON, SON, & WELSH (at Brighton).
Hove, Sussex—1, Medina-ter., and 1A, Victoria-
ter. (flats and shop), l.g. y.r. 3s. 3,275

February 21.—By C. H. BROWN.
Pimlico—62 and 64, Bessborough-st., ut. 27
yrs., g.r. 10d., w.r. 78d. 500

Westminster—41 and 43, Vincent-st., ut. 4 $\frac{1}{2}$
yrs., g.r. 14d., w.r. 59d. 10s. 260

By PERKINS & SONS.
Southampton—The Polygon, "The Elms
Estate," 6 a. 2 r. 34 p., l.g. 7,550

By REYNOLDS & EASON.
St. George's East—51, 53, 55, and 59, Cable-
st. (s.), c. y.r. 100d. 1,805

By INMAN SHARP, HARBINGERS, & CO.
Regent's Park—17, Brown-st., ut. 50d.
Finsbury—78 to 84 (even), Clifton-st., l.g. y.r.
100d. 2,110

By HOBSON, RICHARDS, & CO. (at Crikeldale).
Crikeldale, Wiltshire—"Plants Farm," 4 $\frac{1}{2}$ a. 2 r.
9 p., l.g. y.r. 50d. 1,270

Han and Leys enclosures, 7 a. 0 r. 25 p., l.
y.r. 14d. 265

By H. & B. L. COBB (at Rochester).
New Bromwich, Kent—Jeffrey-st., "The
Flower of Kent" b.h. with house and
land adjoining, l.g. y.r. 120d. 3,000

By G. LOVETT & SONS (at Coventry).

Coventry, Warwick—7 and 8, Chaylesmore,

1, y. r. 281. 5410

59 and 60, New-buildings, 1, w. r. 24. 385

10 and 12, Swallow-st., with slaughter

house, 1, y. r. 401. 280

50, Stoney Stanton-rd., 1, y. r. 181. 600

15, Ford-st., 1, y. r. 251. 540

25, Little Park-st., 1, y. r. 181. 300

Moort-st., a plot of building land, 1, 104

47 and 49, Arden-st., 1, 280

12, 13, 40, and 41, Mount-st., 1, 775

February 22.—By S. P. CLARK & SONS

Cavendish-square—12, Upper Wimpole-st.,

u. t. 73 yrs., g. r. 251. p. 5,750

Marleybone—48, Portland-pl., and 8, Char-

lotte-mews, u. t. 25 yrs., g. r. 1501. p. 5,600

10, Duke-st., u. t. 41 yrs., g. r. 301. p. 315

By EDWARD & CO.

Whitechapel—83, Church-ls. (s.), 1, with

fixtures and fittings. 800

10, Mile End—62 to 70 (even), Ernest-st., 1, w. r.

1221. 4s. 1,080

By WM. HOLLS.

Hendon—18 and 18A, Ravenhurst-av., u. t. 96½

yrs., g. r. 61. 280

Sunny-gdns., a fresh building site. 400

By MAY & PHILIP.

Brixton—89, Aroclene-rd., u. t. 85 yrs., g. r.

70, p. 560

102, Aroclene-rd., u. t. 85 yrs., g. r. 81, p. 600

14, Ardu-rd., u. t. 84 yrs., g. r. 61. 285

Streatham—4, Tenham-av., 1, y. r. 721. 8s. 690

By ROBERTS, CHAPMAN, & THOMAS.

Fimble—79, Claverton-st., u. t. 28½ yrs., g. r.

104, p. 490

By R. TIDY & SON.

Walthamstow—286, Hoe-st. (s.), 1, y. r. 901.

February 23.—By WORSFOLD & HAYWARD.

Tunbridge Wells, Kent—Warwick Pl., "Cliff

House" and 1 acre, u. t. 84½ yrs., g. r. 301, p. 2,800

Harlestone—22, Tunley-rd., u. t. 57½ yrs., g. r. 61,

g. r. 321. 280

By HUMPHREYS, SKITT, & HUMPHREYS.

Greenwich—Croom's-hill, l.g. rents 481, reversion

in 30 yrs. 1,075

Croom's-hill-gr., l.g. rents 631, reversion in

30 yrs. 1,380

By G. C. & T. MOORE.

Horton—26, Buckland-st., u. t. 29½ yrs., g. r.

61, q. r. 361. 380

Mile End—72 and 74, Dempsey-st., u. t. 8½ yrs.,

g. r. 61, q. r. 901. 140

Boo—22, Vernon-st., 1, w. r. 441. 515

By RUTTERS.

Tooting—38, 40, and 42, Poveney-rd., u. t. 90

yrs., g. r. 91. 580

By NEWBORN, EDWARDS, & SHEPHERD.

Kentish Town—40 and 48, Dale-rd., u. t. 59½

yrs., g. r. 121. 8s. 875

11, Vicars-rd., u. t. 60 yrs., g. r. 61, y. r. 381.

Wood Green—15, Eastern-rd., 1, y. r. 321. 450

Islington—246 and 248, Essex-rd., u. t. 13 yrs.,

g. r. 61. 840

Holloway—2, Witley-rd., u. t. 88½ yrs., g. r.

51. 285

By STIMSON & SONS.

Kentish Town—16, Wellesley-rd., u. t. 41 yrs.,

g. r. 61, y. r. 321. 300

Tottenham—9, Pembury-rd., u. t. 73 yrs., g. r.

41. 275

Battersea—18 to 30 (even), John-st., u. t. 66

yrs., g. r. 241. 1,125

Greenwich—9, Frobiher-st., u. t. 51 yrs., g. r.

31. 205

Dulwich—447, Lordship-ls., 1, g. r. 751. 1,000

Wandsworth—24, High-st., 1, g. r. 81. 980

Hackney—2, Casterton-st., u. t. 73½ yrs., g. r.

51. 225

February 24.—By LEOPOLD FARMER & SONS.

Camden Town—104, Camden-st., u. t. 44½ yrs.,

g. r. 61, y. r. 501. 580

Hamstead-road—31 and 32, Edward-st., u. t.

16½ and 19½ yrs., g. r. 181, y. r. 1011. 725

55, William-st., u. t. 19½ yrs., g. r. 31, y. r. 401.

82 and 84, Robert-st., u. t. 18½ yrs., g. r. 141,

y. r. 801. 490

Regent's Park—Cumberland-market, etc.,

l.g. r. 271. 10s., u. t. 20 yrs., g. r. 71. 10s. 165

By MAPLE & CO.

Hamstead—88, Belalge-rd., u. t. 19 yrs., g. r.

71. 280

By WATSON, DIXON, & WINDR.

Fulham—60 to 74, Star-rd., with builder's

yard adjoining, u. t. 91 yrs., g. r. 301, w. r.

3841. 4s. 2,900

Contractions used in these lists.—F. & G. for freehold

ground-rent; L. & G. for leasehold ground-rent; L. & G. for

improved ground-rent; g. r. for ground-rent; f. for rent

f. for freehold; c. for copyhold; l. for leasehold; p. for

possession; a. r. for estimated rental; w. r. for weekly

rental; q. r. for quarterly rental; y. r. for yearly rental;

u. t. for unexpired term; p. a. for per annum; y. for

years; l. a. for lane; st. for street; rd. for road; sq. for

square; pl. for place; ter. for terrace; cres. for crescent;

av. for avenue; g. r. for gardens; yd. for yard; g. r. for

grove; b. h. for boathouse; p. h. for public-house; o. for

office; s. for shops; et. for court.

MEETINGS.

FRIDAY, MARCH 4.

Royal Institution.—Chevalier G. Marconi, LL.D., on

"Recent Advances in Wireless Telegraphy." 9 p.m.

Junior Institution of Engineers (Estimatee Palace

Club).—A Paper will be read on "Possible Improvements

in Locomotive Practice," by Mr. Walter Long-

land. 8 p.m.

SATURDAY, MARCH 4.

Royal Institution.—Mr. D. G. Hogarth, M.A., on

"Archæology." 11. 8 p.m.

Incorporated British Institute of Certified Carpenters.—

Mr. H. P. Fletcher on "The St. Louis Exhibition,"

illustrated by limelight views. 6.15 p.m.

MONDAY, MARCH 6.

Royal Institute of British Architects.—(1) Special

General Meeting, to elect the Royal Gold Medalist for

the current year; (2) Ninth General (Business) Meeting,

to elect candidates for membership; (3) Mr. H. Phillips

Fletcher on "The St. Louis Exhibition, 1904," with

lantern slides. 8 p.m.

Liverpool Architectural Society.—Mr. G. P. Bankhart

on "Lead Work," illustrated by limelight views. 8 p.m.

Glasgow Philosophical Society (Architectural Section).—

Annual Business Meeting. 8 p.m.

Society of Engineers.—Mr. B. H. Thwaite on "The

Transport Possibilities of our Inland Navigable Water-

ways." 7.30 p.m.

TUESDAY, MARCH 7.

Society of Designers.—Mr. E. F. Strange on "Ornament

from Old English Root-Screens," illustrated by

drawings and lantern slides. 8 p.m.

Northern Architectural Association.—Annual Meeting.

7.30 p.m. Discussion, to be opened by Mr. A. W. S.

Cross, M.A., and Mr. G. Hubbard, F.R.S., on "The

Statutory Classification of Architects."

Institution of Civil Engineers.—Paper to be dis-

cussed: "Surface-Condensing Plants, and the Value of

the Vacuum Produced," by Mr. R. W. Allen. 8 p.m.

WEDNESDAY, MARCH 8.

Edinburgh Architectural Association.—Mr. Hippolyte

J. Blanc, E.S.A., on "The Arts of the Monastery,"

illustrated by lantern slides. 8 p.m.

THURSDAY, MARCH 9.

Architects' Benevolent Society.—Annual General Meet-

ing of the Subscribers and Donors in the rooms of the

Royal Institute of British Architects. The President,

Mr. John Belcher, A.R.A., will take the chair at 6 o'clock.

Royal Institution.—Professor H. H. Turner, D.Sc., on

"Recent Astronomical Progress." II. 5 p.m.

Carpenters' Hall (London Wall).—Mr. J. Willis Clark,

M.A., F.S.A., on "The Art of the Carpenter," illustrated

by lantern slides. 8 p.m.

Society of Antiquaries.—8.30 p.m.

Leeds and Yorkshire Architectural Society.—Mr. E. C.

Slit on "Architectural Photography." 8 p.m.

Institution of Electrical Engineers.—Report on Experi-

ments carried out at the National Physical Laboratory:

"On the Effect of Heat on the Electrical and Mechanical

Properties of Dielectrics," and "On the Temperature

Distribution in the Interior of Field Coils," presented by

Dr. R. T. Glazebrook, F.R.S., and "On Temperature

Curves and the Rating of Electrical Machinery," by

Mr. R. Goldschmidt. 8 p.m.

FRIDAY, MARCH 10.

Royal Institution.—Professor J. J. Thomson, LL.D.,

D.Sc., on "The Structure of the Atom." 9 p.m.

Architectural Association.—Mr. H. V. Lanchester on

"Law Courts." 7.40 p.m.

Institution of Civil Engineers (Students' Meeting).—

(1) "The Purification of Sewage," by Mr. E. G. Helsby;

(2) "The Purification of Sewage by Hydrolysis and

Oxidation," by Mr. F. O. Kirby. 8 p.m.

SATURDAY, MARCH 11.

Royal Institution.—Professor J. J. Thomson, LL.D.,

D.Sc., on "Electrical Properties of Radioactive Sub-

stances." I. 3 p.m.

Junior Institution of Engineers.—Visit to the New

Ritz Hotel, Piccadilly, with a view to inspecting the

System of Constructional Engineering. 8 p.m.

Edinburgh Architectural Association.—Visits (1) to

Midlothian County Court Buildings; (2) the new Scots-

man Office Buildings.

PUBLISHER'S NOTICES.

Nat. Tel., 412, Gerrard. Telegrams, "The Builder, London."

THE INDEX (with TITLE-PAGE) for VOLUME LXXXVII.

(July to December, 1904) was given as a supplement

to the issue for January 1905, and is now ready, price

2s. 6d. each also

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Advertisements for the current week's issue are received up to

THREE O'CLOCK P.M. on THURSDAY, but "Classification" is

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DAY.

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The Publisher cannot be responsible for DRAWINGS, TESTI-

MONIALS, etc., left at the Office in reply to advertisements, and

strongly recommends that of the latter COPIES ONLY should be

STONE (continued).

YORK STONE—Robin Hood quality (continued).		s. d.	
3 in. sawn two sides	0 11 1/2	per ft. super.	deld. rly. depôt
4 in. to 24 in. sawn one side	0 7 1/2	"	"
4 in. to 24 in. (random sizes)	0 7 1/2	"	"
11 in. to 24 in. ditto	0 6	"	"
Hampshire	0 6	"	"
Scalloped random blocks	3	0 per ft. cube.	"
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	3	8 per ft. super.	"
6 in. rubbed two sides	3	0	"
3 in. sawn two sides (also random sizes)	1	2	"
2 in. self-faced random	0	5	"
days	0	5	"
Hopton Wood (Hard Bed) in blocks	2	8 per ft. cube.	"
" " 6 in. sawn both sides landings	2	7 per ft. super.	deld. rly. depôt.
" " 3 in. do.	1	2 1/2	"

SLATES.

s. d.		s. d.	
20 x 12 best blue Bangor	13	2	6 per 1000 of 1200 at r. d.
20 x 12 "	13	17	6
20 x 12 first quality "	13	15	0
20 x 12 "	13	0	0
20 x 12 "	7	5	0
20 x 10 best blue Portmadoc	12	12	6
16 x 8 "	6	12	6
20 x 10 best Bureks unfading green	15	17	6
20 x 12 "	13	5	0
20 x 10 "	13	0	0
20 x 8 "	10	5	0
20 x 10 permanent green	11	6	6
16 x 10 "	9	12	6
16 x 8 "	6	12	6

TILES.

s. d.		s. d.	
Best plain red roofing tiles	42	0 per 1000 at rly. depôt.	"
Hip and Valley tiles	3	7 per doz.	"
Best Drosely tiles	3	0 per 1000	"
Do. Ornamental tiles	32	6	"
Hip and Valley tiles	4	0 per doz.	"
Best Beakon red, brown, or leaded do. (Edwards)	57	6 per 1000	"
Do. Ornamental do.	60	0	"
Hip tiles	4	0 per doz.	"
Valley tiles	3	0	"
Best Red or leaded Staffordshire do. (Peakes)	51	9 per 1000	"
Do. Ornamental do.	54	6	"
Hip tiles	4	1 per doz.	"
Valley tiles	3	8	"
Best "Rosemary" brand plain tiles	48	0 per 1000	"
Best Ornamental tiles	50	0	"
Hip tiles	4	0 per doz.	"
Valley tiles	3	8	"
Best "Hartshill" brand plain tiles, sand faced.	50	0 per 1000	"
Do. second	47	6	"
Do. Ornamental do.	50	0	"
Hip tiles	4	0 per doz.	"
Valley tiles	3	6	"

WOOD.

At per standard.		s. d.	
Deal: best 3 in. by 11 in. and 4 in.	13	10	0
Do. by 6 in. and 11 in.	13	10	0
Deal: best 3 in. by 7 in. and 4 in.	13	0	0
Deal: best 2 1/2 in. by 7 in. and 3 in.	11	10	0
Deal: best 2 1/2 in. by 6 in. and 3 in.	10	10	0
Deal: seconds	1	0	0
Deal: seconds	0	10	0
Deal: 2 in. by 4 in. and 2 in. by 6 in.	9	10	0
Deal: 2 in. by 4 in. and 2 in. by 5 in.	8	10	0
Foreign Saw Boards—1 in. and 1 1/2 in. by 7 in.	0	10	0
3 in.	1	0	0
At per load of 50 ft.			
Fr timber: best middling Danzig or Memel (average specification)	4	10	0
Seconds	4	0	0
Small timber (8 in. to 10 in.)	3	12	6
Small timber (6 in. to 8 in.)	3	0	0
Swedish balks	2	10	0
Pitch-pine timber (30 ft. average)	3	5	0

JOINERS' WOOD.

At per standard.		s. d.	
White Sea: first yellow deals	24	0	0
3 in. by 11 in.	22	0	23
3 in. by 9 in.	22	0	23
Battens, 2 1/2 in. and 3 in. by 7 in.	18	10	0
Second yellow deals, 3 in. by 11 in.	18	0	0
3 in. by 9 in.	17	10	0
Battens, 2 1/2 in. and 3 in. by 7 in.	13	10	0
Third yellow deals, 3 in. by 11 in.	14	10	0
3 in. by 9 in.	13	10	0
Battens, 2 1/2 in. and 3 in. by 7 in.	11	0	15
Petersburg: first yellow deals	21	0	12
3 in. by 11 in.	21	0	25
3 in. by 9 in.	18	0	19
Battens, 2 1/2 in. and 3 in. by 7 in.	13	10	0
Second yellow deals, 3 in. by 11 in.	16	0	17
3 in. by 9 in.	16	0	17
Battens, 2 1/2 in. and 3 in. by 7 in.	11	0	12
Third yellow deals, 3 in. by 11 in.	18	0	14
3 in. by 9 in.	12	10	0
Battens, 2 1/2 in. and 3 in. by 7 in.	10	0	11
White Sea and Petersburg: first yellow deals	14	10	0
3 in. by 11 in.	14	0	15
3 in. by 9 in.	13	10	0
Battens, 2 1/2 in. and 3 in. by 7 in.	11	0	12
Second yellow deals, 3 in. by 11 in.	13	10	0
3 in. by 9 in.	13	0	15
Battens, 2 1/2 in. and 3 in. by 7 in.	10	0	11
Third yellow deals, 3 in. by 11 in.	10	0	11
3 in. by 9 in.	10	0	11
Battens, 2 1/2 in. and 3 in. by 7 in.	10	0	11

CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tending to be Done
Filters and Tank, Paisley Waterworks	Paisley Water Commissioners	J. Lee, Engineer, 15, Gilmour-street, Paisley	Mar. 3
Repair of Portable Steam Engine at Sewage Farm ..	Bomford U.D.C.	C. T. King, Clerk, Council Office, Bomford	Mar. 4
Paving and Flagging Streets	Leeds Corporation	City Engineer's Office, Municipal-buildings, Leeds	do.
Materials, Labour, etc.	do.	G. Darley, Dock-street Depot, Leeds	do.
Paving, Sewerage, etc. (several districts)	Manchester Corporation	Paving, etc., Dept. (Surveyor's Office), Town Hall, Manchester ..	do.
A 14-h.p. Horizontal Non-condensing Steam Engine ..	Birmingham Baths Committee ..	J. Cox, Superintendent Engr. & Sec., Kent-street, Birmingham ..	do.
A Set of Triple Deepwell Lifting Pumps	do.	do.	do.
Two Steel Steam Boilers	do.	do.	do.
Cast-Iron Cold Water Storage Tank	do.	do.	do.
Two Wrought-Iron Galvanised Tanks, etc.	do.	do.	do.
Two Special Steam Heaters	Chingford U.D.C.	H. Bird, Clerk, 34, Station-road, Chingford, Essex	do.
400 tons of Quansot or Guernsey Granite	Swansea Guardians	L. Jenkins, Clerk, Union Office, Alexandra-road, Swansea	do.
1,000 yds. of Stone Ballast	Wangford R.D.C.	F. S. Rix, Clerk, Beccles	do.
Tramp Cais at Workhouse	North Eastern Railway Co.	E. H. Clark, Stores Superintendent, Gateshead	do.
Road Materials	do.	do.	do.
Railway Sleepers-blocks and Crossing-sleepers	Wath-upon-Deane U.D.C.	H. C. Poole, Surveyor, Town Hall, Wath-upon-Deane	do.
Fence Posts and Rails	Manchester Paving, etc., Committee ..	City-Surveyor's Office, Town Hall, Manchester	do.
Road Material	Oxendon R.D.C.	C. Burghole, Clerk, Market Harborough	do.
Underground Telephone Pipes	Trustees, Mendesham Charities	H. G. Bishop, Architect, Market-place, Stowmarket	do.
Granite	Hunts C.C.	H. Leete, County Surveyor, County Council Office, Banbury	do.
Blacksmith's Shop, Mendesham	Maclesfield Education Authority ..	Secretary of Education Committee, Town Hall, Maclesfield	Mar. 1
Main Road Material	Altrincham U.D.C.	J. Stokoe, Clerk, Altrincham	do.
Painting and Repairs of Technical School, etc.	Secretary of State for India	Director-General of Stores, India Office, Whitehall	do.
Making Finchley-road, Altrincham	do.	do.	do.
Rails and Fish-plates	Great Central Railway Co.	J. Hartley, Architect, Skipton	do.
Wheels and Axles for Carriages	B'ham. Public Works Committee ..	O. S. Holt, Secretary, London-road Station, Manchester	do.
Detached Residence at Settle	Birmingham Corporation	J. Price, City Surveyor, Council House, Birmingham	do.
Stores and Materials	East Barnet Valley U.D.C.	H. York, Surveyor, Council Offices, Station-road, New Barnet ..	do.
Tram Rails	Salford Baths Committee	General Superintendent, Blackfriars-road Baths, Salford	do.
Extension of Drummond-road and New Road	Market Bosworth R.D.C.	Surveyor to the Committee, Town Hall, Twickenham	do.
Making-up Roads, Tar-paving Footways	Manchester Corporation	E. Z. Thornton, Secretary, 45, Queen Anne's-gate, S.W.	do.
Painting Regent-road and Broughton Baths	Southern Mahatma Railway Co.	W. Sinclair, Clerk, Poor Law Office, Leaburn	do.
Broken Granite	Heston and Isleworth U.D.C.	P. G. Parkman, Engineer, Town Hall, Hounslow, W.	do.
Materials (Withington Committee)	do.	do.	do.
87 tons Paints, 35 tons Red and White Lead, etc.	Bradford Education Committee	Education Office (Architects' Department), Manor-row, Bradford ..	do.
Landry Equipment	Burial Board Committee	J. M. Davies, 11, The Green, Aberystwyth	Mar. 4
Making up Argyle-road, Hounslow	Aberystwyth Building Society	F. W. Pearce, Surveyor, Town Hall, Twickenham	do.
130 yds. of Stormwater Sewer, Staines-rd., Hounslow ..	Twickenham U.D.C.	J. Newton, Son, & Bayley, Engineers, 17, Cooper-st., Manchester ..	do.
Wood and Iron School Building	Altrincham Gas Co.	do.	do.
Plant House at Cemetery, Stafford	East India Railway Co.	C. W. Young, Secretary, Nicholas-lane, London, E.C.	do.
Twenty-five Houses at Aberystwyth	Market Bosworth R.D.C.	W. Thorpe, Highway Surveyor, Nailstone, Nuneaton	do.
Annual Contracts	Durham C.C.	County Surveyor's Office, Shire Hall, Durham	do.
45 tons of Steel Girder Rails	do.	W. Bell, Architect, Bradford and Keighley	do.
Laying 500 yds. of Railway along Moss-lane	North Eastern Railway Co.	W. Bell, Architect, Bradford and Keighley	do.
300,000 Dog Spikes	do.	C. A. Harrison, Engineer, Central Station, Newcastle-on-Tyne ..	do.
Team Labour	West Ham Guardians	Clerk's Office at Infirmary, Whips Cross-road, Leytonstone, N.E. ..	do.
Road Metal, Carriage, Haulage, etc.	do.	do.	do.
Baptist Sunday Schools at Farnley	Southampton Harbour Board	E. Cooper Poole, Engr., Harbour Office, Town Quay, Southampton ..	do.
Milk Depot at Northallerton	Glamorgan C.C.	T. M. Franklin, County Council Offices, Westgate-street, Cardiff ..	do.
Painting Station Buildings	Heston and Isleworth U.D.C.	do.	do.
Elco, Bells, Telephone, and Fire Alarms, Whips Cross ..	do.	P. G. Parkman, Engineer, Town Hall, Hounslow, W.	do.
Auxiliary Fire Hydrants, Infirmary, Whips Cross, N.E. ..	Fendon R.D.C.	E. K. Carmichael, C.E., 14, Queen-street, Edinburgh	do.
Ferro-Concrete Foundations for Cranes, Town Quay ..	Free Library Committee	J. A. Webb, Surveyor, Great Stannore	do.
Par-paving at Constance School, Skewen	East Stonehouse U.D.C.	A. E. Collins, City Engineer, Guildhall, Norwich	Mar. 9
Folding Partition & Lavatory at Penel-green School ..	Carlisle Corporation	A. E. Collins, City Engineer, Guildhall, Norwich	do.
Materials	Birmingham Corporation	H. C. Marks, City Engineer, 39, Fisher-street, Carlisle	do.
32 Concrete Block Houses, Aigish Farm, Stornoway ..	Penton U.D.C.	G. H. Barber, Sec., City Gas Offices, Council House, Birmingham ..	do.
Road Material and Works	Tamworth Town Council	A. Goodall, Surveyor, Town Hall, Penton	do.
Alterations, etc., Norwich Free Library	do.	F. E. G. Bradshaw, Borough Surveyor, 30, Aldersgate, Tamworth ..	do.
Barging Rubbish, etc., and Haulage, etc.	London C.C.	J. Witter, Architect, Elgin	do.
Stores and Materials	Market Harborough R.D.C.	Bruce Vaughan, Architect, Cardiff	do.
Stores, Gas Department	The Managers	Clerk to the Council, County Hall, Spring-gardens, S.W.	Mar. 13
Macadam	Selby U.D.C.	A. Eaton, Architect, 6, St. James-street, Derby	do.
Granite, etc.	Dorchester R.D.C.	P. Griffith, Engineer, 64, Parliament-street, Westminster, S.W.	do.
Block of Workmen's Houses, Elgin	Salford Guardians	F. H. Folkinghorne, Surveyor, 2, Dagmar-road, Dorchester	do.
Additions, South Steam Laundry, Cardiff	The Guardians	Steward of the Infirmary	do.
*Cast-Iron Fire Alarms, etc.	Admiralty	A. J. Harris, Clerk, Queen's-chambers, Cardiff	do.
Granite	do.	J. Roberts, M.E., Fisher-street, Swansea	do.
Alterations, etc., to Council Schools, Ewell	Edinburgh School Board	Superintendent Engr., H.M. Naval Estab., Rosyth, Inverleithing ..	do.
Boring, 400 ft. deep	Perth Town Council	Mr. Cairns, Architect, 3, Queen-street, Edinburgh	Mar. 11
Repair of Roads	Brighouse Corporation	G. P. K. Young, A.R.L.B.A., 42, Tay-street, Perth	do.
Whitewashing, Union Infirmary, Hope, near Eccles ..	Manchester Rivers Committee	S. S. Hayward, Borough Engineer, Municipal Offices, Brighouse ..	do.
Building Materials, etc., for Cardiff Workhouse ..	Bristol R.D.C.	Rivers Department, Town Hall, Manchester	do.
*Additions, South Steam Laundry, Cardiff	Coventry Corporation	F. G. Herbert, Surveyor, 37, Alexandra-road, Stafford	do.
*Royal Naval Reserve Buildings at Banff	Uxbridge U.D.C.	T. H. Yabbicom, City Engineer, 63, Queen-square, Bristol	do.
Drummond-street School	Chamber of Trade Building Club ..	F. A. Swindling, City Engineer, 41, Coventry's Hall, Coventry ..	do.
Isolation Hospital at Friarton, Perth	Portrush U.D.C.	F. S. Courtney, Engineer, 26, Victoria-street, Westminster	do.
Masonry and Street Work, Calder Bridge Widening ..	Very Rev. V. Byrne	W. Beddoe Rees, Architect, 3, Darnley-place, Cardiff	do.
Laboratory at Withington Sewage Works, Chorlton ..	Hastings Town Council	Slevin & Son, Surveyors, 18, Dame-street, Dublin	do.
Team Labour	Southampton Corporation	J. S. Green, Borough Surveyor, Municipal Offices, Hastings	do.
Painting Works at Ham Green Hospital	Penistone U.D.C.	H. Hulke, Borough Surveyor, Town Hall, Droitwich	do.
Materials	Yardley R.D.C.	Train Manager, Tramway Office, Above Bar-street, Southampton ..	do.
Pumps, Engines, and Boilers	do.	Spinks & Filling, Engineers, 20, Park-row, Leeds	do.
Twenty-eight Houses, Park Hill, Trudering	Axbridge U.D.C.	A. W. Smith, Engineer, Council House, Sparkhill, Birmingham ..	do.
Sand Filter, etc., at Waterworks, Portrush	do.	do.	do.
Church, Salinas, Co. Kildare	Berkshire C.C.	Messrs. Crews & Son, Rolle-street, Exmouth	Mar. 15
Materials	Stockport Corporation	A. Powell, Engineer, 3, Unity-street, College Green, Bristol	do.
Stores, Fittings, etc.	Lichfield R.D.C.	J. F. Hawkins, County Surveyor, Bank-chmrs., Cross-st., Reading ..	do.
Penistone Sewage Scheme (Contract No. 4)	do.	Atkinson, Borough Surveyor, Stockport	do.
Materials	Calodonian Railway Co.	C. O. Rawstorn, District Surveyor, Lichfield	do.
Sewage of Apollo's Green, South-East	Stirlingshire Eastern District Com. ..	do.	do.
Four Houses at Malnhead-view, Exmouth	Wokingham R.D.C.	Engineer, General Station, Perth	do.
9 miles of Water Pipes, Highbridge Water Supply ..	Manchester Rivers Committee	Warren & Shute, C.E., 91, Hope-street, Glasgow	do.
Reservoir and Contingent Works	Liverpool Select Vestry	R. Hassard, Engineer, 1, Victoria-street, Westminster, London ..	do.
Tools	do.	C. H. Fry, Clerk, Council Offices, Bexley-road, Brixton	do.
Permanent Way Works (Tramways)	do.	Secretary of Rivers Department, Town Hall, Manchester	do.
Granite	do.	H. J. Hagger, Parish Offices, Brownlow Hill, Liverpool	do.
Tools, Oil, etc.	do.	do.	do.
Renewal of Superstructure of Four Under Bridges ..	do.	do.	do.
Bonnybridge Sewage Disposal	do.	do.	do.
Wargrave Sewage Disposal	do.	do.	do.
Materials	do.	do.	do.
600 tons of Cement	do.	do.	do.
Jobbing Repairs, Workhouse, Brownlow Hill	do.	do.	do.

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered
Engine House, etc., at Matton, near Cromer.	Cromer U.D.C.	J. C. Mellis, Engineer, 284, Gresham House, Old Broad-street, E.C.	Mar. 18
Master's Quarters, Enfield and Willenden.	Middlesex C.C.	County Architect, Middlesex Guildhall, Westminster, S.W.	do.
Postoffice Station Offices at Whitby.	Caledonian Railway Co.	Engineer to Company, 16 Killermont-street, Glasgow	do.
Three Workmen's Dwellings, Manor-grave.	Richmond Town Council.	J. H. Brierley, Borough Surveyor, Town Hall, Richmond, Surrey	do.
Carriage Underframes and Body Iron Work.	Secretary of State for India	Director-General of Stores, India Office, Whitehall	do.
Materials.	Hampton U.D.C.	S. H. Chambers, Surveyor, Public Offices, Hampton, Middlesex.	Mar. 14
Branch Library at Castleton.	Rockdale Libraries Committee	J. Horsfall, F.R.I.B.A., 4, Chapel-walks, Manchester	do.
Extension of Gas Mains to Wrexlesham.	Farnham Gas Co., Ltd.	Company's Offices, East-street, Farnham	do.
Completion of a Covered Conduit.	Liverpool Water Committee	Water Engineer's Office, Municipal-buildings, Liverpool	do.
Materials.	Sutton Coldfield Corporation	W. A. H. Clarry, Borough Engineer, Council House, Sutton Coldfield	do.
Addition, etc., to "Nazareth" Chapel, Aberdare.	Wembley U.D.C.	T. Roderick, Architect, Ashbrook House, Clifton-street, Aberdare	do.
Materials.	do.	W. Bagshaw, Clerk, Public Offices, Wembley	do.
Broken Granite Gravel, Foggan.	Long Crendon R.D.C.	E. Parry, Surveyor, Long Crendon, Thame	do.
Rebuilding the Kiboroy Mills, Triangle, Halifax.	Trustees of the late G. E. Hadwen	Jackson & Fox, Architects, 7, Rawson-street, Halifax	Mar. 15
2½ yds. of Stoneware Sewers and Manholes.	Leadbury Freehold Building Society.	R. G. Gurney, Surveyor, Worcester-road, Leadbury	do.
Road from Byre-street to Ostley's-lane.	do.	do.	do.
Road Materials and Carting.	Tutbury R.D.C.	C. F. Chamberlin, Clerk, Council Offices, Union Offices, Burton-on-T.	do.
Resurfacing and Additions, Parish Church, Llanelly.	Rev. D. W. Morgan	E. M. Bruce-Vaughan, F.R.I.B.A., Cardiff	do.
Hospital, Gt. Gressnock.	Greenock Hospital Board	C. Macdonlock, Clerk, Municipal-buildings, Greenock	do.
School for 800, Canton Market Estate.	Cardiff Education Committee	James & Morgan, Architects, Charles-street-chambers, Cardiff	do.
Road Materials.	Blackpool Highways Committee	J. S. Brodie, Borough Engineer, Town Hall, Blackpool	do.
Material.	Eastbourne R.D.C.	T. E. V. Kirlian, Clerk, 92, Terminus-road, Eastbourne	Mar. 16
Swish Bricks, Deal, Rich Place and Telling Boards.	Lambeth Borough Council	Borough Engineer, 346, Kennington-road, S.E.	do.
Materials.	Godstone R.D.C.	J. George Powell, Engineer, B.D.C. Offices, Godstone, Surrey	Mar. 17
New Royal Naval Reserve Buildings, Portree.	Admiralty	Director of Works Department, 21, Northumberland-avenue, W.C.	do.
Widening Warstead Gait Bridge, Wotley.	West Riding C.C.	F. G. Carpenter, County Surveyor, County Hall, Wakefield	Mar. 18
Rebuilding Barishand Mill Bridge, near Halifax.	do.	do.	do.
Materials.	Burnley Highways Committee	G. H. Pickles, Borough Engineer, Town Hall, Burnley	do.
Stones.	Epsom U.D.C.	Surveyor's Office, Bromley Hurst, Church-street, Epsom	do.
Two Cottages for Firemen.	Beckenham U.D.C.	Council's Surveyor, Beckenham	Mar. 20
Water Sewing Works at Pumping Station.	Sutton District Water Company	W. Yaux Graham, Engineer, 5, Queen Anne's-gate, Westminster	do.
Bridge at Chipping Norton Junction.	Great Western Railway Co.	Engineer, Paddington Station, London	Mar. 21
Reconstruction of a Bridge at King's Sutton.	do.	do.	do.
Plans.	Tending R.D.C.	J. Bell, Highway Surveyor, Wesley, Colchester	do.
Extension of Harbour.	Stonehaven Harbour Trustees	D. B. Cunningham, Clerk to Trustees, Stonehaven	do.
Rebuilt detached Villas, Station Field, Pontypool.	County of Kent	J. J. Longher, Architect, Bank-chambers, Pontypool	do.
Shed and Cabinet-makers Work, etc., Crown Court.	Leeds Corporation	County Architect, 85, West-street, Maidstone	do.
Swamp Repeal Works, etc., Cain.	Wrexham R.D.C.	City Engineer's Office, Municipal-buildings, Leeds	Mar. 22
School, Gwernmawr, Llanbithel.	Abertillery U.D.C.	J. Price Evans, Engineer, Argyle-chambers, Wrexham	do.
Primitive Methodist School and Vestry, Westington.	Rev. M. S. Pickering	Swash & Baly, Architects, Midland Bank-chambers, Newport, Mon.	Mar. 23
Elementary School Buildings, Wimbome-road.	Pools Education Committee	Davidson & Phillips, Architects, 32, Clayton-st., W., Newc.-T.	Mar. 24
Derwent Aqueduct, Grindleford to Rowsley.	Derwent Valley Water Board.	W. Andrew, Architect, Parkstone	do.
68 tons of 8-in. Cast-Iron Pipes.	Welwyn (Herts) R.D.C.	E. Sandeman, Engineer, Bamford, near Sheffield	Mar. 27
Infection Diseases Hospital, Meadow Road, Alve.	Inverness-shire C.C.	H. Walker & Son, Engrs., Albion-chambers, King-st., Nottingham	do.
Wesleyan Chapel, Crossland Moor, Huddersfield.	do.	C. Ottensmarch, Architect, King-st., London, E.C.	Mar. 31
Wesleyan Chapel and Schools, Sandal, Wakefield.	do.	Agent-General for Victoria, 142, Queen Victoria-st., London, E.C.	No data
Road Formation, etc., Chester.	do.	W. J. Morley & Son, Architects, 269, Swan-arcade, Bradford	do.
Excavating a Reservoir, 30 yds.	do.	Garside & Pennington, Architects, Ropergate House, Pontefract	do.
Alterations to Llandaff House.	do.	J. Little, Engineer, Victoria-chambers, Carlisle	do.
Llandaff Theological College (1st Section).	do.	Agent & Manager, Istock Collieries, Ltd., near Leicester	do.
New Cotton Exchange, Liverpool.	do.	W. H. Dashwood Cople, Architect, Church-street-chambers, Cardiff	do.
		Mr. Kempson, 16, High-street, Cardiff	do.
		Metcalf & Simon, Century-buildings, North John-street, Liverpool	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Two Architects' Assistants.	Glamorgan C.C. Education Comm.	2l. 10s. per week	Mar. 7
*Clerk of Works.	Hull Corporation	3l. 10s. per week	Mar. 10
*Engineer to Public Health Department.	Corporation of London	1,000l.	Mar. 18

Those marked with an (*) are advertised in this number.

Competitions.—

Contracts, iv. vi. viii. x.

Public Appointments, xxi.

TENDERS.—Continued from page 251.

LLANIDLOE.—For erecting the five houses on Eborac-road for the Masseneux Building Co., Ltd. Mr. Du Lloyd, architect:—
David Lewis, Aberbeeg £7,000

LONDON.—For finishing of roadways of Section A, White Hart-line Estate, for the London County Council:—
2 Adams £3,157 18 6
W. Manders 22,872 10 7
H. B. Gibbons 2,827 0 0
O. T. Gibbons 2,827 0 0
G. J. Coxhead 2,760 0 0
Mathews 3,036 16 4
J. Moulton 2,087 18 6
Co., Ltd. 2,968 0 0
E. J. Taitton Rope-yard,
H. T. Bloom 2,930 5 8
Laughedg-
W. Griffiths 2,875 2 8
lana, E. d-
& Co., Ltd. 2,407 12 1
[The estimate comparable with the tender is £2,038.]

LONDON.—For the erection of two shops, Lea Bridge-road, London, N.E. Mr. Herbert Riches, architect, 5, Grosvenor-lane, King William-street, London, E.C. Quantities supplied:—
Courtney & Co. £3,070 10
Pollock & Newman 3,038 0 0
P. & T. Thorne 2,939 0 0
Bulley, Sons, & Sheffield Bros. 2,950 0
Robins 3,130 0

LONDON EDUCATION COMMITTEE TENDERS.

Reconstructing the heating apparatus and extending it to the new classrooms and halls, Clapham, Stafford-street (heating apparatus):—
Wright Bros. £684 10
O. N. Haden 650 0
S. J. Haden 648 0
W. G. Cannon 599 0
[Alternative tender.]

Slapney, Senrab-street (New School).

Under the direction of the late authorities preliminary plans of a school for 656 children were prepared, and have been approved by the Board of Education, the description of the plans being as under:—Accommodation: Boys, 274; girls, 274; infants, 308; total, 856. Graded school on three stories:—Halls: Boys, 53 ft. by 28 ft. 9 in.; girls, 53 ft. by 28 ft. 4 in.; infants, 53 ft. by 28 ft. Classrooms: Boys, 50, 48, 48, 48, 40, 40; girls, 50, 48, 48, 48, 40, 40; infants, 56, 56, 50, 50 (babies' room), 48, 48. Drawing classroom, 504 sq. ft. area; science room, 504 sq. ft. area. Heating by low-pressure hot-water apparatus and open fires. Area of site, 41,155 sq. ft. Playgrounds, area per child—boys, 53 sq. ft.; girls' and infants', 32 sq. ft. It is proposed that one of the houses adjoining the site shall be used for the accommodation of the schoolkeeper.

T. Rowbotham 22,575 0 0
Sabey & Son 23,815 0 0
J. Shelbourne & Co. 22,670 0 0
A. E. Symes 22,461 10 4
W. J. Jackson & Co., Ltd. 22,417 0 0
E. Lawrence & Sons 22,185 0 0
B. E. Nightingale 21,971 0 0
Higgs & Hill, Ltd. 21,963 0 0
J. Appleby & Sons 21,712 4 0
J. Garrett & Son 21,730 0 0
Stimpson & Co. 21,700 0 0
Wisdom Bros. 21,681 0 0
Treasure & Son 21,674 0 0
Martin, Wells, & Co., Ltd. 21,346 0 0
F. & T. Thorne 21,273 0 0
J. Smith & Sons, Ltd. 21,198 0 0
Rowley Bros. 21,172 12 0
Oak Building Co., Ltd. 20,899 0 0
J. M. Patrick, Point-pleasant, Wandsworth* 20,662 0 0

[The architect's estimate comparable with these tenders is £18,928. The school is planned for future extension by 332 places (viz., boys', 108; girls', 108; infants', 116, making a total of 1,188), and the tenders for the portion now to be built include the provision of halls of sufficient size for the school when enlarged, and also teachers' rooms, cloakrooms, lavatories, etc., for the complete school.]

LONDON.—For alterations and additions to the receiving wards and stables at the Brompton Workhouse, Ladywell, S.E., for the Brompton Guardians. Messrs. Newman & Newman, architects, 31, Tooley-street, S.E.:—
W. Benson, 47, Rosebery-avenue, E.C. £299

NORWICH.—For kerbing, channelling, metalling, etc., Winter-road and part of Stafford-street, for Messrs. Winter, Messrs. Morgan & Buckingham, surveyors. Quantities by surveyors:—
H. S. Watling £210 0 0
W. J. Hipperston £780 12 6
E. Hovos 701 18 8
G. Rackham 986 0 0
W. J. Hannant 788 0 0
E. J. Edwards 904 0 0
[All of Norwich.]
[Estimated cost £700.]

PLAISTOW.—For the extension of Public Baths Balasam-street, for the West Ham Corporation:—
H. C. Horswill 23,063
Works Manager,
J. G. Horlock 2,968
Canning Town* 22,456
A. E. Symes 2,550
A. G. Crisp 2,440
Gregor & Son 2,480
W. Manders 2,425

PLYMPTON (Sussex).—For making up road, etc., at Sedgbrook, for the East Sussex Western Smallpox Hospital District Committee. Mr. Macarthur, surveyor, Hayward's Heath. Quantities by surveyor:—
E. H. King £188 3
W. Knight, jun. £173 0
S. Carey 180 0
S. Packham, Bur-
C. Mayo 178 7
gess Hill* 165 0

STRATFORD.—For making-up Totnes-road and Charford-road, for the Borough Council:—
D. T. Jackson £272 12 8
J. Jackson £904 9 6
Hewitt & Sons 958 12 8
G. J. Anderson 835 9 2
T. Adams 959 9 2
Parsons & Par-
W. Griffiths 935 0 6
sons, Ilford* 779 19 7

STRATFORD.—For alterations to prisoners' cells, Quarter Session Court, West Ham-lane, for the Borough Council:—
G. H. Horswill £268
W. Manders £250
A. E. Symes, Strat-
ford* £210
J. Quarterman 293
H. C. Horswill 284

TOTTENHAM.—For making-up Crowland-road (2nd section), Kent-road, Lansdowne-road, and Woodside-gardens, for the Urban District Council. Mr. W. H. Prescott, Engineer, Coombes Croft House, 712, High-road, Tottenham:—

	Crowland-road (2nd section).	Kent-road (remainder).	Lansdowne-road (remainder).	Woodside-gardens (part of).
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
E. Knifton	522 9 10	138 18 4	1,441 8 9	244 13 4
Grondes & Newton, Tottenham ..	436 17 0	126 2 6	1,298 0 3*	204 1 4
T. Rowley, Junr.	—	—	1,414 14 2	234 12 3
C. Bloomfield, Tottenham	439 12 6	120 7 7*	1,339 0 0	213 4 0
B. T. Bloomfield, Tottenham	368 12 0*	122 13 6	1,301 17 0	207 0 6½*

ST. STEPHEN'S-BY-SALTASH.—For laying sewer for the St. Germans Rural District Council. Mr. S. P. Hosking, surveyor, Landrake, St. Germans:—
A. Smith, Saltash

	£ s. d.	Hardy & Atkinson ..	£ s. d.
SALTHERN-BY-THE-SEA. —For making-up private streets, for the Urban District Council. Mr. G. S. L. Bains, C.E., Surveyor:—		Burn	3,467 13 10
Asphaltic		Inglert	3,432 2 0
Limestone		Shepherd	3,428 9 8
Concrete		Pinkering	3,352 2 4
Co., Ltd.	5,521 14 10	North of	
Starkey	5,139 19 10	England	
Hunt	4,519 15 7	Asphalte	
Hadfield		Co.	3,311 9 10
Co.	4,814 4 9	Hobbs	3,293 6 9
Robson	4,788 8 6	O'Doherty & Son	2,950 2 0
Crombie & Son	4,521 1 9	Ellison	
Smiles	4,402 6 3	Cleekhea	
Cruidas & Son	3,954 8 5	ton*	2,944 12 10
Short	3,814 17 11		
Simpson	3,697 2 5		
Meredith	3,603 19 4		

STANLEY.—For laying sewers, West Shield-road and East Stanley, for the Urban District Council. Mr. J. Routledge, Surveyor, Council Offices, Stanley:—

	£ s. d.	West Shield-road ..	£ s. d.
J. Meredith	2,569 3 6	East Stanley ..	
D. Champney	618 2 0		2,104 17 6
J. Robson	490 2 0		375 13 4
W. Carr	527 19 8		323 0 0
J. Thompson	479 5 2		343 0 10
P. Frater	532 18 6		310 11 10
J. McLaren	557 10 0		354 18 0
A. & A. Storey	612 14 6		353 17 6
A. Routledge	518 14 0		424 4 0
J. Nevin	513 5 0		344 5 0
W. J. Edgar	610 17 0		366 12 6
Johnson & Strong ..			447 5 0
Stanley, R.S.O.* ..	456 3 0		305 8 4
R. Hudson	607 0 2		382 16 8
W. Ayton & Sons	511 16 10		344 16 8
W. Johnson, Jr.	530 1 6		367 5 0

TOTTENHAM.—For erecting refreshment pavilions and dressing and store-rooms, Bruce Castle, Downhills and the Chestnuts Parks, for the Urban District Council. Mr. W. H. Prescott, Engineer, Coombes Croft House, 712, High-road, Tottenham:—

	£ s. d.	Pollard & Brand ..	£ s. d.
S. Kind	21,450 0 0		21,310 0 0
Boulton	1,452 6 4		1,310 4 11
Paul	1,341 0 0		1,155 0 0
	1,341 16 0	A. Porter	1,158 8 6

NOTE.—The second line of figures denotes alteration in quantities after being checked by engineer's department.

[No tender accepted. Council agreed to carry out the work in their own works department.]

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M. Wells & Co. 28,853
Rowley Bros. 27,800
C. Wall, Ltd. 27,554
C. Roper

WALTHAMSTOW.—For heating apparatus, Warwick-road Schools, for the Walthamstow Education Committee. Mr. H. Prosser, Architect to the Committee:—
Korting Bros. £723 0
J. Grundy

WIDNES.—For the enlargement of Stimm's Cross Council School, for Widnes Education Committee. Mr. F. U. Holme, architect, Westminster-chambers, 1, Crosshall-street, Liverpool:—
Jones & Son

W. H. Lascelles & Co.

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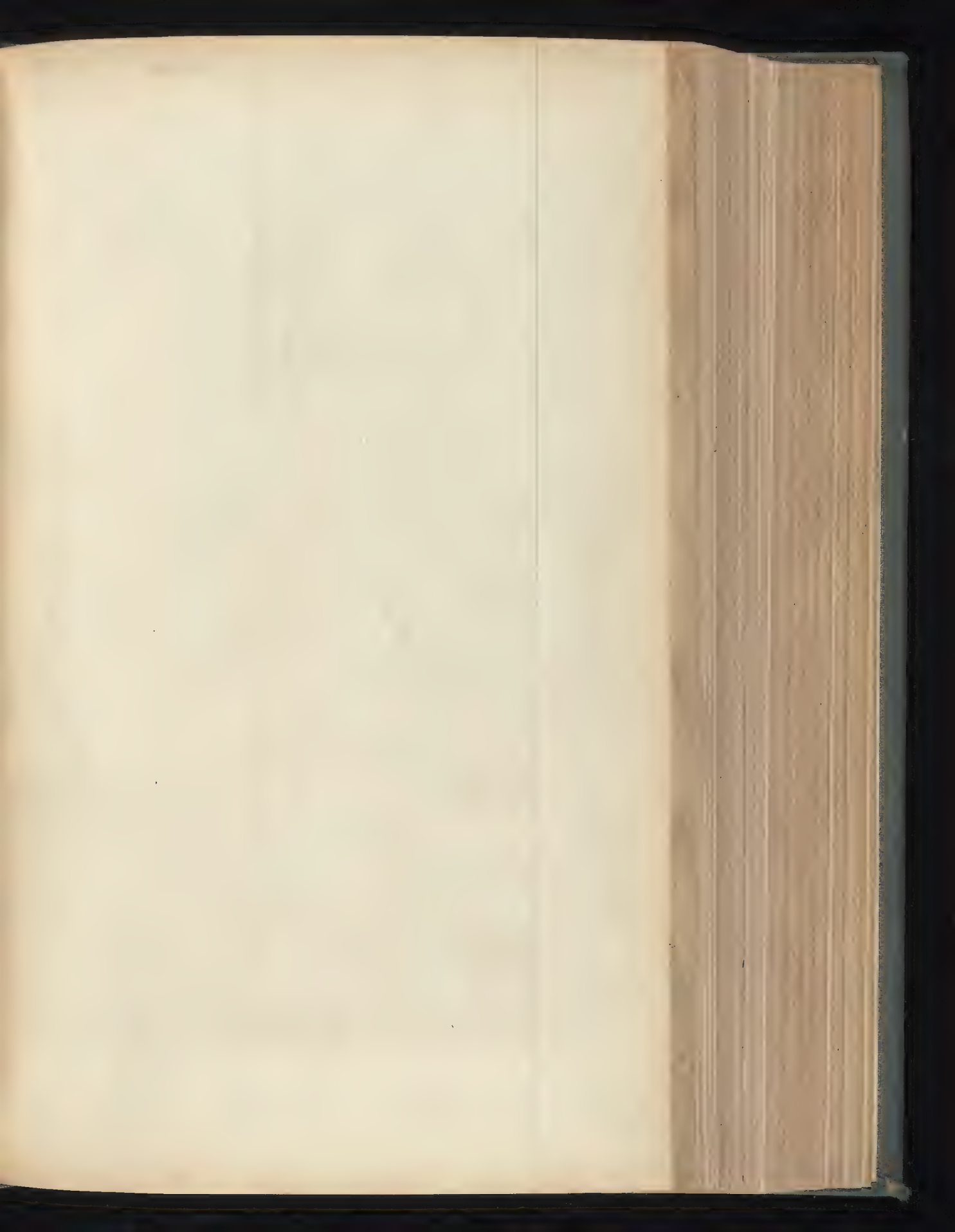
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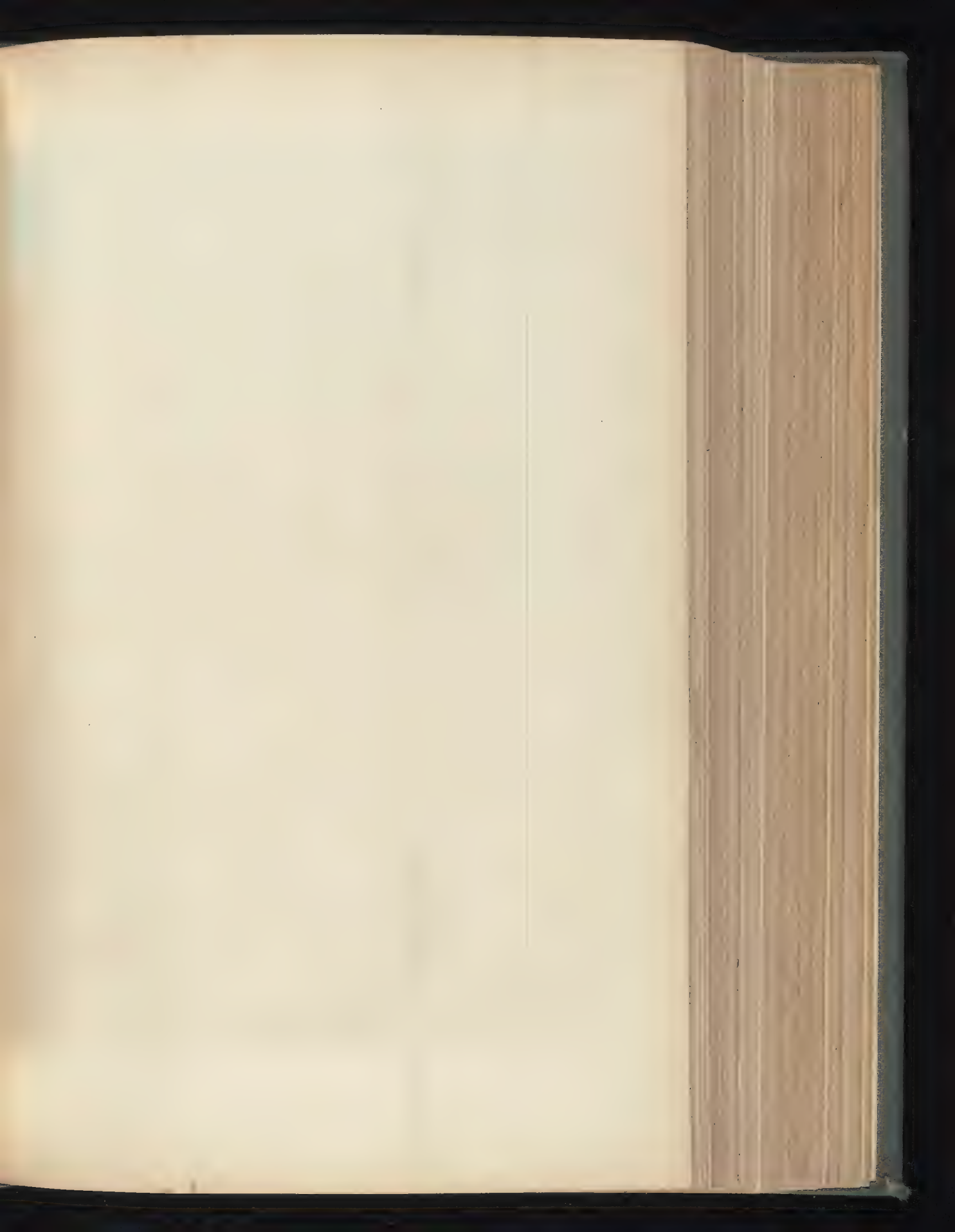
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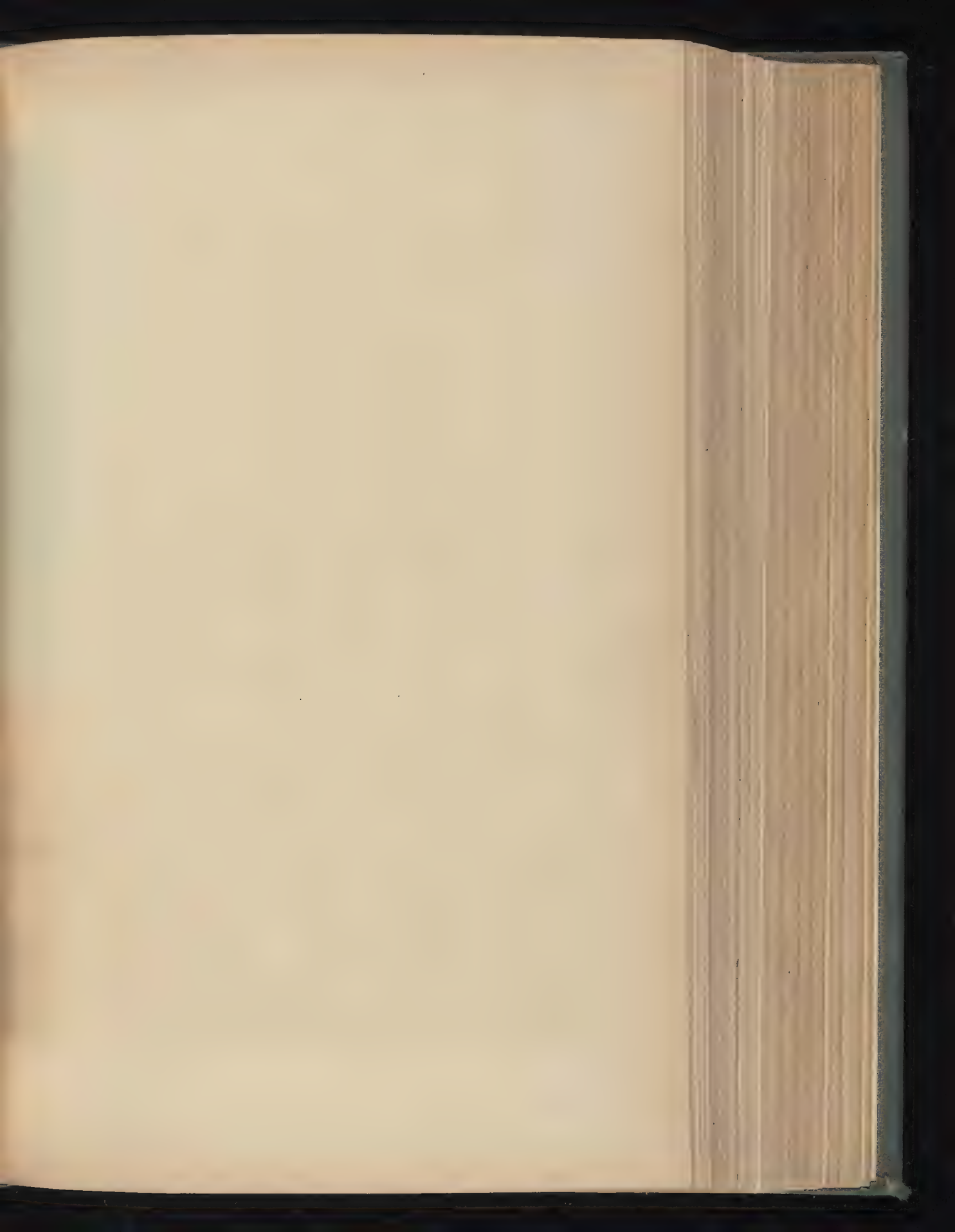


THE PROPYLAEA, ATHENS. FRONT. DRAWING BY MR. K. PHILIP SPERS, F.R.I.B.A.



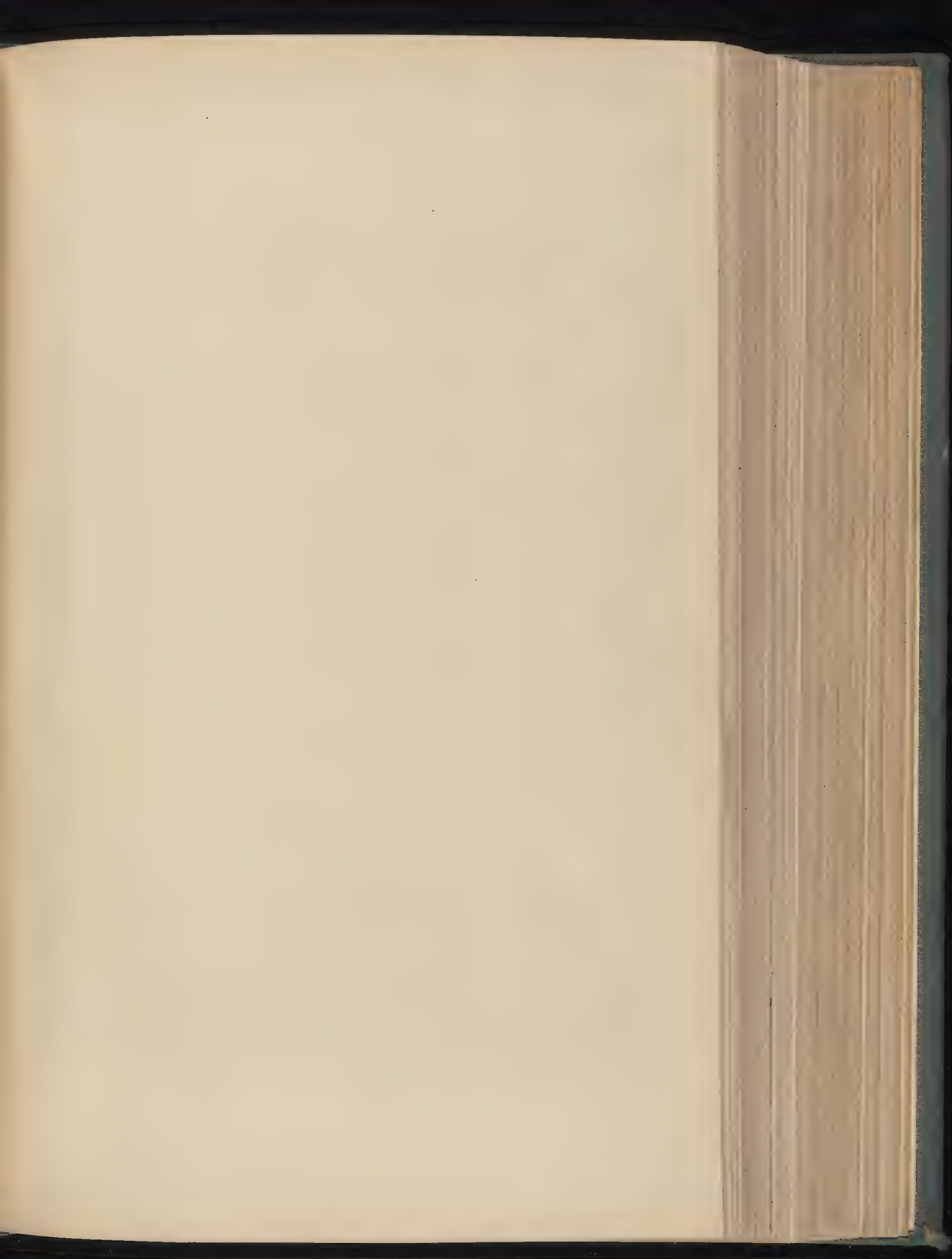


TEMPLE OF JUPITER, BAALBEK —FROM A DRAWING BY MR. R. PHENÉ SPIERS, F.R.I.B.A



TO
RICHARD PHENEAS
SPIERS,

ARCHITECT; Master of the Architectural School of the Royal Academy of Arts; Fellow of the Royal Institute of British Architects; Fellow of the Society of Antiquaries; Member and Past-President of the Architectural Association, London; Member of Council of the Japan Society; Member of the Hellenic Society; Associate and Honorary Fellow of King's College, London; Honorary Corresponding Member of the "Société Centrale des Architectes," Paris, and of the "Sociedad de los Arquitectos," Madrid; Gold Medallist, Scholar and Travelling Student of the Royal Academy of Arts; Soane Medallist and Travelling Student of the Royal Institute of British Architects; &c., &c.: Author of "Architectural Drawing," & "The Orders of Architecture;" Joint Author of "The Architecture of Greece and Rome;" Editor of a new

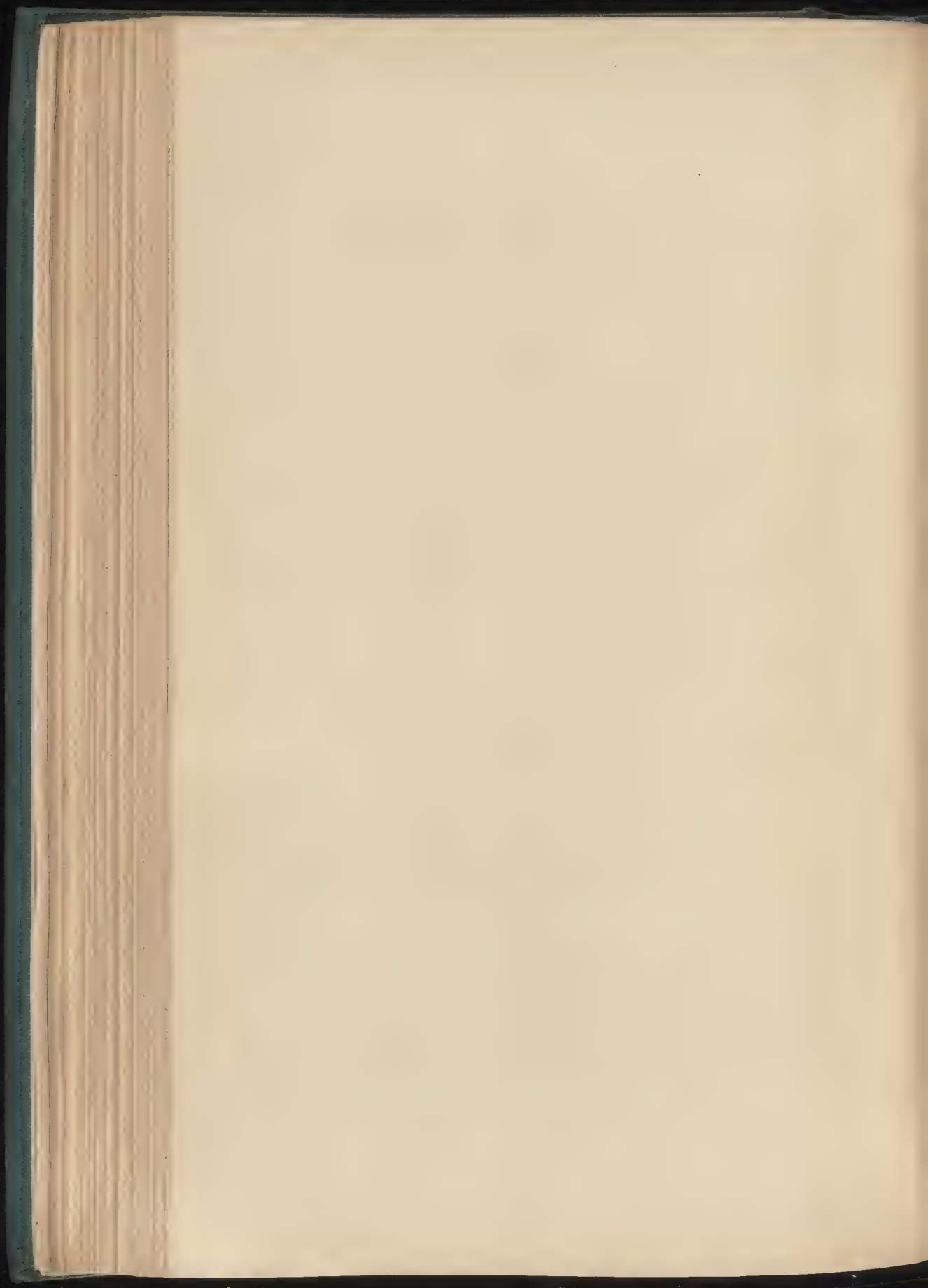





INTERIOR OF THE HALL OF COLUMNS, ESNEH.—FROM A DRAWING BY MR. R. PHENÉ SPIERS, F.R.I.B.A.



THE HALL OF COLUMNS, KARNAC—FROM A DRAWING BY MR R PHENÉ SPIERS, F.R.I.B.A.




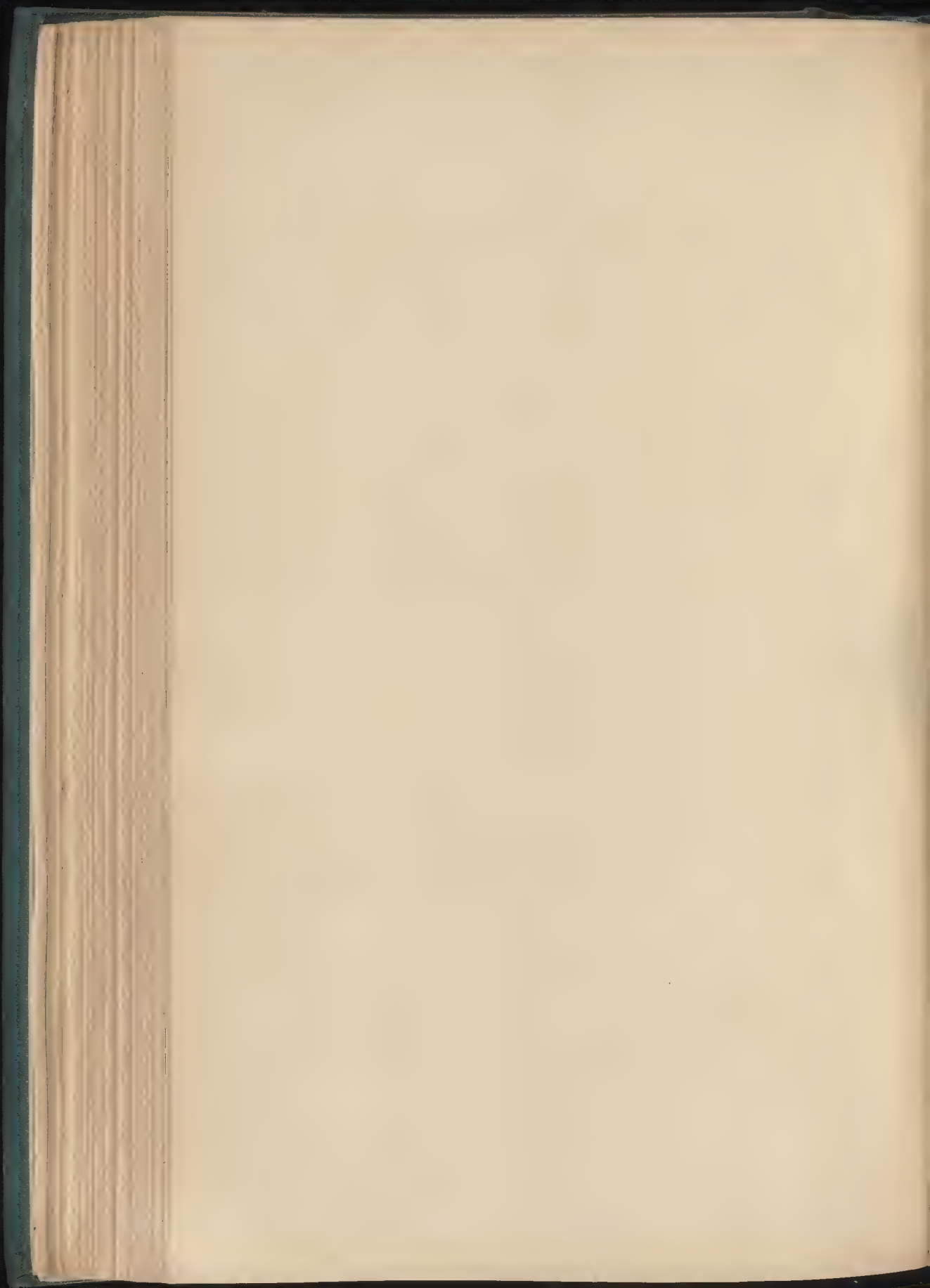
1905



edition of Fergusson's "History of Architecture in all Countries;" and Author of Architectural and Archaeological Essays on "Pierrefonds," "Sassanian Architecture," "Dorned Churches in Perigord," "The Mosque at Damascus," and other subjects.

WE, THE UNDERSIGNED ARCHITECTS, Students of Architecture, and Workers in the Arts, desire to give expression to our regard for you, and to mark our appreciation of your scholarly attainments, and of the good work which you have done in forwarding the study of Architecture during many years, in the course of which you have not only won distinction for yourself, but have done so much to help others. We also desire to record our acknowledgment of your labours in the cause of Architectural Education, and of the hearty aid which you have always been so ready to afford as a friend & counsellor. Many of us gratefully remember the kindness of your welcome, your constant sympathy and your interest in our student life & subsequent work.





The Builder.

VOL. LXXXVIII.—No. 5240.

MARCH 11, 1905.

ILLUSTRATIONS.

Ceiling, Palazzo Imperiale, Genoa	} Measured and Drawn by Mr. Harry Morley.
Measured Drawings, Palazzo Imperiale, Genoa	
A Pair of Houses	Messrs. Freeman & Ogilvy, Architects.
House at Rugby	Mr. J. W. Simpson, F.R.I.B.A., Architect.

Illustrations in Text.

Notes and Sketches in Southern Italy.—VII. :—	Notes and Sketches in Southern Italy (contd.) :—
Eastern End of Cathedral, Giovenazzo	Central Door of West Front, Cathedral Ruvo
Door of Ancient Cathedral Oratory of the	House at Rugby. Plan
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Notes and Sketches in Southern Italy.—VII.	House at Rugby	Sanitary and Engineering News
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The London Master Builders' Association	The London Building Act (Amendment) Bill	Patents
Architectural Societies	"Structural Timber Tests"	Some Recent Siles
Fifty Years Ago	Wallace Competition	Meetings
Competitions	The Student's Column	Prices Current
	Court of Common Council	Tenders

The Beginnings of Hebrew Architecture.



IBLICAL archaeology, even in its architectural aspect, is a study which does not concern any large circle of readers, and it is perhaps hardly likely that a book on the Hebrew Tabernacle will meet with the attention that the subject really deserves. To the ordinary reader of Scripture it is quite enough to know as much about the portable temple of the Jews as can be gathered from the statements of the Book of Exodus, without any systematic attempt either to verify the measurements there given or to reconstruct in drawing or model the tent of worship. The architect, on the other hand, seeing in the Tabernacle no building but a mere curtained enclosure—a thing of ropes, sheets, and poles—hardly reckons to bring it within his ken. But in this attitude both parties are probably mistaken; for whether we are concerned with the Jewish religion as a historic process which intimately affects our modern civilisation, or whether we are interested in the very difficult inquiry that deals with the architecture of the Herodian epoch, the Tabernacle (which is the cradle of the one, and in a sense the nucleus of the other) cannot fail to have its importance for us.

Mr. Caldecott's book * deals with three

* "The Tabernacle: Its History and Structure." By the Rev. W. J. Shaw Caldecott. The Religious Tract Society, 1904.

subjects which are intimately connected with one another. He deals *imprimis*, though not in the first part of his book, with the reconstruction of the Tabernacle itself, and in so doing provides a result which is conspicuously at variance both with what he calls the Conventional Tabernacle and that with which we are familiar in the late James Fergusson's "Temples of the Jews." His other subjects are the size of the cubit and the nature of the remarkable ruin at Râmet-el-Khalil, which has been for many a year a puzzle to archaeologists. To deal first and briefly with the outward aspect of the author's reconstructed Tabernacle, we may observe that he agrees with Fergusson in assuming that the cloth and skins of which the roof of the shrine was formed were stretched, not as the older commentators thought *horizontally* from wall to wall (a method which anyone who cared to make practical experiments with a sailcloth would find to be impossible), but dependent obliquely from a ridge pole. Oddly enough, however, Mr. Caldecott, though he admits this arrangement as the system of construction for the main body of the Tabernacle, assumes that the porch was covered on the other system—that is, with the canvas or curtain spread horizontally across the roof poles without any ridge or apex. The appearance of this square-topped canopy—contrasting with the angular form of the main roof—is, we consider, enough to condemn it as inadmissible. Authorities, as it happens, differ on the question whether there was a projecting porch in

front of the Tabernacle proper. Neither the Book of Exodus nor the Antiquities of Josephus are quite clear on the point, and it will be remembered that Fergusson adopted the view that the columns described as forming the porch were to be arranged not as a projecting portico, but merely as a sort of colonnade along the line of the entrance. Be this as it may, there is at least one sentence in Josephus which surely disposes of the idea that the arrangement of curtains at the entrance could have taken any other form than that of a gable end; the result of a ridge and two slopes. "The coverings," says Josephus (one may improve a little on Whiston's translation), "afforded at the doorway the appearance of a pediment (*ἀέτωμα*) and a façade (*πρόστας*)." It is difficult to understand how Mr. Caldecott can ignore this passage.

Just as in the attempts to reconstruct Herod's Temple we have to rely on two written evidences—that of Josephus and that of the Talmud; so in any attempt to work out the Tabernacle we are forced to take Josephus and the book of Exodus together, allowing the one to supplement the gaps of the other. We know, for example, from Exodus that the walls of the Tabernacle were formed of vertical boards closely fitted together. Josephus, though he gives the dimensions of these boards—dimensions which fit very well with the Mosaic figures—obscures his lucidity by calling them columns; using, in fact, the same word as that by which he describes the columns of the porch and the columns of the outward enclosure.

Probably no historian has ever described buildings with such apparent accuracy of dimensions as has been liberally used by Josephus in his records of the Tabernacle and the temples of the Jews. Yet anyone who has a mind to reconstruct from written description the simplest of these—the Tabernacle—will soon discover that he has before him a task that offers more than one inexplicable difficulty.

It is time, however, to put on record Mr. Caldecott's dealings with the cubit. The consensus of modern archaeological opinion has recently agreed (with some few dissentients) on 18 in. as the probable size of the ordinary builder's cubit in use by the Jews. It has, of course, long been known that more than one cubit was recognised. Fergusson acknowledged this in 1878, and gave their respective dimensions as 15 in. (a cubit used for metal work and vessels), 18 in. for the builder's cubit, and 21 in. for the Babylonian cubit, which, according to some authorities, was brought back by the Jews after captivity and used in the building of the second Temple.

But Mr. Caldecott is, we believe, the originator of the cubit theory which his book sets forth. He takes his results from the Senkerek tablet, and from the incised block known as the Slab of Gudea. It is impossible here to transcribe Mr. Caldecott's process of proof. Indeed, very few of his readers will possess the necessary knowledge to check his reasoning, and it is fair to remark that Professor Sayce, who gives his general approval to the book in a special preface, withholds his blessing from the "mathematical calculations," which, he says, "must be left to the professed mathematician." But the result of the writer's research is the establishment once more of a variety of cubits which, though still three in number, are not the same that we knew thirty years ago. Mr. Caldecott's three are respectively $\frac{1}{16}$, $\frac{1}{10}$, and $\frac{1}{6}$ of the English foot. He confines the smallest, as did earlier writers, to small objects and gold tapestry work. The second he attributes to buildings, and the third to the measurement of areas only.

The immediate consequence of this assumption, that in any given building with enclosed spaces about it two cubits at least would be employed, is at once apparent. The spaces in all our restorations will be increased in relation to the blocks of building. This theory of a double system of mensuration (we do not say triple, because the smallest cubit does not affect the question of architectural restoration), interesting as it is in connexion with the Tabernacle, assumes far greater importance when considered in relation to the temples of Solomon and of Herod. Mr. Caldecott promises, in a footnote, to produce a restoration of these buildings on his new basis of measurement; and, in view of this prospect—the application of the new dual system to these buildings, over which the energies of restorers have so long been in conflict—our interest in his contributions to Biblical archaeology becomes chiefly anticipatory.

One foresees, of course, many difficulties, some advantages, and some confusions. Anyone who has attempted, for example, to harmonise the authoritative

figures of Josephus with the equally authoritative figures of the Book Middoth, and who has struggled to make the result of his compromise between these two fit the measurements of the Haram area, realises not only that it will be very convenient to take refuge, when the figures are too stubborn, in a change of cubit, but also that there are many parts of the Temple building, or even of the Tabernacle, of which it is almost impossible to determine whether they come under the category of areas or buildings. We gather, for instance, that in Mr. Caldecott's opinion the altar of the Tabernacle enclosure comes under "middle" cubit measurements, but that the "projecting portion of altar base" is measured by the large cubit. The surrounding fence of the Tabernacle enclosure was made of post and curtains. How were they measured? By the small cubit as curtains, or by the middle cubit as structure? Mr. Caldecott is obliged, in face of the statements of Exodus xxvi., to admit that they were measured by the large cubit identical with that which he assures us is reserved for the measurement of areas. This consideration of the constant difficulties in which the Jewish workmen must have been involved by the use of two simultaneous standards, the remarkable fact just mentioned that the boundary fence of the Tabernacle has to be measured as area, not as fabric or structure, and the absence in Josephus's intricate dimensions of the Temple buildings of any suggestion of a double meaning for the work $\pi\acute{\alpha}\chi\upsilon\varsigma$, are perhaps our strongest reasons for wishing to await further proof.

That needlework and jewellery should be measured by a cubit of a size differing from the cubit of the architect is no more surprising than the existence, side by side, of our two pounds—troy and avoirdupois; but that a mason should measure a courtyard with a rule 25 per cent. in excess of that which he applies to the buildings therein contained is unacceptable of belief until clearly proved.

The credentials which Mr. Caldecott offers for his view are two-fold. He relies, perhaps, chiefly on his forthcoming work dealing with Herod's Temple. At present he claims to have brought "into view from the uncertainties of speculation the first concrete result of a well-ascertained fact of metrological lore. The importance of this deliverance from the 'might-have-been' will," he says, "grow upon us as we proceed, and it will culminate in the demonstration of its correctness when we come to deal with the area on which stood the Temple of Herod." Till then the author bids us hold judgment in suspense.

But in his preface he explains that he went out to the Holy Land to seek in the Râmet enclosure a confirmation of the "newly-discovered Hebrew cubit," and we gather that the author considers his application of theory to fact as eminently satisfactory. The thickness of the walls, he tells us, is three building (i.e., middle) cubits, and the area is in terms of the large, or surveyor's, cubit. The People's Court in this area proved to be a square of 150 ft., which means that it was 100 cubits (large, size) each way, a dimension which is just twice that of

the Tabernacle Court, and may thus serve as a strong justification of the 18-in. cubit, which is not in dispute. But does the thickness of the walls confirm the smaller cubit? "They are given," says Mr. Caldecott (he does not appear to have measured them himself) "as 40 in. This was three building cubits of $1\frac{1}{2}$ ft." But it was not. Three building cubits of $1\frac{1}{2}$ make 43.2, not 40 inches.

It should be noted that the connexion of this enclosure at Er-Râmet (or Râmet-el-Khulil) is only indirect with the Tabernacle. It is concluded that the spot may be identified with the Ramah of Samuel, but this, though a place of great sanctity, was not a tabernacle site. After the settlement of the Children of Israel in Canaan, and before the building of Solomon's Temple, there were, as we know, several quasi-permanent sites for the Tabernacle (the history of these sites, a rather complicated one, is set forth by Mr. Caldecott), but Ramah, the Sanctuary in which Samuel anointed Saul, was merely a "High place"—a fenced area containing an altar. None the less should its dimensions possess a cardinal value in the eyes of temple students. A place of national sacrifice, and connected with the personality of Samuel, it is, in its way, likely no less than the Tabernacle to have influenced the permanent structures of later years; and whatever rules of sacred proportions applied to the one might, as appears to have been the case, have applied to the other.

Finally, to return once more to the variant cubit, which is really the theme of this volume, it must be admitted that Biblical evidence for a double standard of cubits is apparently to be found in those chapters of Ezekiel which contain, in a vision, the measurements of the reconstruction of the Temple. In this passage some of the parts of the building are seen to be measured with a reed "of six cubits long by the cubit and a hand breadth"—elsewhere described as a "full reed of six great cubits"—while others are simply described as being of so many cubits. But it is to be observed that in the first place these measurements with the reed are not by any means confined to courts, area, and open spaces, and that, secondly, there is absolutely nothing in the text of Ezekiel to prove that the prophet is not using the large cubit as his standard throughout. He employs no such expression as "small" cubit. Probably, therefore, the emphasis with which at the opening of his description he announces that the measuring rod was of six great cubits is simply intended as a statement that the greater standard is employed throughout. That the prophet specially mentions the use of the entire reed in the figuring of the longer dimensions of outer walls and the like is only natural. He has recourse to his greater but still commensurate unit—just as we should employ yards instead of feet. But Mr. Caldecott concludes that the mention of the reed implies a change of standard.

We are content to await for the author's forthcoming work for the final demonstration of a theory which at present does not seem to throw too clear a light upon the dark places of Israelite architecture.

NOTES.

The Proposed Shakespeare Memorial. The discussions in the papers on the proposed Shakespeare memorial for London form an amusing example of that dread and distrust of everything in the shape of art which characterises the English public and average English journalism. No sooner is such a memorial proposed than the cry arises on all sides—"Let us have something useful; a library, a theatre; anything rather than a work of art"; and writers in *Punch* and other publications indulge in sneers at our public statues of twenty, thirty, or fifty years ago, as examples of the horrors to be avoided. These people either have no perception in art, or they go about with their eyes shut; otherwise they would know that English sculpture now is a very different thing from what it was fifty, or even twenty years ago. A memorial to Shakespeare in London (with the idea of which we are entirely in sympathy) ought to be an occasion for combining the best architectural and sculptural art of the country in a grand monument, which should be to London what the Scott monument is to Edinburgh: for that monument, in spite of what we now see to be bad detail, is as a whole a great conception, of which Edinburgh may well be proud; and it is perfectly possible to do something of the kind, but a great deal finer, in London, if people would only think so, and not allow literary men and journalists, who do not know what they are talking about, to snuff away a great and splendid opportunity.

A Garden Suburb. A GARDEN suburb at Hampstead is a project worth striving for; but even if the project be successfully carried out, we fear it can have no material effect on the development of towns generally. An appeal has been made for funds to create a public company for the above purpose, which is to be partly of a business nature and partly philanthropic—a fair interest is to be paid on the capital. But this would scarcely satisfy the ordinary investor up and down England, and it is difficult also to be sure that when the shares of such a company change hands a continuity of ideals will exist. The truth is that public control can generally, and in the long run, be the very force to make suburbs healthy and pleasant. We wish the present project a successful career, but it is certain that, from a practical point of view, it can be a merely isolated and agreeable example to public authorities.

The Metric System. THERE can be no doubt that the metric system is almost as convenient as are logarithms to busy men who desire to perform calculations with a minimum expenditure of time. So far as its theoretical advantages are concerned, arguments in favour of the system are really superfluous. The only valid objection to its use, in connection with weights, measures, and money, is to be found in the temporary inconvenience and cost that would be unavoidably caused during the transitional stage of changing from anomalous but well-known units

prevailing in this country to the co-related series of units, but less familiar, almost universally employed on the Continent and largely used in other parts of the world. The Decimal Association has now issued a reply by Mr. J. H. van Biene to the arguments brought against the metric system by the late Mr. Herbert Spencer, in the pamphlet to which reference was made in our "Note" of last April.* As we doubted the utility of Mr. Spencer's pamphlet, so we doubt the utility of the present publication. It is purely controversial, and does not strike us as one likely to popularise the tenets of the Association in question. The subject is eminently one for practical proposals rather than for academic discussions, and advocates of the metric system would do well to devote their attention chiefly to consideration of the means best calculated to make the suggested change easy to those who will have to pay the cost of new appliances for measuring and weighing the goods they manufacture and sell.

Our Navigable Waterways. In a paper read before the Society of Engineers on Monday, and briefly reported in another column, Mr. B. H. Thwaite discussed "The Transport Possibilities of our Inland Navigable Waterways." This communication possesses two distinctive merits. It is short and practical. The advantages of a canal system are succinctly set forth, and the author shows not only that canals can be constructed at less than one-thirteenth the cost of railways, but that the cost of canal transport per ton-mile is one-tenth of the average cost on British railways. In the case of electrically-operated canals the cost of traction is little more than one-twentieth of the railway average. To purchase, standardise, and electrify the entire British canal system means an outlay of nearly 20 millions sterling, and while we agree with Mr. Thwaite that, if undertaken by the State, the result would be a splendid national asset, we have no hope that the Government will ever be persuaded to consider any such scheme. The constitution of trusts in different parts of the country—such as the trust proposed by the Worcester Chamber of Commerce—is the most practicable means of regenerating and further increasing the usefulness of our inland navigable waterways.

The Public and the Roads. THE question of the rights of the public to the roads was again before the Courts in the case of *Tilling v. Dick Kerr & Co., Ltd.*, in which the defendants were a firm of contractors who were employed by the London County Council to carry out the electrification of a portion of the South London Tramways, under the provisions of the Tramways and other Acts. The plaintiffs were suing for damages they had sustained in carrying on their omnibus traffic in consequence of the defendants having used rails the upper surface of which were not level with the road, in contravention of the Acts of Parliament Section 6 of the London County Tramway (Electrical Power) Act, 1900, provides that the London County Council, for the purpose

of working the tramways by electrical power, "may reconstruct or make such alterations of the tramways and may execute all such works on or in connexion therewith in, over, or under the streets or roads in which the same are laid as may be necessary for adapting the same to be so worked." The defendants contended they were protected by this section and also by the Public Authorities Protection Act, 1893, because the action was brought more than six months after the right of action accrued. The raised rails were used in connexion with a "turnout," or siding, which was constructed alongside the existing rails to enable the tramway traffic to be carried on during the process of reconstruction. The learned judge found as a fact that there was no negligence on the part of the defendants, but that the raised rails were an obstruction to the highway which caused damage to the plaintiffs, and this obstruction was not authorised by the Acts of Parliament, since, if necessary at all, it was adopted not to enable the reconstruction to be carried out, but to enable the traffic to be continuously maintained. As regards the second ground of defence, the Public Authorities Protection Act, the Court, following the case of the Kent County Council v. Folkestone Corporation, recently commented upon by us, held that the independent contractor is not within the protection of the Act, since he is not "a person acting in the execution of statutory or other public duties." The case emphasised the necessity for some change being effected in the law as laid down by the Public Authorities Protection Act. The position is most anomalous if the corporations are only under its protection as long as they carry out the work themselves, and it directly encourages municipal trading. We have, moreover, constantly put forward the contention that such a protective statute should apply to corporations only in the exercise of their administrative functions, and that such protection should not be extended to them in their new capacity of traders.

Ventilation of the House of Commons. THIS perennial subject is still receiving the attention of a Select Committee of the House of Commons. During the recess a new type of water screen and a more powerful intake fan have been installed, and steps have been taken to provide for the more complete isolation of the passages forming the main air-ducts. The larger exhaust fan recommended by the Select Committee will probably be running by the end of the present month. Experimental tests are then to be undertaken with the object of obtaining further information as to the distribution of air to the House, and as to the character of the air so distributed. The report recently presented by Dr. M. H. Gordon contains some useful but obvious suggestions for improving the quality of the air supply. It advocates, among other things, the enlargement of the air inlet and the abolition of traffic over it, the prohibition of traffic across the main air-duct while the House is sitting, and the regular use of wet mats in the heating chamber for the purpose of satisfying the increased capacity of the

* The Builder, Vol. lxxxvi, p. 357.

warmed air for moisture. One of the most important points is that the main duct should be made perfectly air-tight. At present three doors exist between the ventilating fan and the inlet, and unless these are blocked up or securely sealed the object of the most perfect air purification appliances will always be liable to be defeated. Though the House is not really so badly ventilated as some members of it pretend, it is extraordinary that its complete and efficient ventilation should still remain a kind of unsolved problem. The practice in the past has been to rely too much upon the assistance of medical men, and while fully recognising the value of their services, we feel convinced that the ventilation of the House can only be satisfactorily accomplished by placing the whole matter in the hands of a thoroughly competent heating and ventilating expert.

Wireless
Telegraphy.

MR. MARCONI gave an interesting lecture last week at the Royal Institution on "Recent Advances in Wireless Telegraphy." Although nothing very novel was described, yet from many incidental remarks it was obvious that the workers in the field of wireless telegraphy have made substantial progress during the last year. He explained how by timing receivers to respond only to signals of a particular frequency, it was now possible to receive several messages simultaneously at a wireless station. There is practically no interference in the ether between waves of different wave length. The magnetic detector has been brought to a high pitch of perfection. In the earlier form of apparatus which Mr. Marconi devised, the current impulse was so rapid that it failed to actuate the tongue of a relay, although it produced a sharp click in the telephone. In the present type of detector, mainly by choosing suitable iron and modifying the arrangement of the circuits, the impulse was made less rapid, and so, by actuating a relay, the message could be printed by a Morse recorder. High speed could be attained by this instrument. Between Amsterdam and Chelmsford the average speed was now twenty-four words per minute. The lecturer referred to the breakdown of the apparatus used to transmit wireless messages to the *Times* from America in the spring of 1903. New stations for this purpose were now in course of erection. Reference was made to the long distance news service between the shore and some of the Cunard liners. It was stated that messages were much more easily sent over long distances at night time or in cloudy weather. Mr. Marconi is confident that communication between England and her colonies can be made more economically by wireless telegraphy than by submarine cables.

The
Telephone
Settlement.

ACCORDING to the agreement made between the Postmaster-General and the National Telephone Company, the whole of the plant of the latter company will be acquired by the Post-Office in 1911. The terms of the agreement are practically the same as when the London plant of the company was taken over in 1901, and are thoroughly satisfactory. We see no

reason why it should not be ratified by Parliament. The company will be paid the market value of its plant in six years' time, and various clauses have been introduced to maintain the efficiency of the service during this interval. We note from an attached schedule which, however, does not apply to London, that the maximum annual charge for a full service is 10*l.* and the minimum 5*l.* To those municipalities who have, in accordance with the recommendation of the Act of 1899, established competing exchanges of their own, this agreement is of special importance. After 1911 the present competition will cease, and so the principal reason which induced them to take up telephony will be removed. It seems to us that it would be in the interest of these municipalities to hand over their exchanges as soon as possible to the Post-Office. The question of the depreciation of telephone plant is a difficult one, and it is probable, considering the low charges of municipal telephone service, that a sufficient amount has not been charged for this in the yearly accounts. The Post-Office will take over the service and pay the market value for the plant, and the longer this process is delayed the greater is the risk run by the municipalities of having to meet a substantial loss. In telephony, as in electric lighting, it is practically impossible to make allowance for the "antiquation factor," and the conversion recently of many telephone exchanges from the "magneto" to the "central battery" system proves that this factor has to be considered seriously.

Proposed
Ocean Wharf
near
Greenhithe.

AN important step taken at the meeting of the Thames Conservancy Board on Monday, was the authorisation of a project, brought forward by Captain Wells, R.N. and others, for the construction of a deep-water wharf and transport sheds at Stone, near Greenhithe. It is proposed that the quay should be situated at a little distance from the shore so as to provide accommodation for barges on the inner side, and an important point is that the channel at the site chosen has a minimum depth of 30 ft. at low water. This will obviate the necessity for dredging and enable vessels of heavy draught to come alongside at all states of the tide. The quay, which will be built entirely of timber, is to be 6,600 ft. long by 58 ft. wide, and along the inner side ten transport sheds, each measuring 300 ft. long by 61 ft. wide, are to be placed at intervals so that barges may be loaded either from the sheds, or directly from vessels lying on the river side of the quay. It is stated that the traffic capacity of the new wharf will be six million tons. As the first movement in the direction of providing deep-water accommodation on the banks of the Thames this project is distinctly interesting, and one that will be serviceable in connexion with any of the schemes proposed for the general improvement of the Port of London.

New
Testing Machine
for Alternating
Stress.

In an article dealing with the last meeting of the British Association (Vol. LXXXVII., p. 248) we referred to the

remarkable results obtained by Professor J. O. Arnold by subjecting steel to alternations of stress. Similar experiments were made years ago by Wöhler, and later by Sir Benjamin Baker, and Professor Osborne Reynolds. It is now generally recognised that much importance attaches to this branch of experimental engineering, and with the object of undertaking further research the Committee of the National Physical Laboratory have installed a new alternating stress testing machine. This appliance is designed so that tests may be conducted in accordance with the method of Professor Reynolds, which is to subject the specimen to stresses uniformly distributed throughout the cross-sectional area, instead of causing tension and compression by bending the specimen first one way and then the other. In the latter case the stress attains maximum value only in the extreme fibres, and diminishes to zero at the neutral axis. Hence, it is evident that the principle adopted as the basis of the new machine is the correct one. The apparatus possesses the further advantage that four different qualities of material can be tested under equal stress conditions, this facility being most valuable for purposes of comparison.

Failure
of a
Crane.

LAST week the Strand was once more the scene of an accident in connexion with hoisting machinery. On this occasion a large crane used for raising stone at the new Waldorf Theatre suddenly went wrong while a ton of material was on the point of being received at the top of the building. The stone fell into the roadway, but most providentially no one happened to be passing at the time. Every occurrence of this kind—and there are far too many of them—points to the moral that too much care cannot be exercised in the direction of examining and overhauling all lifting machinery at regular and frequent intervals. Such attention is especially necessary in the case of cranes used high above the heads of passengers in the streets of a city like London.

Old English
Rood-Screens.

MR. E. F. STRANGE, of the National Art Library, South Kensington, delivered an interesting lecture on "Rood-Screens" before the Society of Designers on Tuesday night. The lecturer's remarks were very fully illustrated by limelight views and measured drawings. The subject was dealt with from the decorator's point of view and was concerned mostly with the painting and coloured decorations. Attention was drawn to the deplorable state of neglect, carelessness, and ignorance which these splendid relics of the XVth and XVIth centuries have passed through. The well-known examples from Southwold, Ranworth, Trunch, and Causton were very fully illustrated; they should be studied by all designers, for they show English colour decoration at its best. The lecturer mentioned many circumstances supporting his contention that these screens were coloured by English artists; he also showed very beautiful examples of roods from Devon and from Wales, showing carved decorations of a richness and of a character

to be found nowhere else in this or any other country. It is a pity that the attention of architectural and art students should not be directed towards the coloured decoration work that is still to be found in Norfolk and elsewhere; measured coloured drawings of all that is to be found, collected together in one place, would be of real value.

THE business at a recent meeting of the Kent Education Committee included the consideration of a Report by their Works Sub-Committee, in regard to some proposed new schools, which seems to show that the Committee do not understand how to treat the architects whom they wish to employ. The Sub-Committee recommended that 11 architects employed by the Committee should be under an agreement stipulating, among other things, that the commission payable should be 5 per cent. on contracts under 1,000, and 4 per cent. on contracts of 1,000, and over; this commission (below the usual standard) to cover not only all preliminary conferences and sketches, but the survey of the site or premises, arrangements in respect of party walls and rights of light, attendance (if required) at any local inquiry which might be held with reference to any loan for the said building or otherwise, and all travelling and out-of-pocket expenses. This is simply organised robbery; and we hope that architects who respect themselves will not enter into any such contract with the Committee.

AN architect sends us a copy of the instructions on which the Committee for promoting a competition for a new Hall and Church at Herne Hill are inviting architects to compete. The scheme is a pretty large one, the church to cost 10,500, without tower (which is, however, to be included in the design), and the Hall 3,000, and the Committee are endeavouring to get six architects to enter into a limited competition for this, on the munificent offer of 15 guineas for the best design and 10 guineas for the second; the judgment to be formed by the Committee apparently, as no mention is made of an assessor. The further attractions of this competition are indicated in the following words:—

"The question of the building of the Church may have to be postponed for a somewhat indefinite time, pending financial and other arrangements. My Committee cannot undertake to accept any of the designs for, nor enter into any undertaking regarding the building of the Hall or the Church; and, as they are unable to bind their successors, they cannot guarantee that the architect who builds the Hall shall build either the Church or the Vicarage."

If the Committee expect any architects of position or ability to compete on those terms they will, we hope, be disappointed.

MR. HARRY QUILTER, in a letter to the Times last Saturday, warns collectors and purchasers of Whistler's etchings and lithographs that prices for these are at present artificially "inflated" by dealers, and that "a rapid and considerable drop in the present over-value of Whistler's black-and-white work is absolutely certain." As we always maintained from the first, when no one else

did, that the value set upon these works (the lithographs especially) was greatly exaggerated, it is gratifying to see symptoms of our prophecy coming true even sooner than we expected.

LETTER FROM PARIS.

ACCORDING to a scheme which dates from the Second Empire, the Palais de Justice when completed was to occupy the whole of the parallelogram comprised between the two arms of the Seine, the Boulevard du Palais, and the end of the Ile de la Cité adjoining the Pont Neuf—always with the exception of the picturesque houses looking on the Place de Harlay, several of which still preserve their aspect unaltered since the days of Louis XIII. Some vandals have wished to destroy these, to replace them by a new square in front of the Henri IV. statue. This project has again been brought forward for discussion, and the completion of the Palais de Justice is at present engaging the attention of the Conseil-Général of the Seine. The official plan, as presented by the architect, M. Tournaire, is considered to be open to criticism in some points of detail. For instance, on the Quai des Orfèvres—where there stands at present a block of building erected by M. Diet in the style of the Italian Renaissance, it is proposed to erect a new building in a totally different style, and separated from (or connected with) the other building by a tower which is merely a bad copy of the Tour St. Jacques or the tower of St. Germain Auxerrois. This is the portion of the scheme most criticised, since it has no *raison d'être* in itself, and would hide from view, moreover, the flèche of the Sainte Chapelle, a gem of mediæval architecture which is already far too much buried and hidden by the surrounding buildings. At the angle of the Boulevard du Palais and the quay the architect proposes another tower to which no objection is made, and the design of which recalls aptly the ancient towers of the Conciergerie, the clock-tower especially. The conclusion of the Conseil-Général is that the plan must be re-modelled, more especially in the matter of the first-named tower on the Quai des Orfèvres. It is suggested that something in the nature of the "Porte du Palais de Justice" (so-called) at Bordeaux would be suitable here, and would also have the advantage of not interfering with the view of the flèche of the Sainte Chapelle.

The enlargement of the Halles Centrales is also a subject under the consideration of the building authorities of Paris, and it is hoped that this long desired and very necessary public improvement will now be carried out. The cost of purchasing the property which will have to be cleared away to leave a site for the extension of the Halles is estimated at 20 million francs. The additions will include the erection of new pavilions with façades of seven bays towards the Rue Berger and Rue Coquillière, forming a kind of crescent on the side adjoining the Bourse. The new works will include also the prolongation, across the Halles, of the Rue Antoine Carrière; the enlargement of Rue Coquillière and Rue Deux-Ecus, which, by Rue Berger, will place the Louvre in communication with the Boulevard de Sébastopol; and, lastly, the demolition of Rue Orlin, Rue de Vienne, and Rue Vauvilliers. This will realise the scheme of the enlargement of the Halles, as it was conceived by Napoléon in 1810.

There is a third important subject now under the discussion of the Municipal Council. With the progressive extension of the Municipal Services, the Hôtel de Ville of Ballu and Deperthes is now notoriously insufficient in its accommodation. Already several houses in the Avenue Victoria and the old Caserne Lobau have been transformed into auxiliary offices, and are too small. It is therefore proposed to transfer a good many of the offices to the Caserne Napoléon, behind the Hôtel de Ville. The finance department could be accommodated there; and as the Council room is much too small for its present numbers, it is proposed to build a much larger one along the Rue de Rivoli, with extensive galleries for the accommodation of the public and the press. The realisation of this scheme, which will cost a great deal, is more or less connected with the question of removing the State Colonial Department from the Pavillon de Flore, where its presence constitutes a danger to the collections of the Louvre. If the State consents to give up the Caserne Napoléon to the Municipality,

the latter will in its turn have to cede to the State a large building in Rue Oudinot to form a home for the Colonial Department.

The Under-Secretary of Fine-Arts, M. Dujardin Beaumetz, has just inaugurated at the Louvre the new "Salle de Mastaba," the funeral monument to an Egyptian King of the First Dynasty which the French Government has become possessed of through the good offices of M. Maspero, and which M. Georges Bénédite, the curator of Egyptian antiquities, discovered in the plain of Ghiseh. This new exhibit occupies a gallery on the ground floor, under the Salle des Etats. M. Bénédite has collected in the same gallery some other Egyptian antiquities of great interest, including some coloured statues of which the colour is still to a great extent preserved. The whole gallery is a most interesting and valuable addition to the great Museum.

The shop-keepers and proprietors of the Avenue de l'Opéra have addressed to the Municipal Council a series of proposals with the object of giving to that thoroughfare, which is so busy by day and so dull and melancholy after the shops are shut, something of the animation and gaiety of the Grand Boulevards. Among the other proposed attractions is a scheme for decorating the Avenue by the erection, along the lines of the footpavement, of bronze pedestals carrying vases to be filled with flowers or shrubs according to the season. It is considered to be rather a puerile effort at attraction, and not likely in itself to render the street a rival of Boulevard Montmartre or the Boulevard des Italiens. What it wants is a more monumental style of architecture, and the opening of cafés and theatres, in place of the monotonous row of shops, the closing of which in the evening removes half the light from the street. It is too late now to remedy this defect, though it is surprising that it should have escaped the consideration of M. Alphonse when the street was laid out.

At Père la Chaise cemetery the work of erecting the new Crematorium is going on fast. The building is from the designs and plans of M. Formigé, and the principal façade is to be decorated with a sculptured pediment by M. Bartholomé.

M. Dujardin Beaumetz has decided to reserve three rooms of the Grand Palais des Arts for the organisation of retrospective exhibitions. The first of these will be devoted to the drawings of the late Daniel Vierge, who died last year, and whose work has not yet been collectively exhibited.

We have to regret the loss of M. C.-J. Baptiste Eugène Guillaume, till recently the Director, for many years, of the Ecole Française at the Villa Medici at Rome, who has died there, at the age of 83. M. Guillaume was a pupil of Pradier. He obtained the Prix de Rome in 1845, and in 1855 obtained a "première médaille" at the Universal Exhibition of that year, as well as the cross of the Legion of Honour. In 1862 he became an Academician in the Section of Beaux-Arts, and a little later was elected a member of the Académie Française. In 1867 he obtained the Medal of Honour at the Salon, and was promoted "Officier" of the Legion of Honour, becoming "Commandeur" in 1875, "Grand Officier" in 1889, and "Grand Croix" in 1900. In 1874 he was appointed Director of the Villa Medici, where M. Carolus-Duran has just succeeded him after his retirement on account of age. His first important works, "Anacréon," "Les Gracques," and "Le Faucheur," are in the Luxembourg. Among his other works may be mentioned the bas-reliefs in the Church of Ste. Clothilde, illustrating the life of that saint; the statue of Claude Bernard which stands in front of the Collège de France, that of Thiers at Versailles, and those of Philippe de Girard (Avignon) and Rameau (Dijon). M. Guillaume united in himself very various qualities and talents which gave him rather a special place in the world of contemporary French art. He was also an excellent instructor, in which capacity he has influenced many of the most prominent sculptors of the day.

ROYAL SANITARY INSTITUTE.—At an examination in Sanitary Science as applied to Buildings and Public Works, held at Plymouth on February 24 and 25, four candidates presented themselves, one of whom, Mr. L. G. Hooper (Devonport), was granted a certificate.

NOTES AND SKETCHES IN SOUTHERN ITALY.—VII.

GIOVENAZZO, TERLIZZI, AND RUVO.

GIOVENAZZO is now a small place, with about 8,500 inhabitants, lying on the seaboard between Bari and Molfetta, four miles from the latter and two from the former. Pontanus asserted that it occupied the site of the ancient Egnatia, but that lies farther south, between Monopoli and Fasano.

It has walls and bastions on the sea side, part of which are said to be of the time of Trajan, though they were made in their present form by Giovanni Battista Caracciolo, Prince of Melfi, in 1620, when many houses and churches were demolished and gardens devastated to clear a space without the walls. Bastions pierced for cannon command the entrance to the port and the sea just outside, which, with the stone-built houses peeping above them, look stern and forbidding from the further side of the water. A couple of gateways in them are mediæval and picturesque. The bishopric dates from the IXth century. In the XIth the city belonged to the Byzantines, in 1211 to Otho, forty-six years later to Giordano Lancia of Anagni, and to Robert, brother of King Lewis. It has suffered much from siege and plague, without being of historical importance.

The severest sieges were those by the patriarch Vitelleschi (which was unsuccessful) and by the princes of Melfi and Taranto. The severest plague visitations were in 1213 and 1478.

The cathedral is the most important building in the place. According to tradition, it was begun by Constance, widow of Bohemund. She certainly gave privileges to the city and gifts to the clergy and Bishop Bernerius, among other things a tithe of the returns, which is proved by a document of 1113 in the archives. It was dedicated to S. Maria Assunta, and at a later period to S. Thomas of Canterbury also. The portions of the Norman period which are still remaining are the east front, part of the north side, and one door of the façade. The crypt was finished in 1150, and is fine. It has fifteen vaulted compartments, resting on ten pillars and on pilasters in the wall. In the XVIIth century it was plastered up and "decorated," and at that time the caps were hammered over and broken, but the plaster has been removed. The bases have spur leaves. The diagonal arches raise the crown of the vault much above the transverse arches, so that the vaulting is more or less domical. The cathedral was consecrated on May 2, 1283, by Bishop Giovanni of Giovenazzo. In the first half of the XVIIth century the interior was much altered by Bishop Giulio Masi, and is not now interesting, but it contains an XIth century painting of the Madonna above the high altar, enclosed in a modern tabernacle, and in the treasury is an enamelled silver cross.

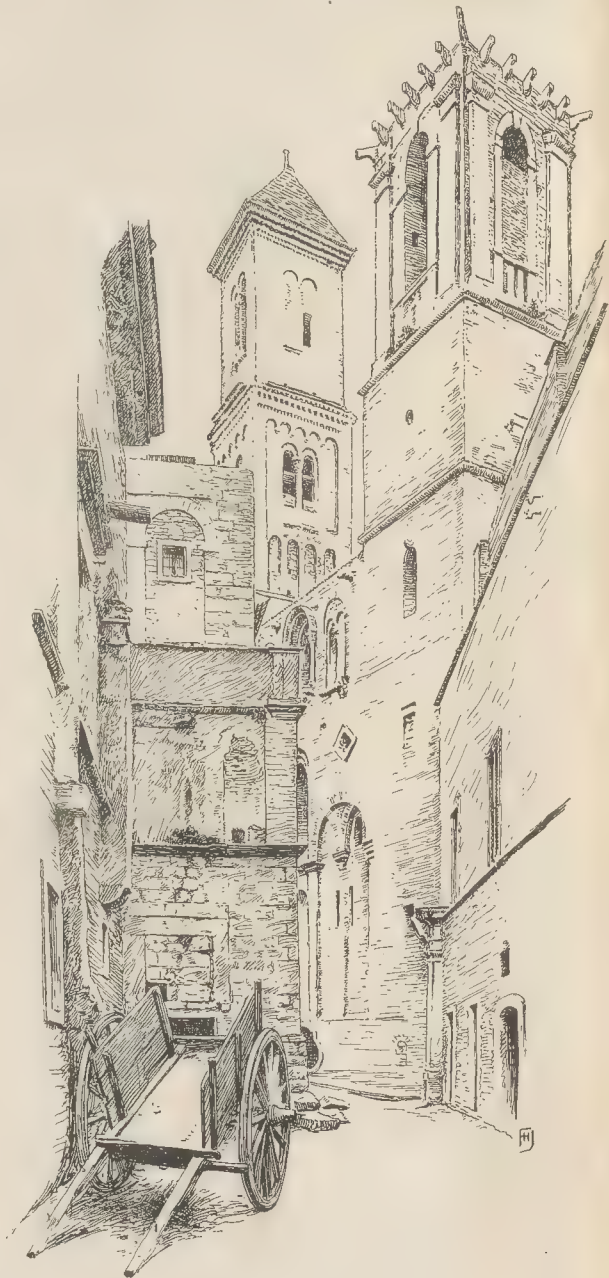
The south door is of the Angevin period, and is rather pretty. It has an arched projecting portion sustained on corbels, slightly pointed, with a square top, above which is a gable roof supported on a little twisted column at one angle, the other side being fixed in a projecting wall. Beneath it is a circular sinking with the Agnus Dei in the centre and ornament round.

The outer archivolt is elaborately carved with acanthus along a round moulding; the inner with the adjoining wall has been restored and recut. On the door hangs a little knocker of twisted iron with a projecting horn. The eastern façade resembles those at Bari and Molfetta, having two campanili with screen wall between them. The south-eastern tower was cased in its lower part to strengthen it after the earthquake of 1660, and the other was rebuilt by Bishop Alfieri (1671-82) as to the part above the screen wall. The wall has two ornamented window piercings in the centre, one above the other and a long panel of similar shape below, and at each side is the commencement of an interlacing arcade with corbel in the centre. At the top two two-light windows flank the centre feature, one on each side, and below them are two squares, set diagonally, pierced with ornament, which reverses the voids and solids. The original tower has two-light piercings above the solid base, then an arreading of four round arches and a two-light window above. The top story is smaller, with a graceful slender shaft in the two-light opening. The exterior in general has been to a considerable extent rebuilt on the old lines.

The town was constantly engaged in ecclesiastical squabbles with the neighbouring Terlizzi, and in 1749 the two places were put under one bishop, who was to be installed alternately in Giovenazzo and Terlizzi. In 1818 both were united to Molfetta, but in 1836 the dignity of the two churches was given back to them, so that there are now three cathedrals and one bishop. In the church of Spirito Santo, which was completed in 1395, there is a painting of the Madonna of Constantinople in the Byzantine style.

Terlizzi lies some five miles inland on a little hill. It appears to have been an ancient Greek city, like so many of the Apulian towns, for

antique tombs have been found near the city, but it certainly existed in the Roman period, since two sepulchral inscriptions found in the communal wood called "Parco" name "Turricum," and one is of the period of Trajan, who restored the Via Appia (which passes about a mile away) so thoroughly that it took the name of Via Trajana, while the octagonal bronze pen-case with silver-figures of the planet upon seven of its sides now in the Naples Museum was found here, as well as coins, vases, and remains of buildings in a place outside the wall called "Lo Specchione." A pontifical bull of Felix IV. (530) proves that the arch priest of Terlizzi was then of importance



Eastern End of Cathedral, Giovenazzo.

in the provincial synods, and had been so for a considerable period, for the words used are "*sicut antiquitus sedebat*." One of the many medieval towers still exists on the east of the town, the "Torre Maggiore." It is a strong, square building, and is at least as old as the period of the Angevins, since the chronicle of Domenico Gravina mentions its treacherous cession to the Sanseverinchesi for 300 florins. It is indeed older, for it is mentioned in a document of 1167 in the archives of the chapter. The castle lay near the cathedral. Its remains were finally demolished in 1845 to build a prison, except one tower, which fell in 1857. There are a few fragments remaining of the circuit of the town walls, and here and there in out-of-the-way corners a few late Gothic windows of delicate design may be found.

In Lombard times the name appears as "Tellicio," and in 1219 as "Terlitium." Frederick II. and Ferdinand of Aragon often lived in the castle. A Count of Terlizzi named Tuziaco was implicated in the murder of Andrew of Hungary, husband of Giovanna I. of Naples, at Aversa in 1345; and, though he escaped punishment at first through the favour

of the Court, he was seized by the people of Naples a year after (who broke into the Castello Nuovo under the leadership of the Duke of Durazzo and Count Avellino) and executed in the barbarous fashion common in those days. Documents of 1131 and 1172 show that there were then Greek churches as well as Latin in Terlizzi. In 1131 Angelo, Archbishop of Bari, in confirming Urso in the Bishopric of Giovenazzo, gave him jurisdiction over the church, and the contests between the two towns for ecclesiastical supremacy smouldered on until the XVIIIth century. In 1738 the Bishop of Giovenazzo was driven away from Terlizzi with stones, but in 1744 an arrangement was made by which the arch-priest Monsignor Fioravanti gave up his office, Giovenazzo being united to Terlizzi, in which town the bishop was to reside, though he was to be installed alternately in the two places. This was confirmed by Charles III. in 1746, and by Benedict XIV. in February, 1747. The people were so puffed up with pride at their success that efforts were made to raise money to build a finer cathedral than the XIth century church (founded in 1038), which had been enough for them before,

and, having obtained a promise of help from Naples, rose in 1749 and destroyed it, the only part preserved being a portion of the west door, made by Anseramo da Trani in the XIIIth century, which now serves for the oratory "del Rosario," where it was placed in 1863. The new cathedral is quite featureless, and languished unfinished for more than one hundred years, having been consecrated in 1872. In the courtyard of the prison is a portion of an Angevin sarcophagus from the same church, enriched with very fine ornamental carving of vine-leaves and palms. The door had lions on columns in the usual fashion at the sides and a statue of St. Michael at the summit of the arch. The campanile had an arch under it as at Trani. It is observable that Anseramo has made his ornament spring from the bottom of one side, pass over the arch, and down to the base of the other side—a very unusual treatment at this period. In the tympanum is a Last Supper, and on the architrave the Annunciation, the Angel appearing to the Shepherds, the Nativity, and the Crucifixion. The festival of the Rosary was instituted to commemorate the Battle of Lepanto, October 7, 1571. The oratory is attached to S. Maria Nuova, the church of the Franciscan observantists, in which the cathedral chapter established itself between 1749 and 1872. Here is a picture by Titi n, with a curious history. It was brought from Spain shortly after 1600, and then showed a Virgin enthroned, with God the Father in the clouds above and SS. John Baptist and Francis with the stigmata on the right and left of her respectively. In 1629 the city belonged to the Grimaldi of Monaco. The Count of Conversano, coveting the picture, made arrangements for it to be stolen, but the thieves took too short ladders with them to reach to the top of the frame, so cut out the lower portion, leaving God the Father in the clouds above. Prince Grimaldi waited for two years to see if there was any chance of its returning, and then had the upper part taken out and sent to Monaco, when he gave it to the King of France, who again gave it to the Grand Duke of Tuscany, and it is now at Florence. The lower part remained at Conversano for fourteen years, when remorse struck the Count and he returned it, escorted by all his clergy with lighted tapers to Palo, his frontier town, where it was received by the clergy of Terlizzi in like manner. The church of S. Maria Severita bears an inscription giving the names of Do^s Nicolaus Angelus and Mag. Nicolaus de Calamis. It is said to date from the year 1000, and belonged to a German order of knights at a later period.

Ruvo was the most important of the three places described in this article, and must have been a very large city, since wherever foundations are dug on the hill which it occupies, vases, coins, and ornaments are found. It is believed to have been twenty times as large as the present town. It is three miles from Terlizzi, and a service of country carts connects the two towns, at a tariff of 1½d. per passenger. The Greek coins found here have the name ΠΡΒΑ, with an owl and head of Pallas, which show that it was an Athenian colony, or the word ΠΡΒΑΣΤΕΙΟΙ. The Roman coins are inscribed RUBI, which is Horace's word for it, but Pliny uses Rubastini. Many fine antique vases and terra-cottas have been excavated, which are now in the Naples Museum. The objects of antique jewellery which have been found here are thought to be the finest in existence, consisting of little bottles encased in a filigree of gold, collars with pendants, brooches, rings, and other ornaments. The men's tombs yielded beautifully-worked armour and similar objects. Three different kinds of tombs were found, which indicated different periods, and many of them had been violated in ancient times. The soil shows several strata of ruins or *débris*, a sign that the town was several times destroyed. Only one antique inscription remains, which records that under Antoninus Pius there were decurions and augustals. There are collections of antiquities in the Palazzo Jatta, the Palazzo Caputi, and the Palazzo Peniccia. After a visitation of the plague in the XIVth century all the records of the city were burnt, but one parchment (of 801) remains in the archives of the chapter, which asserts that, from the time of the foundation of Terlizzi, Ruvo had had its senatorial body. At the third Council of Carthage a Bishop Epigonius of Rubi was present, and in 493 S. Lorenzo, Bishop of Siponto, invited John II., Bishop of Rubi, to assist in the consecration of S. Michele on Monte Gargano.

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Door of Ancient Cathedral Oratory of the Rosary, Terlizzi.



Central Door of West Front, Cathedral Ruvo.

There are several mediæval palaces, of which the communal palace is the most noticeable. It once belonged to the Carafa, and afterwards to the Balzi. It shows remains of windows and arches of the Norman period. The Palazzo Spada, formerly Rocca, has an early Renaissance courtyard bearing considerable resemblance to that of the Palazzo Sylos-Labini at Bitonto. The bishopric was united to Bitonto in 1818; the bishop has been suffragan to the Archbishop of Bari immemorably.

The cathedral is dedicated to S. Maria Assunta, and is a basilica consisting of nave and aisles with transept and three apses opening from it, the plan forming an Egyptian cross. The nave has five bays with piers—on the right side consisting of half-columns and pilasters, on the left pilasters only, forming a cross in plan, but the side pilasters turn to half-columns just below the caps, the projecting portion being supported upon a head as corbel. The pier next to the transept is larger than the rest, and from it a large arch spans that space. There are five chapels beyond the aisles to the width of the transept, as at Bitonto, which have cross vaulting (like the aisles) and modern decorations. The nave has a wooden roof dated 1749. It is possible that there may have been an intention of building a central dome, since the commencement of preparation for it appears in some remaining details, as in the nave walls there appear similar preparations for vaulting ribs. Over the nave arches is a string course supported on long corbels, five between each couple of piers. They are finely carved, some with men's heads, some with beasts, and some with leaf ornament. The capitals also are well carved with great variety,

many of them bearing heads, monsters, lions, twisted together with one head for two bodies, and foliage much undercut. The imperial eagle frequently occurring makes it probable that the church was finished under the early Suabians. Signor Venturi thinks that the vases found in such numbers at Ruvo may have influenced the choice of subject and style. The caps are XIIIth century in style, and all of the same form as at Molfetta. The triforium arcade is very irregular, on the right consisting of two, three, three, and two arches beneath a larger one, and on the left of two, three, three, and three. In one case the arches are pointed and some of them are elliptical, but most of those throughout the cathedral are round. There cannot have been a "matroneum," since there are no traces of stairs, and on the north side the arcade is glazed as windows. A portion of the ancient "palotto" was found during the restorations and used to develop the design of the present one, which is beneath a ciborium designed by Signor Bernich (who carried out the restorations), based on that of S. Nicola at Bari. There are a few remains of indifferent XIVth century painting on the walls of the transept and near the western doors.

The central apse has the usual Apulian east window—a tolerable example—but those of the side apses are square-headed. The ends of the transepts have a large two-light window above and two smaller below. The lower windows resemble those of S. Gregorio, Bari. The nave walls are surmounted by a round-arched frieze with two arches, one beneath the other, and elaborately-carved corbels with heads of classical divinities, etc., excellently sculptured.

That on the south side is of the time of Frederick II. The little windows of the clearstory are filled with slabs, pierced with intricate patterns, as at Bitonto. The façade is curiously proportioned, and it is plain that the ground has risen several feet. The three doors look earlier in style than the rest, and have elaborately-carved ornament surrounding them, especially the centre one, which is probably the most beautiful example of a doorway in the district. There was a church dedicated to the Trinity on this site in 1177, which was the mother church of Ruvo before the cathedral was founded in the XIIIth century, and Signor Bernich thinks (with great probability) that these doorways belonged to it, as they appear small for the rest of the façade. At each side a slender column on the back of a much-worn lion supports a griffin holding a man's head between its paws; that on the left is a modern restoration. They are curiously out of scale with the rest of the door. Herr Mothes ascribes a much greater antiquity to the present church, and thinks it was begun about 1060 and finished before 1110. He bases his belief in this early date partly on the two-light window of the façade and partly on the forms of the clearstory windows and those of the transept, which, with that of the central apse, he says point to the date of the church being between 720 and 800! There is an inscription which refers to the rebuilding of a church and names a Bishop Petrus—a name which occurs in the history of the bishopric in 1100, 1300, and 1440. It may refer to the earliest bishop of the name, and to the earlier church of the Trinity. Herr Mothes groups the central door and the wheel window together in a very strange fashion,

and describes them to about the year 1180. On the doors and at each end are engaged chalets for a porch, the shapes of the vaults of which (elliptical and slightly pointed) appear in the first arch, which is set in the wall. Above the side arches are two quatrefoils, which, with the rose window, are of a later date. Immediately below the rose is a graceful two-light window, and above it a little niche with the figure of a bishop. The slope of the gable and of the aisle walls is rather steep, and they are finished with a raking cornice similar to that of the side walls of the nave. At the summit is a figure of S. John Baptist holding a standard. The rose has diverging columns from a pierced centre, which shows Arab influence in its design. They are octagonal, twisted, or round, the heads of the arches which spring from them are trefoiled, and the lights are filled with pierced lead work in lieu of glass, as at Troja. It may be as late as the XIVth century, but is probably due to Frederick II. and the Saracenic and French workmen whom he employed at the neighbouring Castel del Monte. Round the outside ring are boasts upon brackets.

The cathedral was "restored" in 1587 and 1749, and again, in a different manner, a few years ago. The campanile, which has nothing remarkable in its design except that the door is on the first floor, was a watch tower, and belonged to the city walls, which ran close to the church. Considerable remains of later walls, with bastions pierced for guns and gates may be seen on the side towards Terlizzi, and there are also remains of some of the towers of the medieval nobility. The church of S. Giovanni Rotondo bears an inscription of 1377, recording the name of "Mag. Jobis de Juvenaccio fil. (quondam) M. Andree de Rubo." From the edge of the town towards the sea one sees all the coast towns strung like jewels along the shore, from Monte S. Angelo in one direction to Conversano beyond Bari in the other.

F. H. J.

DR. WALDSTEIN ON GREEK SCULPTURE.

On Friday last week and on Monday last Dr. Waldstein gave two extra lectures to the students of the Royal Academy on the subject of "Greek Sculpture," supplementary to the lectures on sculpture by Mr. Alfred Gilbert.

The opening portion of the first lecture was devoted to emphasising the importance to artists of a general culture, in addition to the acquirement of practical power in their special branch of art. His position in regard to the subject, he said, was very different from theirs. They were occupied in acquiring the craft of the sculptor, he was occupied only in the theory of the art; though he might add that he had at one time practised modelling in clay, not with any hope of becoming a sculptor, but with the view of understanding better the processes of the art whose history it was his business to study. His position was that of being a critic of the art, not in the sense too often attached to the word "criticism," as if it were only the art of finding fault, but in the true sense of the word, which meant the study and discovery of the philosophy of art—the reasons why one thing was better than another. It was a mistake, he thought, to suppose that the best art could be produced by the mere impulsive effort of genius, apart from intellectual cultivation. At the same time he did not think that the creative impulse of the moment should be checked by intellectual considerations of the meaning and motive of art. The intellectual culture should have come before that; it should have filled the artist's mind and influenced his nature, so that when the creative impulse came to him it showed the impulse of an educated mind. The great men of Greece, whether statesmen, artists or poets, were apparently all men with the same general level of culture; Pheidias and Pericles were in this respect on the same level. As an example of the importance of general culture in the understanding of art, he would give them an illustration from another art—that of music. A young girl who was anxious to become an eminent pianist came to Moschles for his opinion on her acquirements. She played him a sonata of Beethoven's. At the end, instead of giving any opinion, he sat down and played it himself, and the young lady was in despair. She said "Oh, how, how can I acquire the power of playing it like that?" He replied, "Read Shakespeare." The idea that uncultured genius would do by itself was a mistake. There might be apparent exceptions, great works produced occasionally

by men of little general culture; but even in these cases they had the inevitable reflection, how much greater things might these men have done if their general education had been higher. As a rule, the greatest artists had been among the most intellectual men of their time; Da Vinci and Michelangelo were examples; and Reynolds too, whose lectures were so full of suggestive thought. These instances were enough to show that general culture did not, as was sometimes argued, extinguish or weaken the special power of artistic creation. It was good for an artist to study and to know the history of his own art. It might be said that there were people who talked admirably and enthusiastically about art and yet could produce nothing; true, but that was not because they talked; they were men who, had they been silent, would not have produced works of art either; but they were interested in art and therefore talked well about it, which, after all, was better than not caring about it at all. Such men were often very unhappy from their consciousness of the gap between their ideas and their want of power of execution; though he had known cases where the gap had been filled up, and where men who began life only in talk about art had afterwards bridged the gulf, and become capable and successful artists. Ignorance of the past history of their art, and of other schools of art, was no factor in producing what was called "originality"; an originality which merely depended on ignorance was not worth having. On the other hand, he would warn them against the danger of setting out to copy any special school or style. The style of various epochs or of various artists was a very interesting subject of study, but to attempt to assimilate it was to lose one's own style. There was a celebrated French saying "Le style, c'est l'homme," which was quite true in a sense; but in regard to art he would rather say "Le style, c'est l'objet"; the question was, what you wanted to do, not a particular way of doing it. The worst form of imitation in art was when a man got to imitating himself; found there was a particular thing he could do, and repeated it over and over again.

In studying the art of the past, he would ask them to consider what it was that made the essential character of Greek sculpture. The much-abused word "classical" had done much to deter some people from the study of antique art.

"Classical" seemed to mean to them the copying of casts of ancient statues; and hence there had arisen in modern times that antithesis between "classic" and "romantic" art, with the idea that the former was a kind of scholastic art, and the latter was founded on nature. This was quite a misconception.* Greek art, in fact, was not "classical," in the sense that we now use the word. The Greeks, on the contrary, went direct to nature. What was it, then, that gave their art that peculiar power which it still exercised upon us? Was it not a strange thing that a people who lived more than two thousand years ago, in a different climate from ours, with social customs and religious faith so different from ours, were still exercising this influence on us through their art; that we could still find no such models for study as their sculpture? Why was it? It was, in the first place that their ideals were based on nature, and nature was unchangeable; and that they generalised nature, instead of copying the anatomical peculiarities of individual models. There were other nude studies in other epochs of art that were very interesting; Albrecht Dürer's Adam and Eve, for instance; but we could not imagine them regarded for hundreds of years as typical figures; they were according to the taste of their day and the peculiarities of the artist's style. We could not hold up the Dürer type as a model for all time. But no one ever stood before the Elgin marbles without feeling that there was something really great; and that was because they were based on the essentials of nature and not on the accidentals.

A number of illustrations were then shown on the screen, showing examples of the progress of Greek sculpture from the very earliest known attempts at the representation of figures, down to the close of the archaic period. In regard to the earliest examples, Dr. Waldstein observed that they did not show so much the attempt to imitate nature as the desire for a harmonious line. He did not consider that art began, as was often said, by imitating nature; it began from the desire to produce something harmonious

* Goethe somewhere remarks that "In art and literature, the Romantic is always the false."—Ed.

and decorative. Art in fact was to the Greeks, in the intellectual world, what the athletic exercises of the Palaestra were in the physical world—the outcome of a surplus of energy. And Greek art owed a great deal to the Palaestra; the Greek sculptor had the opportunity of constantly seeing the nude figure in action, and becoming acquainted with the play of the muscles in every position, and had consequently no need of anatomical study by dissection. Returning to the examples of archaic art, it was remarked that one of them had quite a look of Assyrian sculpture; but they must not be carried away by these resemblances into a mistaken idea of the one country's art being necessarily influenced by the other. The fact was, all sculptures of an early stage of art resembled each other more or less; they were alike because they were early. An interesting example was shown of an early stone statue preserving all the form and characteristics of its predecessor the *Bétras* or wooden plank figure rudely cut in low relief. Coming to the more advanced examples, it was to be observed that architecture had a great and an early influence in leading to a greater variety and freedom of line in sculpture. When figures had to be designed to fill the space of a metope or fit into the angle of a pediment the sculptor was compelled to a greater freedom of pose; and hence we found that single statues, unconnected with architecture, were often more stiff and archaic in style than architectural sculpture of the same period.* This was illustrated especially by the *Ægina* sculptures. In regard to these, too, it might be noticed that the treatment of the heads was much more conventional than that of the figures, as if at this period the figure as a whole was so interesting to the artist that the face was comparatively neglected.

In his second lecture Dr. Waldstein briefly reviewed the ground they had passed over in the illustrations to the last lecture, where they had commenced from the earliest rude attempts at sculpture till, in the Discobolus of Myron, they found the sculptor at last attaining to something like the ease and freedom of nature. He had said before that Greek sculpture had retained its hold over us because it was founded on nature; but how was it founded on nature? What was truth to nature? Suppose an artist tried to represent this audience before him, where and how should he begin? He might show the general effect of the gathering, what would be called an "impressionist" view of it; or he might study the members of it as individuals, without too much detail; or he might go more into the detail of single figures. Each method was true to nature in a way. If one looked at one's own hand far off or close to, or with a magnifying glass, the representation of it would be true in each case, though very different. They had to select the kind of truth they wanted. Insignificant details of realism were not important in regard to the whole of life. He remembered that when Mr. Muybridge first brought out his photographs of animals in motion, an artist said to him (the lecturer) "this will revolutionise the whole art of painting." He said "No," because what these photographs showed was what the eye could not see; the eye unconsciously selected the sum of these successive realistic actions, and the old conventional way of representing a galloping horse, which was the sum of the impressions on the eye, was really much more true than painting horses as if they were buck-jumpers; it was true they did momentarily assume that attitude, but we could not see it.

Good art consisted, for one thing, in a harmony between the form and the matter, between the "how" and the "what"; it had to find the proper form of expression for its subject. As an illustration, take the art of Rhetoric—of Eloquence, as it was commonly called. If he made a very simple and unimportant statement to them, such as "It is a quarter past four," and did so with a great solemnity of voice and gesture, that was bad art; the form of expression too large for the subject. Equally bad was it, on the other hand, if he made a statement of the greatest importance to the future, say, of the human race, in an offhand conversational tone. All the arts were forms of expression, and all dealt with nature, but they differed in their way of doing so. Now sculpture, in its important forms, was expressed in materials of severe and

* May not this partly have resulted from the fact that the single figure was often a peculiarly sacred statue of a deity, for placing in the shrine, and therefore was purposely conformed to the accepted representation consecrated by ritual custom?—Ed.

monumental kind—marble or bronze; and in working in such materials the sculptor must have what might be called the artistic tact to select those aspects of nature which were in keeping with the use of a monumental material. That was what the Greeks did; they, as sculptors, fixed their attention on the central and lasting elements of life, ignoring the non-essential details. That was why their works had set the canon of sculpture for all time. They must be on their guard, however, against carrying this principle too far, against an exaggerated generalism. Sculpture, it must be remembered, had only its one moment of action or life. It had no background, like painting, to assist the spectators' interest; it could not, like drama, carry you on to a climax. It must be sufficient in itself, and for that reason it must be more severe, more self-contained, than painting. That consideration need not entirely preclude their representing action in sculpture, but it must be action with a sufficient and an important aim; not like the portrait statues one saw so many of, with one finger pointing to the barber's shop opposite. Decorative sculpture, which had to be considered in connexion with its surroundings, admitted of more movement than a single figure which was intended to be complete in itself. A garden statue, seen in connexion with the movement of trees or a fountain, could be treated less severely than a statue for a monument. Then dimensions had their effect; dimension meant a good deal. A small statuette might be treated in a playful or humorous manner, which became absurd or offensive in a figure on a larger scale; just as a pretty or a comical expression might be given to a face in a miniature, which would look vulgar and offensive if they could see it painted on a large scale on the opposite wall.

Proceeding to show photographs of examples, Dr. Waldstein first called attention to the two Olympia Pediments shown as whole compositions, and showed also an enlarged view of one of the figures, an old man seated, to point out what might be described as a piece of precocious realism in the treatment of the folds of the drapery, which he asked them to contrast subsequently with the far more effective conventionality of the draperies of the Parthenon sculptures. The Parthenon pediment was illustrated from the well-known drawing by Carrey. He observed that, after all, the Parthenon sculptures could not be taken to represent the highest and central achievement of Pheidias; they were but decorative adjuncts to the building, whereas his highest fame, with his contemporaries, rested on his great single statues of the gods in ivory and gold, and these were probably far greater work than even what we knew in the Elgin marbles. In regard to the metopes, he observed that there were three phases in this part of the work; an early one reminiscent of archaic influence, and two other phases of increasing energy and vitality of action, of which examples were shown. In speaking of the frieze, Dr. Waldstein drew attention to the manner in which it was designed to suit the circumstance of its being lighted by reflected light from below; in low relief, and with the highest relief in the upper part of the figures. In regard to the general composition of the frieze, it was noticeable how dramatically the sculptor had arranged it; the western face, which was the least important, showing only the action of preparation for the procession, while on the sides the real action began, leading up to the central ceremony on the east front; and they would see that on the west face the space was not very much filled up, while at the sides, as the procession developed, the ground of the relief was almost entirely covered with closely packed figures. In these Parthenon sculptures there was not only the beauty of modelling and design to be considered, but the largeness and significance of the general conception. In the East pediment of the Parthenon, for instance, the strife between Poseidon and Athens was connected symbolically with time and space, by the figures of the rising sun on the left and the setting moon on the right of the composition. He hoped that he had been able to show them that "the Antique" was not a dead thing, but something which had its meaning and its significance for us in the present day.

THE MEMORIAL TO LORD WILLUGHBY DE BROKE.—The name of the executors of this monument should have been given as "Messrs. Jas. Garvie & Sons," of Aberdeen, not "Garbie." We were not responsible for the mistake.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At a special general meeting of this Institute, held on Monday last at No. 9, Conduit-street, Mr. T. E. Colclough, Vice-President, in the chair, the Chairman, having announced that the meeting was convened pursuant to by-law for the purpose of electing the Royal Gold Medalist for the current year, moved, in accordance with notice, that Sir Aston Webb, R.A., be elected for the honour. Whereupon it was resolved, *nam. con.*, that subject to His Majesty's gracious sanction the Royal Gold Medal for the promotion of Architecture be awarded this year to Sir Aston Webb, R.A., for his executed works as an architect.

This concluded the business of the special meeting.

The following candidates were elected by show of hands under by-law 9:—

As Fellows.

F. E. Fellows Bailey, Wal-	J. E. Groves, Newport,
sal.	Mon.
H. Bailey.	A. J. Hardwick.
W. Bevan, Pretoria, S.	A. G. Leighton.
W. Africa.	H. H. McConnel, Walsall.
C. B. Bone, M.A., Oxon.	T. Moore.
J. Campbell, Wellington.	A. Neil, Leeds.
New Zealand.	E. T. Powell.
W. E. V. Crompton.	W. G. Wilson.
C. B. Flockton, Sheffield.	E. W. Wimperis.

As Associates.

T. F. Amery.	D. B. Jenkinson.
D. Anderson.	G. A. Johnson.
E. G. Goodson Bax.	J. Miller, Sheffield.
W. S. Beaumont, Man-	N. Nicholas.
chester.	H. L. North, R.A., Cantab.
M. S. Briggs.	Conway, N. Wales.
J. S. Brocklesby.	C. Paterson, Bowdon.
C. Fry Callow.	Cheshire.
C. P. Carter, Mansfield.	A. R. Powys, Montacute,
G. R. Ellis, Manchester.	Somerset.
J. A. Fletcher, Leicester.	E. Quiggin, Liverpool.
H. C. Fread.	G. S. Salmons, Manchester.
W. J. Freeman, Halifax.	H. R. G. Strong Smallman.
C. L. Gill.	N. C. Smith, Moffat, N.B.
H. E. Golding.	E. G. W. Souster, North-
P. A. Hinchcliffe, Barnsley.	ampton.
P. A. Horrocks.	C. J. Thompson.
A. B. Hubbard, Kuala	J. N. Randall Vining.
Lumpur, Selangor.	

The St. Louis Exhibition, 1904.

Mr. H. Phillips Fletcher, Godwin Bursar, 1904, then delivered a lecture, illustrated by some excellent lantern views, entitled "Some Impressions of the St. Louis Exhibition, 1904." Having briefly referred to the commemorative nature of the exhibition, and to the acquisition of the Louisiana territory (1 million square miles) from Napoleon, for 15,000,000 dollars, the lecturer described a large block plan of the exhibition, showing the disposition of the various buildings. The area of the exhibition was 1,240 acres, and the main buildings were arranged in the shape of a fan, the Festival Hall forming the handle to the fan. The architect of the Fine Arts Building was Mr. Cass Gilbert, and he was asked to design a Festival Hall to cover the site right in front of the Fine Arts Building, and this he did, although it entirely hid the Fine Arts Building from the front. As to the engineering works in the layout of the site, hills had to be lowered, valleys graded, a lake had to be piled over, and other works carried out. The whole of the main exhibition buildings were built of timber, and, though this was the largest exhibition so far held, the mode of construction was a great success, and in his opinion wooden spans of 100 ft. were eminently suited for temporary buildings. At least 30 to 50 per cent. in cost was saved by the use of timber instead of steel, and of course the salvage was greater than it would have been in the case of steel. One reason why wood was selected was because the great Steel Trust had, at the time the exhibition works were in hand, such a great monopoly that prices of steel were found to be prohibitive. The buildings were intended to be finished internally in plaster, but this had to be omitted for want of funds. The sculpture work on the buildings was on a magnificent scale. The main cornice level of the buildings was fixed by the Committee of Architects at 60 ft. from the ground. Mr. Masqueray was the chief of design, and there were over 500 buildings to look after during construction. All the main exhibit buildings were designed by members of the Committee of Architects—that was to say, there was a committee of architects appointed, and each member of the committee, after the general plan was decided upon, was given a building to design, but these architects were responsible only for the façade of their buildings, the construction being left entirely to the Division of Works. This method of

separating the design from the execution of buildings appeared to be gaining ground in the United States, and he was of opinion that if this were developed it would not be good for architecture. The architect alone should be responsible for carrying into effect the design he originated, and architects worthy of the name must first of all study the materials they had to deal with, and learn their capabilities for this knowledge was necessary in designing good architecture.

Mr. Fletcher then showed the chief building on the screen, and gave a few facts in regard to them.

The Festival Hall was seated for over 3,500 people, and the width of the dome was 90 ft. The cost was 53,000.

The U.S. Government Building was the only steel arch building on the site, and it was covered by one span of 175 ft., and the lecturer showed a view of the building from some beautiful gardens adjacent to it. The building was designed by Mr. J. Knox Taylor, who was the supervising Government architect of the Treasury Department. Access to the building was obtained by a central flight of steps 100 ft. in width. The cost of the building was 73,000.

The Mines Building was designed by Mr. Theo. C. Link, of St. Louis, who received most of his architectural education in England, and he was one of the two architects who had made any attempt at originality in design. The building suffered to some extent from the fact that in construction the obelisks were jammed up against the front, and so spoiled the view of the dome. The cost was about 110,000.

The Liberal Arts Building looked as though one part was fighting against another, and it seemed to him to be a very unsatisfactory building. The architects were Messrs. Barnett, Haynes, & Barnett, St. Louis, and the cost was 96,000.

The Education Building was designed by the President of the American Institute of Architects, Mr. Eames, of Messrs. Eames & Young. It was a quiet and dignified building, and was very well suited to the purpose for which it was designed. It had an open court which shared the fate of all but one of the open courts designed in connexion with the exhibition buildings, i.e. it was built over. The cost was about 75,000.

The Manufactures Building was by Messrs. Carrère & Hastings, of New York. It was skilfully built, but rather expensive, the cost being about 144,000.

The Louisiana Purchase Monument was 100 ft. in height, with a statue of "Peace" crowning it. The architect was Mr. E. L. Masqueray.

The Electricity Building was the only building whose internal court was not interfered with, and it was used for a wonderful floral clock, 50 ft. in diameter. The architects of the buildings were Messrs. Walker & Kimball, of Boston. It cost some 85,000.

The Varied Industries Building was designed by the architects of the Buffalo Exhibition, i.e., Messrs. Van Brunt & Howe, of Kansas City. It was the only building in which the Corinthian order was not employed with the exception of the Mines Building. There were two internal courts in the building, but they were built over. The cost was 142,000.

The Machinery Building housed some wonderful exhibits, but he was sorry to say that British manufacturers and ironfounders were not well represented. The architects were Messrs. Widmann, Walsh, & Boisselier, St. Louis, and the cost without the sculpture was 110,000.

The Transportation Building was designed by Mr. Masqueray, and it was in many respects a very satisfactory one. In it there were over 4 miles of track for displaying motors, etc. The approximate cost was 138,000.

The Agriculture Building was well designed and adapted for the purpose intended. It was a long square building, without any plaster attempts at imitation stone structure. It was intended to receive colour treatment, but for financial reasons that had to be abandoned. The building covered over 20 acres, and it had 192 columns. It was well proportioned, and although the largest building in the Exhibition, its cost was 110,000, only. Mr. Isaac S. Taylor was the architect.

The Horticultural Building had some effective outside treatment. The cost was 51,000. Mr. Masqueray was the architect.

The Forestry, Fish, and Game Building

was also designed by Mr. Masqueray, and it was a satisfactory little building. In the inside of the building was a large lake which was used for salt water fish, and salt water was brought to it every day from the coast.

The Administration Building was one of the buildings of the Washington University. The Washington University buildings were being erected at the time, and the directorate immediately hired the whole of them for the exhibition. The Administration Building was designed in what was frankly intended to be English Tudor Gothic, but probably the designer had only a nodding acquaintance with these styles, and the building was hard and unsympathetic.

The Washington State Building was erected to show what enormous balks of timber could be obtained. The great angle buttresses were 50 ft. long and 24 ft. broad and 28 in. thick.

Views of the Japanese and French buildings having been shown, the lecturer showed the building for the German Commission, representing the Castle of Charlottenberg and placed on the best site in the Exhibition.

The British Pavilion worthily housed the representative from this country. The motif was the orangery of the Royal Palace at Kensington, and the work was carried out by Messrs. Ernest George & Yeates. The British section was the only section ready on the opening day, although Britain was said to be so effete and behindhand.

In regard to British exhibits we also held our own. Exhibitors from this country took 121 grand prix, 238 gold medals, 162 silver medals, 132 bronze medals, or 653 medals in all. This was an answer to those who took such a jaundiced view in regard to British craftsmanship. In regard to applied arts and fine arts we more than held our own. The building was far and away the best-constructed building on the site, and overtures were being made before Mr. Fletcher left St. Louis for its purchase as a clubhouse for students of the Washington University.

During the erection of the Exhibition buildings, 200 strikes impeded the progress, but in spite of this the enormous contracts were completed in less than three years. In comparing this exhibition with previous great international exhibitions, the thought occurred as to what might be learnt from this vast undertaking. This was especially so, as, owing to the enormous financial loss entailed, it was not likely that people would be found to put their money to such an extent into such undertakings. The enormous waste of these buildings might be obviated, to some extent, he thought. The Washington buildings and the Fine Art buildings will remain, and he thought it might have been possible to have designed some of the others so that at the end of the exhibition they might have been altered, perhaps, and used as hospitals, factories, or for other purposes—for permanent use, in fact. It was generally agreed by European critics that the Chicago Exhibition of 1893 was too vast to be satisfactory, and yet how much more did this apply to the St. Louis Exhibition, which was more than double the size? The fatigue of seeing the exhibition was enormous, and the glare of the buildings was such that one had to use smoked glasses. Each building alone was an exhibition in itself. To have seen every exhibit in the Agriculture Building would have entailed a promenade of over 8 miles, and had the authorities carried out the galleries as originally intended the result would have been worse. Perhaps one of the most surprising facts about this World's Fair was in regard to the inventive genius at the disposal of the American people, and about which we heard so much. It was surprising that so few efforts were made in this direction. The exhibition afforded opportunities for experimental architectural works, especially as the result was to be pulled down at the end, yet so thoroughly had the Ecole des Beaux-Arts carried away American architects that few could get away from its influence even in these temporary buildings. This great fetish was carried to such an extreme that Beaux-Arts clubs existed in New York and other cities. Such slavish copyism should surely be avoided. Of course, nothing could be invented in architecture, but we required no new alphabet in literature to prevent us expressing ourselves in the set style of any particular book, however classic its rendering.

The one prevailing idea amongst American architects was to make the buildings the biggest on earth; if they imparted a little more thoroughness and a closer study of detail into their work a more complete and harmonious creation

might be the result. The model street was execrably paved; the hospital was placed next to the vibrating automobile shed, and to reach one of the entrances to the exhibition one was compelled to stoop under a railway track.

In conclusion, the lecturer said that one could not but admire the pluck and genius and the overwhelming energy which was bestowed on the exhibition.

Mr. H. T. Hare, in proposing a vote of thanks, said that they had all listened to the lecture with the keenest enjoyment. They could not but give credit to the Americans for the very extensive and wide grasp which they give to schemes of this kind, for in England we always seemed to deal with undertakings of this kind in a parochial sort of way. As to Mr. Fletcher's remarks as to the influence which Paris had exercised over the minds of American architects, those remarks were made in rather a depreciatory manner. While one sympathised with the idea Mr. Fletcher had in his mind, i.e., that probably this influence had been so strong that it had killed any sense of originality in the design of the exhibition buildings, yet that idea might be carried rather too far. The influence of the Ecole des Beaux-Arts, and the Parisian feeling generally, certainly led to a very much larger and more comprehensive grip of a scheme of this sort than would be possible from the methods of training which obtains in England, and, in that sense he thought that that influence was not altogether to be deplored. It was gratifying to hear that one of the most successful of these buildings was designed by an Englishman, and he was sure that they could also congratulate the architects of the English Pavilion.

Mr. Edwin T. Hall, in seconding the motion, said that Americans seemed to think in such works in continents rather than in acres, and that being so, he was rather surprised that American architects had not imitated Roman rather than French works. One was rather surprised not to find something on the scale, say, of the Baths of Caracalla, or Hadrian's Villa, or some of the other huge structures of Rome. One would not have been surprised to see some such colossal structure, and it seemed strange that with their breadth of view the Americans did not possess the massiveness of their great Roman progenitors in art. Water schemes had always a great fascination, and water must have been a fine foreground to these exhibition buildings. The glare and dazzle must have been great, but that was part of the whole scheme, he supposed; the exhibition was to dazzle the world. As to the buildings themselves, though we recognised in them classical proportions, many of them were lacking in classical dignity. Many of the colonades were spoilt by features which seemed to be out of harmony and scale. The Transportation Building was a fine conception, and it suggested its purpose, but that could not be said of many of the buildings. He thought the German building was very ugly; and after seeing the quiet dignity of our building, we might rest content with its sensible and dignified artistic lines. When we undertook to build an exhibition, it was generally from 20 to 100 acres in extent, but in America they dealt with square miles.

Mr. A. O. Collard, architect of the Earl's Court Exhibition, said he wished that the son of Mr. Sidney Smirke, R.A., had been with them that evening, for he was the pioneer of exhibitions in America. He left his father's office many years ago, and roamed over the world and engaged in various occupations. He dabbled in architecture when he had the opportunity, and, finally, he was responsible for the great exhibition at Philadelphia. This was not generally known probably, for Mr. Smirke's was a retiring nature, and he had not done much work in England. At Earl's Court the difficulty was how to construct quickly and cheaply, and that was what the Americans could do. In London, however, if they tried to get the County Council to agree to wooden construction faced with plaster or left bare—that was done in some of the St. Louis Exhibition buildings—he was a little doubtful whether they would be convinced that it was safe. He had never yet been able to convince the Council that wooden construction for the buildings at Earl's Court, either naked or covered, was quite satisfactory. He was delighted to see what had been done at St. Louis in that way, for it would be another lever in his efforts with the County Council. It must not be forgotten that the Americans had the whole country at their back in the enterprise, and that they spent 10,000,000*l.*, and could have had more; and they had not had a penny of that

money returned. In this country, unfortunately, dividends had always to be earned, and little on such a scale could be done.

The Chairman said that in regard to the colossal way in which American architects conceived their work, when one came to 30-story buildings in New York it was not only colossal, but monstrous. As to the large way in which American architects thought, he could point to an English architect of over 200 years ago who thought in a very much larger way than any American architect did. The design for Whitehall by Inigo Jones was not only colossal, but it was palatial in its design, and if it had been carried out it would have been not only a monument to Charles, but to the great English nation.

The vote of thanks having been heartily agreed to,

Mr. Fletcher, in reply, said he hoped they did not think that he wished to deny the efforts of French architects or the methods of education of the Ecole des Beaux-Arts. He was quite convinced that their system of education was far nearer the ideal one than that of any other European nation; but what he did say was—and he said it emphatically—that he did not think that if the sole result of studying at the Ecole des Beaux-Arts was to produce a mixture of reproductions of old buildings, that that was doing any good. Mr. Masqueray, who was a distinguished student of the Ecole des Beaux-Arts, did not reproduce fragments of old buildings, disjointed, but he gave them the Forestry and Game building, which was French in feeling, but Masqueray in design. He should be sorry if they thought he was speaking against the education of the Ecole des Beaux-Arts. As to the suggestion of a Roman motif, it was a fine idea, but would it not mean that the whole exhibition would have had to have been designed by one architect? If so, that would not go down in the States, and he doubted if it would in England.

The Chairman announced that the next meeting would be held on the 20th inst. when papers would be read on "Decorative Painting" by Sir W. Richmond, Mr. Alfred East, and Mr. Solomon J. Solomon.

The meeting then terminated.

LOW SIDE WINDOWS IN ANCIENT CHURCHES.

At a general meeting of the Royal Archaeological Institute of Great Britain and Ireland, held on Wednesday, last week, at No. 20, Hanover-square, the Rev. H. Bedford Pim delivered a lecture, entitled "Some Notes on the Origin and Use of Low Side Windows in Ancient Churches." Sir Henry Howarth presided.

Mr. Pim said, so far as he could gather, the subject had not been before the Institute since 1847, when a well-known paper was read by Mr. Parker. He had looked carefully through the subsequent literature, and found it was nearly all characterised by somewhat servile copying of what was written before. Until the last ten or fifteen years there had been no attempt to collect instances of these low side windows and to classify them. His object was not to venture on an explanation which would meet every case; the variety of size, the varied situations in which they are found, and the dates of insertion made it most unlikely that they could all have been used at any time for one common purpose. He hoped that the lecture would lead to some attempt at classification of the windows and openings, and that the result would be that they would be able to draw some conclusions as to some of the many uses to which they might have been put. He did not intend to follow chronological order, but to deal with them with regard to the situations in which they were placed. Proceeding to deal first with windows and openings in what might be called the usual position, the chancel, Mr. Pim gave a large number of limelight views of churches where such windows exist. At Clapham, Sussex, the western of these lancets is lower than the other two, and similar windows, he said, are common in Sussex and Northamptonshire. The window was dropped lower than the others which light the chancel, and he thought that obviously such an arrangement must have been intended to let in light on the book for the priest in choir office. On the north side of the chancel at Clapham Church there is a similar window, which was no doubt to give light to the clerk. At Siston, Lincolnshire, and Herriard, Hants, were similar arrangements. At Bracebridge, Lincs., is a similar arrangement,

but the window was not lowered so much. Windows of another type, but for the same purpose, are found at Ringstead, Norfolk, and Boothby Pagnell, Lincs. One of the questions they had to settle with regard to windows of this type was what was the character of the glass which filled the windows in the chancel. Many of the windows were of date before stained glass was common, and if the glass was not so transparent as we now get it, it would explain the necessity for more light being provided by the use of low windows. At Chalk Church, Kent, there was a doubt, for the low window had a grating, and Gedney, Lincolnshire, was rather a puzzle to him, for there were three large windows in the chancel. The low side window was of somewhat later date, and he felt that the glass must have been poor, and had necessitated the making of the small window to give light in the particular place to the priest. In his second class he placed those low side windows which were placed exactly underneath large windows in the chancel, and which examples were Cowley, Dallington, Wheathampstead, and Claybrook. He felt that although placed under large windows, they were also constructed to give the priest more light. His third class comprised windows in the chancel lowered and transomed. At Garsington, Oxon, there was a transom across both lights, and a similar example occurred at Eynsford, Kent, while at Orton Longueville, Hunts, they found a three-light low window placed below a larger two-light. His fourth class comprised those windows which were placed in close juxtaposition to the priest's door, and he felt that their use must have been connected with that door. A well-known case was that of Rustington, Sussex. At Upton, Northants, the window was absolutely alongside the door, and a further example was to be found at Polebrook. At Alwalton, Hunts, they found the window filled with a memorial, but that certainly was not its original purpose, and the example, usually described as Norman, at Hincsey, Oxon, he certainly thought gave proof that the window was for lighting. In his fifth class he came to a large number of low side windows found in the south side of nave or aisles, but almost all of them were on the border line between the chancel and the nave, and they were almost always in churches of one continuous width from end to end, and of Early English date. He suggested that these windows were used to light the altar, which was so often placed against the chancel or rood screen, on either side of the central door. A remarkable illustration of this was found at Caythorpe, Lincolnshire, where were two windows side by side in an odd position under a large window in the south wall of the nave. One must certainly have been used to light the altar inside, and the other might have been used for a similar purpose. West Tanfield, Yorks, had been regarded as unique, inasmuch as it was described as a window piercing a buttress. Here again they had a chancel very little narrower than the nave, and as it would be impossible to place an altar in the space between the south wall and the jamb of the chancel arch, they enlarged the wall outwards to obtain the necessary space, so what was described as a buttress was really a very small chapel. In the space which was thus obtained the altar was placed, and the windows were put in to light it. Coming to his sixth class—those windows which existed in the west end of the aisle or nave—a famous example was to be seen in the west wall of St. Mary's in the Castle at Dover. Here they had documentary evidence that the window was pierced through the west wall of the church immediately opposite the door of entrance to the tower used at one time as a guard-room, and it was mentioned that men were told off to look through this window to see if the light over the soldiers' altar was burning. Mr. Pim also referred to west end windows at Bracebridge, Dartford, Tansor, and Addwinkle. In class seven he came to those windows which must have been connected with tombs and burials, and it was Mr. Hodgson's contention that this was the common origin and use of all such windows. He was not of opinion that Mr. Hodgson had solved the problem, and certainly his theory could not be a universal explanation. That a good many of these odd openings were used for lighting tombs he had no doubt, but he did not think that explanation would apply to all. At Great Addington, Northants, he felt that the window must have been put in to light the tomb of the Greens, and at other churches, such as St.

Michael's (St. Albans) and at Cogenhoe, the windows were probably used for the display of votive lights. At Stoke Dry is a window pierced through a chancel wall to allow the light over the altar to shine on the tomb in the south chapel. This was done in 1590. His last class presented a series of puzzles. At Dersingham the window must have been of about the same date as the window above, and whether it was put in for additional light he did not know. At Melton Constable the window was said to have been used for confessional, but he did not agree. He felt that the seats inside were what were commonly called return stalls for the priest. At Coombes, Sussex, also he thought the window was put in to light the return stall of the priest. At Weekley there were two little windows only 1½ in. wide, and these may possibly have been put in for the light from inside the church to fall on the graves outside. There is a much larger window in a similar position the S.W. angle of a transept at St. Giles, Northampton. At Grafton Underwood are two tiny slits similar to those at Weekley, but at the extreme east end of the south wall of the chancel and about 7 ft. up. He would say one word about the shutters which were connected with many of these windows, and it was—why should they not have been placed for ventilation? His view was that these windows were used, firstly, for lighting the priest when reading the book in the chancel or serving at the altar in the nave; secondly, for the purpose of letting the light out of the church for votive lights; and, thirdly, for ventilation.

Considerable discussion followed the reading of the paper.

Mr. Keyser could not agree with the lecturer's conclusions, but believed that the windows were placed to enable people outside to see something within the church. In ninety-nine cases out of one hundred they could see the figure of Our Lord under the chancel arch or screen.

Mr. St. John Hope felt that the theory put forward that the shutters were used for communicating lepers would not hold good, and rather favoured the idea that the shutter was opened when the sacring bell was rung, so that it could be heard outside.

The Chairman offered what he described as a fantastic theory that in some cases the windows might have been used for throwing a light on the churchyard paths.

Mr. Pim, in reply, pointed out that he had not put forward any theory as to a universal use of these windows, but believed that they were used for various purposes.

CARPENTERS' HALL LECTURES: THE LIVERY COMPANIES AND THEIR HALLS.

The third of the present series of the Carpenters' Company's spring lectures on matters connected with building was given at Carpenters' Hall, London Wall, E.C., on Thursday last week, when Mr. C. Welch, the City Librarian, gave an illustrated lecture on "The Livery Companies and their Halls." The Lord Mayor presided.

Mr. Welch said that the origin of the companies was a mystery, but in some cases they dated back to Anglo-Saxon times. That, at least, was the case with two guilds, i.e., the Saddlers and the Weavers. It was not easy to decide whether the trade guilds were composed of London artificers or whether they had their origin on the social and religious side, with a connexion with trade developed at a later date. In either case the association of the guild and the craft must have been inevitable from the exigencies of London society at those early times. Besides the two guilds or companies, the existence of which he had already referred to, the early existence of many other guilds was similarly indicated. The lecturer then showed several illustrations of patron saints of the various guilds or crafts, and later on the charters of the companies. Proceeding, he said that at an early period some of the crafts had grown into powerful guilds, though up to the beginning of the XIVth century the commercial jurisdiction of the City lay with the Lord Mayor and aldermen. Subsequently the companies got the power of trade control largely into their own hands, but the grant of charters by Edward III. was soon followed by legislative control. The privileges and importance of the livery companies were greatly increased at the end of Edward's reign, and trade offences were punished with much severity. The lecturer, having shown amongst

other illustrations William Caxton's quaint advertisement, which is to be seen in the Bodleian Library, proceeded to give an account of the corporate life of the companies, and showed a number of interesting illustrations, including the master's cap of the Worshipful Company of Carpenters, the loving and election cups, the pageants prepared by the various companies, hearse cloths, etc. Having referred to the chapels of the various companies, and to the fact that the only one now remaining was the Mercers', in Cheapside, in which services are now held, the lecturer said that during the reign of Henry VIII. the companies were compelled to advance large sums of money and also under Mary, while they were required to keep arms and ammunition at their halls, and some actually kept an armoury. The companies were at their lowest fortune in 1666 after the great fire, but that calamity nevertheless called forth great energy on the part of the various guilds, and soon the various halls were rebuilt in greater sumptuousness than ever. Among other points mentioned by the lecturer were the influence of the companies in the development of Londonderry in Ireland, and their good work in providing almshouses for their aged poor. One pleasant feature of the old halls was the garden which many of them possessed, and which were very beautiful places. Until quite recently there were two of these beautiful oases of the city left, i.e., the gardens of the Grocers' and the Drapers'. The halls of the companies were not only of great use to the companies themselves, but they were often lent to the citizens for various, and sometimes curious, purposes. The lecturer showed a fine series of illustrations of the companies' halls, both ancient and modern. In speaking of the Ironmongers' Hall he said that recently there was some fear that this beautiful hall was to be taken down to give place to a new one, but he was glad to say that the hand had been stayed for a time. Another interesting set of illustrations showed rooms in the various halls in which the special commercial and business work of the companies was performed. Other illustrations showed the many works of art possessed by the various companies.

A hearty vote of thanks to the lecturer, and to the Lord Mayor for presiding, brought the proceedings to a close.

THE LONDON BUILDING ACT.

A LARGELY-ATTENDED meeting of citizens and ratepayers was held on Friday last week in the Guildhall, E.C., to consider the London Building Acts (Amendment) Bill which is being promoted by the London County Council. The Lord Mayor presided, and was supported by the Sheriffs, Sir J. Dimsdale, M.P., Sir E. Clarke, K.C., and a large number of well-known architects, surveyors, and builders.

The Town Clerk read a letter received from the Hon. A. Gibbs, M.P., in which the writer expressed his regret at being unable to be present at the meeting, and said he had given notice of his intention to move the rejection of the Bill on the second reading.

The Lord Mayor, addressing the meeting, said he had summoned the citizens in order that they might have an opportunity of taking combined action in the name of the City of London in opposition to the London Building Acts (Amendment) Bill, which was being introduced into Parliament at the instance of the London County Council. In every ward of the City, without exception, meetings had been held and resolutions passed in antagonism to that most objectionable measure. The London Chamber of Commerce had also condemned it with no uncertain voice. In every borough of the metropolis, save one, the same opposition prevailed; and all the professional bodies, with expert knowledge of the subject, were equally opposed to a measure which, if carried as it stood, would inflict hardship on every man of business in London. It was not that the City of London, or other bodies, had any objection to increased facilities for saving life from fire. The Corporation was, in fact, promoting a Bill with that object in view, and its only opponent was the London County Council. The London Building Acts (Amendment) Bill was a measure of such intricacy that it was almost incomprehensible. The London County Council, however, had not asked the opinion or advice of any of the authorities of the districts affected.

Sir Joseph Dimsdale moved the first resolution, as follows:

"That this meeting of citizens and ratepayers of the City of London is of opinion that the London Building Acts (Amendment) Bill, now being promoted by the London County Council, will seriously interfere with the rights of property, will injuriously affect the development of enterprise in the City of London, and will cause grave interference with and disturbance to the trade thereof; and in view of the gravity of the results to be anticipated therefrom if passed into law, expresses its strong disapproval of the measure."

He said that the Parliamentary Committee of the London County Council unanimously recommended the Council to withhold the promotion of the Bill until 1907. The citizens sat before them, he added, a Bill which was practically unintelligible. It was a semi-private Bill to amend two semi-public measures, the Acts of 1894 and 1898. Those two Acts contained no fewer than 700 sections and sub-sections, and four schedules; while the Bill under discussion possessed 400 sections and sub-sections, and two schedules. The result was that the Bill was practically unintelligible—at least, to the lay mind. That must lead to immense delay and to interminable litigation. The questions dealt with in the Bill were of the first importance not only to the City, but to the whole of the metropolis, and one would have naturally thought that its promoters would have deemed it their duty to have consulted with the Corporation, the borough councils, the Architects and Surveyors' Institutes, and others whose interests were affected. If passed the Bill would vitally affect property in every part of London, and it would jeopardise the position of trustees, the position of public bodies, and existing contracts. To give one instance out of many, the Committee of the Stock Exchange in their petition pointed out that, if the proposal of Clause 15 were sanctioned, owners of property in Throgmorton-street would, if they raised their buildings, be compelled to give up land to the value of 350,000, and not a single farthing would be paid in compensation. Another result of the Bill becoming law would be the enormous responsibility that would be cast upon the landowner so far as the City was concerned. With regard to the safeguards against fire, the proposals in the Bill, if carried into effect, would place enormous financial responsibilities on property owners. So far as the City was concerned, the Corporation had already a Bill to meet this important matter, and he believed that that Bill was not seriously opposed by anyone but the London County Council.

Mr. Delless Joseph, who seconded the motion, gave some instances of the unreasonable character of the Bill. One clause provides that no new building shall be increased in height beyond the previous height of the building formerly occupying the site unless the owner gives up to the public way a strip of land for re-widening the street without compensation. Another clause provides that any addition to an existing building at once constitutes it a new building, and makes it subject to all the new restrictions. The stringent provisions of Clause 97 gives the Council the right to call for such staircases and passages as in their opinion might be necessary, and are retrospective and apply to old and new buildings alike; and by reason of the reduced height clause, the buildings to which they apply will probably involve the bulk of the office, shop, and warehouse premises in the City. Clause 32 provides that part only of land required for widening shall be purchased by the Council, without their being required to purchase the whole site, as provided by the Land Clauses Act, and enables them to avoid paying the 10 per cent. usually added for compulsory purchase. There is a clause prohibiting buildings of the warehouse class upon any site upon which dwelling-houses abut, unless the warehouses be curtailed as if they were dwelling-houses. The new Act proposes also to enlarge the definitions of a domestic building in certain cases, so as to include office buildings. It proposes to define a high building as one of which the floor of the uppermost story is 50 ft. from the street level instead of, as at present, 60 ft. No adequate case had been made out by the London County Council for the Bill as it now stood. It was claimed by the members of that body that the Bill facilitated means of escape from buildings in the case of fire, but, in answer to that contention, he wished to point out that only about one-tenth of the whole number of clauses in the Bill dealt with the question of fire escape. The Bill, as had been pointed out, had been condemned

by the unanimous voice, not only of the City, but of the metropolis. The Borough Councils met in conference, and, with the single exception of Chelsea, unanimously condemned the Bill. As a matter of fact, if the fire clauses were allowed to stand, it would practically mean the rebuilding of London. At the same time he realised that the time was ripe for a new Act. So far as the question of providing adequate means of escape from buildings not under the Factory Acts was concerned, the Bill promoted by the Corporation was admirable, simple, and inexpensive. What, he asked, was the keynote of the L.C.C. Bill outside the fire provisions? It was a Bill which contemplated the carrying out of public improvements by a policy of confiscation—as a perusal of the clauses would show. It proposed to interfere with the rights of property, and disturb the inviolability of contract. If they were to have a new Bill, let it be a consolidation Bill without reference and re-reference. The L.C.C. Bill might have been drafted with the best possible intentions, but what was wanted was a consultation between all the public bodies interested, in order that the whole complex question might receive the most careful inquiry, a consolidation Bill being drafted which would be welcomed as being the outcome of the best intelligence on the subject. The effect of the present Bill was to make the County Council paramount, and the result of the Bill would be to paralyse business, block enterprise, check the employment of capital, involve a reduction in the employment of labour, and generally affect the security of investment and contract. The City of London had, indeed, been treated as if it was composed of green fields, and no regard had been had to the extraordinary and unique position occupied by the City of London. In the previous Bill the City was exempted from many clauses, and the unique position the City occupied was recognised; but by one insidious clause in the new Bill the whole of those exemptions had been taken from the City. The Bill stood self-condemned, and, being badly drafted, produced without consultation with the local authorities, unworkable, inequitable, and confiscatory, should be withdrawn.

Mr. Davis, rising from the body of the hall, moved an amendment expressing satisfaction at the action of the London County Council in promoting a Bill with the object of preventing fire and loss of life, and adding that any modification of the Bill which might be reasonably necessary should be done by arbitration through the surveyors of the Corporation and the surveyors of the London County Council, with a view to the peaceful settlement of the question.

The amendment having been seconded, a show of hands was taken, when only three were held up for it. The original resolution was then carried with practical unanimity.

Mr. Felix Schuster proposed: "That, in the opinion of this meeting, any proposed alterations or amendments to the London Building Acts should be submitted to the local authorities before being presented to Parliament." He said that the Bill had met with the opposition of all the trading and commercial interests. Some of the most important financial houses and several of the largest banks had found it essential to lodge a petition against it.

Mr. Walter Emden, in seconding the resolution, said that the London County Council appeared to forget that the matter was of a highly technical nature; and that they had no one really capable of dealing with so important a subject. The late Act stood for over sixty years because it was drawn properly, and every possible assistance was obtained. Now there were the '78 Act, under which buildings were controlled by the London County Council; the Public Health Act of 1890; and the 1894 Act of the London County Council. That was a most unreasonable state of affairs. It was necessary to bring the various Acts into line, and make one single measure, which could be understood. In the provincial boroughs it was possible to send in one set of plans, and have them examined and approved in a fortnight. The London County Council, however, had at least three committees, to each of which it was necessary to send a set of plans, while afterwards it was necessary to proceed to the local authority and submit the plans. That was most objectionable. Why could they not have the power to deal with buildings as easily as was the case in the country? They had as much knowledge and as much information in London, with possibly less time to spare. The duties of the London County Council

should only be those of a central authority. It was absolutely necessary that there should be codification. Then there was another point. Had the County Council shown themselves to be the best authority to bring in such a Bill? He did not think so. In that particular measure they proceeded to exempt themselves from the most onerous clauses. Did they show they were going to consider the matter justly? The County Council were not constituted to deal with such a matter. It required to be placed in independent hands, where the best technical knowledge was available.

The motion, being put to the meeting, was carried unanimously.

Colonel W. B. Burch, chairman of the Associated Owners of City Properties, moved: "That copies of the foregoing resolutions be forwarded to the Corporation of London, the London County Council, and the representatives of the City in Parliament; and the Corporation be requested to continue to offer a strenuous opposition to the Bill."

The motion was seconded by Mr. H. D. Searles-Wood and heartily agreed to.

Sir Edward Clarke, in proposing a vote of thanks to the Lord Mayor for presiding, said that he agreed with Sir Joseph Dimsdale that the Bill was one which it was difficult for business men, and even for lawyers, to understand. The County Council had adopted a very good plan for preventing, so far as they could, any criticism from lawyers, because there was a clause to exempt from the operations of the Act the properties of Lincoln's Inn, the Middle Temple, the Inner Temple, and Gray's Inn. He supposed the Council hoped, in that way, to pacify the lawyers. But though he was a lawyer, he was less interested in Lincoln's Inn than in the City of London, and so he had come to associate himself with them in making what he hoped would be an effectual protest against any further progress with this unhappy Bill. The Bill was as badly drawn as a Bill could be upon a subject which required clearness in the first place, so that property owners and business men would be able to look at the statute and understand what were their obligations. He thought that no one would be able to dispute the authority of that large and representative meeting to speak for the City in this matter.

The meeting shortly afterwards terminated.

THE LONDON MASTER BUILDERS' ASSOCIATION.

THE 33rd annual general meeting of the London Master Builders' Association was held at Nos. 31 and 32, Bedford-street, Strand, W.C., on the 23rd ult., when the report of the Council for the year 1904, and the audited accounts and balance-sheet, were received and adopted.

The meeting gave instructions and powers to the Council to confer with the trade unions with a view to improve the present working hours arrangements.

A hearty vote of thanks was given to Mr. J. Carmichael for the able and successful manner in which he discharged his presidential duties during the past year.

The following officers were elected for the ensuing years, *i.e.*—

President.—Mr. Fredk. Higgs.
Vice-Presidents.—Messrs. J. W. Lorden and William Higgs.
Treasurer.—Mr. F. L. Dove.
Hon. Auditor.—Mr. A. B. H. Colls.
Council.—Messrs. C. Ansell, G. Appleton, F. S. Bywaters, G. Bird Godson, F. Maitland May, A. W. Turnbull, Towell J. Williams, L.C.C., F. F. Kider, F. Ruddle, and H. J. Shelbourne.

The following paragraphs are taken from the annual report:—

The work and influence of the Association are steadily extending, and during the past year your Council has been instrumental in adjusting many trade matters of importance. The number of members has increased, but the burden of protecting our interests in the metropolis is still borne by too few, and, to remedy this, members are urged to exert themselves to increase the membership of the Association. Forms of application, etc., can be obtained from the secretary.

No trade disputes of any moment have occurred during the year. The Conciliation Boards have frequently met to deal with questions raised by the workmen's societies. In every case your representatives have carefully guarded your legitimate rights and checked any strained interpretations being put by the workmen's representatives upon the working rule agreements. The Association has defended all cases involving principles where members of the L.M.B.A. have been sued by workmen backed by their trade unions.

Applications were received from the Engine and Crane Drivers' Society and Labourers' Societies for the formulation of working rule agreements, but your Council, after careful consideration, declined to accept the propositions. The agreement entered into by the National Federation of Master Builders, the National Association of Master Plasterers, and the National

Association of Operative Plasterers was the result of your Council's action. Copies of the agreement have been forwarded to members.

All Bills before Parliament affecting the building trade have been carefully watched, and action has been taken when necessary. Mr. William Shepherd, as the representative of the L.M.B.A., gave evidence before the Royal Commission on Trade Disputes and Trade Combinations, and his evidence will be published in the course of a Blue Book. Your Council is indebted to Mr. Shepherd for his valuable services.

Your Council desires to express its thanks to Mr. Henry Holloway, J.P., who, as the representative of the L.M.B.A., gave evidence before the Departmental Committee appointed by the Home Office to inquire and report—

- (1) What amendments in the law relating to compensation for injuries to workmen are necessary or desirable; and
- (2) To what classes of employment (not now included in the Workmen's Compensation Acts) those Acts can properly be extended with or without modification.

Mr. Holloway's evidence will appear in due course in the Blue Book containing a report of the investigation. With a view to the removal of an injustice from which builders and contractors have long suffered, a deputation from your Council waited upon the Metropolitan Water Board and suggested that the supply of water for buildings in course of construction should be regulated on the following lines:—

1. That the charges for water for building operations should be based on the amount of water actually consumed, and not on a percentage of the cost of the building, as at present.
2. That in all cases the consumer shall have the option of supply by meter, the meter to be of a standard and reliable character.
3. That the water charges should be uniform throughout the metropolitan area.
4. That the amount charged per thousand gallons should not be more than that charged for other manufacturing purposes.

The Chairman promised that the views of the deputation would receive the careful and sympathetic consideration of the Water Board.

Your Council was invited by the L.C.C. to express its views on the Local Building Acts (Amendment) Bill. The matter was referred to the Parliamentary Committee, which, in conjunction with the Parliamentary Committee of the Institute of Builders, lodged a petition in Parliament against the Bill.

Though your Council failed last year to come to terms with the trade unions in regard to alterations in the winter working hours, the question has not been shelved, as is evidenced by the notice of motion on the agenda for the annual general meeting. Your Council attaches great importance to this matter, and trusts that the Association will strongly support whatever policy it determines to adopt.

The financial position of the Association has been greatly improved since the introduction of the new method of subscription, and there now is a substantial reserve fund.

ARCHITECTURAL SOCIETIES.

NORTHERN ARCHITECTURAL ASSOCIATION.—Under the auspices of the Northern Architectural Association, Mr. W. H. Wood (of Messrs. Oliver, Leeson, & Wood), delivered at the Y.M.C.A. Buildings, Newcastle, recently, a lecture on "The Design and Construction of Newcastle Cathedral." Mr. J. Walton Taylor presided.—In the course of his remarks Mr. Wood said that the Cathedral tower was of Scottish form, of which there were only four other known examples—St. Giles's, Edinburgh, King's College, Aberdeen, one at Linlithgow, and another in London, which was by Sir Christopher Wren. St. Nicholas' was the most elegant example of the set, and was done by an architect of consummate skill. It was 204 ft. high to the top of the centre vane. It had been the subject of repairs at various times, the first recorded being in 1645, a year after the siege of the Scots, whose general threatened to destroy it, and was only prevented from doing so by the ready wit of the Mayor, Sir John Marley, who placed the chief Scottish prisoners on the top of the tower. It was also repaired by Sir Gilbert Scott in 1868, who put in entirely new foundations and did a lot of tying up, necessary for the big arches to carry the lantern. It was last repaired in 1895 by Messrs. Oliver, Leeson, & Wood, when portions of the pinnacles were re-built and the vane re-made.—Mr. Plummer announced that further subscriptions amounting to 20*l.* had been received towards the permanent premises fund. That made about 60*l.* since the last meeting.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—A special meeting of this Society was held on the 2nd inst. in the Society's rooms, Leopold-street, Mr. T. Winder presiding, when Messrs. A. W. S. Cross, M.A., and George Hubbard, F.S.A., of London, read papers on the proposed statutory registration of the architectural profession. They dealt with the various objects sought for in connexion with the architect, the treatment of unworthy members, and the improved status of the profession. The responsibility of the architect in connexion with the health and safety of the general public was sufficient reason for the promotion of an Act

of Parliament (now being drafted by the R.I.B.A.) to prevent the untrained and incompetent practising upon the ignorance or credulity of the building public. The result would be greater confidence of the public in the ability and integrity of the profession, and lead to better work and a better understanding between client and architect. The various proposals of the draft bill were also named and commented upon.—A discussion followed, in which Messrs. E. M. Gibbs, J. R. Wigfull, W. H. Hale, C. M. Hadfield took part. On the motion of Mr. T. Winder, seconded by Mr. E. Holmes, a hearty vote of thanks was accorded Messrs. Cross and Hubbard.—On the motion of Mr. J. Smith, seconded by Mr. W. C. Fenton, it was resolved that the Society again affirm the necessity for the statutory qualification of architects, and trusted that a satisfactory bill would be put forward as soon as possible.

Fifty Years Ago.

ARCHITECTS AND DECORATORS.—It should, when inquired into, be obvious that it is an erroneous position for one to be in, to have the design of the plan and of the outside of a building, and to be generally warned off from the interior; for, even where the architect is disposed to attempt that for which we say he would be best qualified, but for which some say he is unfitted—the fancy which people have that the paying for a thing gives the right to indulge "a taste," counteracts all his aims and undertakings. A trading class of decorators is naturally more subservient, and *art* suffers.

Interior decoration is neglected as a study simply because in the present state of taste the knowledge would seldom do much for the architect, either in reputation or in another way. The position of the department of architecture referred to, however, is, that whatever it may not lose by supposed inability of individuals, the general art loses much, and the subordinate branch the very elements of all good art, which the training of one whose ideas are ever grounded on structure could best supply.—*The Builder*, March 10, 1855.

COMPETITIONS.

CARNEGIE LIBRARY, NELSON. The Town Council of Nelson have appointed Mr. G. H. Willoughby, F.R.I.B.A., of Manchester, as assessor in this competition. More than 200 designs have been sent in.

Illustrations.

THE PALAZZO IMPERIALE, GENOVA.

THE drawings of this building and its decorations are by Mr. Harry Morley, a student of the Royal College of Art, South Kensington, and are selected from the drawings for which the Council of the Institute of Architects awarded to their author, this year, the Owen Jones studentship.

Mr. Morley sends us the following notes in regard to the building and the illustrations:—
"The Palazzo Imperiale, Genoa, was built in 1560 by Bergamasco, and is situated in the small Piazza Campetto. The surrounding buildings are so high and close to the palace that it is now impossible to obtain any effective view of the elevation with its beautiful stucco modelling; but this has not always been so, as the word 'Campetto' means a small field, and the dedication of the parish church to 'Our Lady of the Vines' suggests that the surrounding land was at one time open. Over the atrium, which is entered directly from the Piazza, is the decorated ceiling. The ornament is painted on a white ground in 'fresco secco', and is framed up with enriched plaster mouldings. The method of design, with curiously stopped bands of colour, seems peculiar to the neighbourhood of Genoa, but an earlier example of this device may be seen in some of the Loggie of the Vatican.
"The colour is light in effect and is now toned with a slight greenness which is probably due to age; but the colour seems to have suffered very little and there are few traces of restoration.
"The ceiling generally is attributed to Bergamasco, but the panel representing the feast of the gods is said to be by Luca Cambiaso, and in fact shows a much more accomplished handling than the other panels."

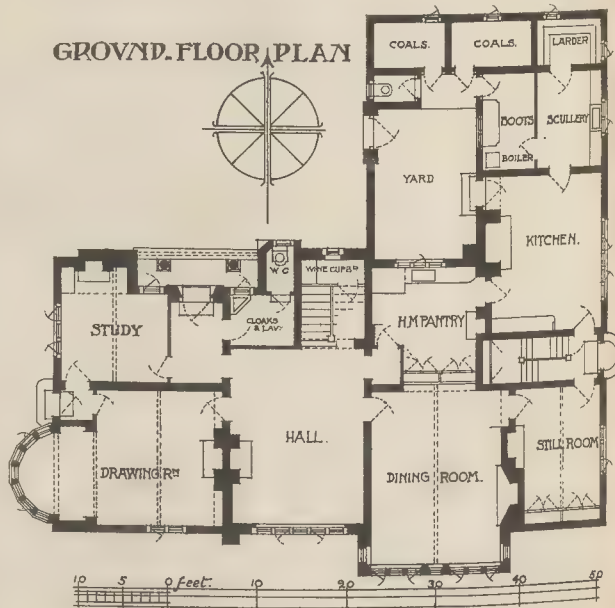
A PAIR OF HOUSES.

THE drawing, which was exhibited at last year's Royal Academy, shows a design for two semi-detached houses intended to be built of local stone and rough-cast, with bays and bands of a dark grey stone.

The architects, Messrs. Freeman & Ogilvy, have not preserved the plan, as the houses were eventually carried out on a different design.

HOUSE AT RUGBY.

This very picturesque drawing, like the last-



House at Rugby. Plan.

named, was exhibited at the last Royal Academy exhibition.

The annexed plan shows the general arrangement of the house. Mr. J. W. Simpson is the architect.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Mr. J. Williams Benn, Chairman, presiding.

Loan.—On the recommendation of the Finance Committee, it was agreed to lend Lambeth Borough Council 1,483*l.* for paying works.

Habers to Strand.—On the recommendation of the Improvements Committee, it was agreed that the design presented to the Theatres and Music Halls Committee on 22nd February, 1905, for the elevation of the theatre to be erected on land belonging to the Duke of Bedford at the junction of Aldwych and Drury-lane be approved, subject to the Aldwych elevation of the premises being constructed in Portland stone.

Mortuary, Avondale-park.—The following recommendation of the Parks Committee was agreed to:—

"That the Council of the Royal Borough of Kensington be informed that the Council protests most strongly against the action of the Borough Council in erecting a mortuary upon a part of frontage-land, and to acquiesce in the question of the removal of the building, requires the Borough Council to separate the mortuary from the park by suitable fencing, to screen the building on the park side by planting suitable trees, and to acquire, and add to the park, land equal in area to the lands occupied by the mortuary and set apart in connexion therewith, such acquisition and such works to be subject in all respects to the approval of the Council."

The Crane Accident in Aldwych and the Building Act.—Mr. Dew asked the Chairman of the Building Act Committee whether his attention had been called to the accident at Aldwych, when a crane snapped and two men were injured. Had the Council power under the London Building Act to inspect cranes, and if not, whether these powers would be sought for under the proposed new Act, so as to protect workmen.

Captain Hemphill, Chairman of the Committee, said that the Committee had had the matter before them, and they considered it of such consequence that they propose to bring up a report to the Council next week; the accident was caused by a defect in a metal casting. There was no power under the present Act for the Council to control such machinery, but power was being sought under the amending Bill—power to appoint an inspector to examine such machinery and also to inspect and control it.

Mr. E. Collins asked the Chairman whether it was proposed to withdraw the amending Bill, seeing that there were about 80 petitions against it. There was no prospect of passing the Bill.

Captain Hemphill said the question was one for the Parliamentary Committee. The number of petitions against a Bill was no evidence of the real position, for some petitions were merely in regard to a single clause.

Votes of Thanks.—This being the last meeting of the Council before the statutory annual gathering next week,

Mr. Yates moved a vote of thanks to Mr. Benn for his able, courteous, and impartial conduct in the chair of the Council during the past year.

Mr. Sidney Low seconded the vote, which was accorded, and Mr. Benn replied.

On the motion of Mr. Granville Smith, seconded by Mr. Harvey, a vote of thanks was passed to the Vice-Chairman, and Mr. Cornwall briefly replied.

A similar vote was, upon the motion of Mr. E. R. Taylor, seconded by Mr. Greenwood, passed to the Deputy-Chairman, Mr. Alderman Alston.

Working-class Dwellings.—Mr. Hubbard moved, in pursuance of notice, that, having regard to the extent to which the demolition of the dwellings for the accommodation of persons of the working class has been, and is being, effected by owners of private estates in the County of London, without provision being made for other suitable accommodation in lieu thereof, it be referred to the Housing of the Working Classes Committee to consider and report whether the Government should be asked to promote legislation for the amendment of the Housing of the Working Classes Act, 1903, so as to extend to the owners of private estates the obligation which, by section 3 of the Act, rests upon local authorities, companies, or persons, to rehouse working-class persons

displaced through the acquisition of land under statutory powers.

Mr. Horniman seconded the motion, and said that Chelsea was at the present time suffering greatly from the demolition of working-class dwellings.

The motion was supported by Mr. G. Dew, Mr. J. Lewis, Mr. Bruce, Mr. B. Cooper, and Dr. Cooper, and was carried by a large majority. The Council soon afterwards adjourned.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Hampstead.—The retention of a porch at No. 10, Boundary-road, Hampstead (Mr. F. S. Hammond for Mr. Furber).—Consent.

Wandsworth.—Eight houses on the western side of Thrale-road, Wandsworth, between Ribblesdale-road and Nimrod-road (Mr. A. W. Gosden).—Consent.

Hammersmith.—That the application of Messrs. B. T. and W. J. Flexman for an extension of the period within which the erection of one-story shops in front of Nos. 350, 352, 354, and 356, King-street, Hammersmith, was required to be completed, be granted.—Agreed.

Westminster.—Two iron and glass shelters at the Imperial Theatre, to abut upon Tothill-street and Dartmouth-street, Westminster (Messrs. E. Keeling, Toale, & Co., Ltd., for Mr. L. Wall).—Consent.

Dulwich.—Bay windows, porches, wooden cornices, and sham half-timber work to ten semi-detached houses on the north side of Burbage-road, Dulwich, westward of the entrance to the London County Athletic Grounds (Mr. W. Griffiths for Mr. J. Watson).—Consent.

Haggerston.—Projecting porch, steps, quoins, pediment, and cornice to a building, upon the site of Nos. 225 and 227, Hackney-road, Haggerston (Mr. G. H. Lovegrove for the Gladstone Radical Club).—Consent.

Hammersmith.—One-story additions in front of the Latymer and Godolphin school, Ilfley-road, Hammersmith (Messrs. J. Dorey & Co., Ltd., for the Board of Governors of the school).—Consent.

Hampstead.—A pent over the front entrance to a proposed cottage at the North-Western Hospital, Fleet-road, Hampstead (Mr. W. T. Hatch for the Metropolitan Asylums Board).—Consent.

Holborn.—A projecting clock at No. 11, John-street, Bedford-row, Holborn (Mr. F. R. Cooper for the Royal Oak Benefit Society).—Consent.

Holborn.—That the application of Mr. P. N. Ginhams for the Education Committee of the Council, for an extension of the periods within which the erection of the Council's Central School of Arts and Crafts and London Day Training College, upon a site abutting upon Southampton-row, Orange-street, and Fisher-street, with projections, was required to be commenced and completed, be granted.—Consent.

Wandsworth.—Buildings on the north-eastern side of Longley-road, Tooting, eastward of No. 181 (Mr. H. Cusden).—Consent.

Westminster.—A balcony at a block of office buildings on the north side of Tothill-street, Westminster, eastward of the Imperial Theatre (Mr. J. S. Gibson for Messrs. Holloway Brothers, London, Ltd.).—Consent.

Lewisham.—Buildings on the east side of Bromley-road and south side of Sangley-lane, Catford (Mr. A. W. Osborn for Mr. J. Watt).—Consent.

Woolwich.—An additional story over a one-story shop at No. 98a, High-street, Plumstead, with an iron staircase at the rear, to abut upon Mineral-street (Mr. A. L. Guy for Messrs. Fears, Ltd.).—Consent.

Kensington.—One-story shops upon part of the forecourts of Nos. 50, 52, 54, and 56, Church-street, Kensington (Mr. W. G. Hunt).—Refused.

Hackney, South.—Buildings on the north side of Marsh-hill, Hackney, to abut upon Piney-road, Trehurst-street, and Adey-street (Mr. A. Armstrong for Mr. A. E. Simpson).—Refused.

Hampstead.—A house upon a site abutting upon the southern side of Fawley-road, and western side of Crediton-road, Hampstead (Messrs. Boehmer & Gibbs for Mr. E. Walker).—Refused.

Hampstead.—An iron and glass covered way at No. 14, Buckland-crescent, Hampstead (Mr. J. P. Hamilton).—Refused.

Lambeth, North.—A projecting sign at

No. 235, Westminster Bridge-road, Lambeth (Mr. T. L. Wood for the Chinnery Patent Sign Company).—Refused.

Width of Way.

Kensington, North.—Formation of a manure-pit and an alteration to the boundary fence at the rear of No. 87, Ladbroke-road, Kensington, at less than the prescribed distance from the centre of the roadway of Boyne Terrace-mews (Mr. E. W. Marshall for Mr. E. Davis).—Consent.

Paddington, North.—Two water-closet buildings in the area of No. 13, Cambridge-place, Paddington, abutting upon Market-street (Mr. W. H. Smith for the Humber Company, Ltd.).—Consent.

Paddington, North.—A boiler-house at St. Mary's Hospital, Praed-street, Paddington, with external walls at less than the prescribed distance from the centre of the roadway of Francis-street (Messrs. Dolby & Williamson).—Consent.

Kensington.—A smoke hole at the rear of No. 44, Newburn-street, Lambeth, with external walls and boundary fence at less than the prescribed distance from the centre of the roadway of Orset-street (Messrs. J. A. J. Woodward & Sons for Mr. D. Carroll).—Consent.

St. Pancras, East.—Permission to retain a wood and glass covered way at No. 142, Camden-road, St. Pancras, abutting upon Rochester-square (Mr. G. Cox for Mr. W. Radcliffe).—Refused.

Width of Way and Lines of Frontage.

Hampstead.—The retention of greenhouses on the north side of College Villas-road (Mr. F. Debenham).—Consent.

Woolwich.—Additions to the Woolwich Polytechnic, Lower Market-street, Woolwich (Messrs. Monckton & Gillespie for Mr. Ogilby and the Governors of the Woolwich Polytechnic).—Consent.

Formation of Streets.

Wandsworth.—That an order be issued to Mr. E. S. Trehearne sanctioning the formation or laying out of new streets for carriage traffic on the Templeton House Estate, Priory-lane, Roehampton, and in connexion therewith the widening of portions of Priory-lane, and the lane on the northern side of the estate.—Agreed.

Woolwich.—That an order be issued to Mr. F. Bethell, refusing to sanction the formation or laying out of new streets for carriage traffic on the Bostall Estate, Bostall Hill, Plumstead (the Royal Arsenal Co-operative Society, Ltd.).—Agreed.

Deviations from Certified Plans.

Finsbury, Central.—Certain deviations from the plans certified by the District Surveyor, under sections 13 and 14 of the Act, so far as relates to the proposed erection of a one-story workshop at No. 46, Brunswick-close, St. John-street-road, Finsbury (Major C. E. Dance for the Marquess of Northampton).—Consent.

Space at Rear.

St. George, Hanover-square.—Residential farm on a site abutting upon Buckingham Palace-road, Eccleston-street and Eccleston-street East, St. George, Hanover-square, so far as relates to cellars being placed under the central yard of the buildings and also to the floor of the air duct or passage connecting the yard with the inner area being raised (Messrs. Read & Macdonald for Messrs. Holloway Brothers).—Consent.

Working-class Dwellings.

Greenwich.—A dwelling-house to be inhabited by persons of the working class, and proposed to be erected, not abutting upon a street, on a site at the rear of No. 92, The Stowage, Deptford (Mr. J. Webster for Messrs. May & Roberts).—Refused.

The recommendations marked † are contrary to the views of the local authority.

TOWN HOUSE SCHEME, ABERDEEN.—A sub-committee of the Finance Committee of the Aberdeen Town Council met recently for the purpose of considering the plans which have been prepared by the Burgh Surveyor for the reconstruction of the Town House. It is proposed to extend the Town House as far as the premises of Messrs. McKilliam, in Broad-street. It is also proposed to acquire the Advocates' Hall buildings. The requirements of all the departments have, it is stated, been provided for. A remit was made to the officials to inquire into the cost at which the property could be purchased. It was also recommended to Mr. Dyack to make the necessary amendments on the plan, and bring them up at another meeting of the Committee. The scheme, it is stated, will involve a cost of about 100,000*l.*

ENGINEERING SOCIETIES.

THE SOCIETY OF ENGINEERS.—At a meeting at the Royal United Service Institution, Whitehall, on Monday evening, the 6th inst., Mr. N. J. West, President, in the chair, a paper was read on "The Transport Possibilities of our Inland Navigable Waterways," by Mr. Benjamin H. Thwaites. The author commenced by observing that the creation of the inland located manufacturing industries of England and the development of our agricultural industry would have been impracticable but for the inland navigable waterways provided by our transformed rivers and canals, the inception of which he traced to King Henry I., and for the construction of which Parliamentary powers were obtained. To the work of the canal engineers, Brindley, Jessop, Telford, Vermuyden, Rennie, and others, and the constructional efforts of the River Conservancy Boards, the author attributed England's possession of a magnificent system of water carriage by which the agricultural areas were connected with the manufacturing centres and the seaports, by which means the development of England's industries surpassed those of France and Spain. One of the effects of the Railway boom in the forties, during which no fewer than 272 Railway Acts were passed, was to almost extinguish the interest of statesmen in our canals, and Parliament by its indifference almost invited the policy of astute railway administrators in attempting to secure the control of the canals that were local traffic carriers and rivals. As a result of that policy, the railway companies absorbed no fewer than 50 canals of more or less importance. Modern statesmen and the public realised from the arguments advanced in favour of the Manchester Ship Canal in 1884-5 that the railway policy of obtaining canal control was entirely against the interests of the trading and industrial community, and, as a result, an Act of Parliament was passed in 1885 to check the canal control propensity. But the Act after all was only an example of the *ex post facto* policy—it came too late. Some of the railway companies have altogether suppressed their canals, parts of which have been converted into railways. The Great Western Railway had relinquished its control over a group of canals, and under more sympathetic control the trade upon them was becoming prosperous. A comparison was drawn by the author between the canal policies of the Governments of Germany, America, and France, which was much to England's disadvantage. The waterways and railways of Germany were State-owned, and the Government was continually extending the lengths and carrying capacities of the canals. Owing, as the German State did, both systems, was a proof that the canals were serviceable to the State, otherwise they would have been abandoned. But the author pointed out that money was to be appropriated to their further development, besides which the railway rates were stated to be 25 to 50 per cent. lower than those of British railway companies. The French Government had used the State-owned canals to check the charges for transport of the privately owned French railways, and the canals were maintained in a high state of efficiency. The author set forth the *prima facie* economic advantages of water carriage compared with those of railway transport in different countries. Even in comparison with the lowest American rates, canal transit costs were stated to be lower, and it was said that the advantage would be increased by the electrification of the canals. Various methods of canal haulage were compared, to the advantage of the electrification principle. According to the author, our existing navigable waterways possess immense potentialities of good for the benefit of our agricultural and staple industries.

THE INSTITUTION OF CIVIL ENGINEERS.—At the ordinary meeting on the 7th inst., Sir Guilford L. Molesworth, K.C.I.E., President, in the chair, it was announced that twelve associate members had been transferred to the class of members, viz., Messrs. C. Brownridge, H. Deans, B.A. (Cantab.), W. Emmott, A. Fidler, A. P. Griffiths, B.Sc. (Paris), H. Japp, L. P. Marshall, H. F. Peet, E. van Putten, J. R. Settle, R. C. Sikes, B.E., B.A. (Royal), F. Wood. It was also reported that nine candidates had been admitted as students, viz., A. S. Ash (London), S. O'G. Cotton (London), F. L. Creswell (London), H. W. Hague (New Parkside, South Australia), K. Newton (London), W. P. Schütte (London), E. I. Spiers (London), A. Trehwiler (London), G. B. Underhill (Canterbury). The monthly ballot resulted in the

election of five members, viz., Messrs. A. M. Henshaw (Stoke-on-Trent), J. S. Highfield (London), G. C. Kenyon (Liverpool), R. B. Morison (Riversdale, Cape Colony), E. Wakeford (Sheerness). Thirteen associate members, viz., G. H. Blacklock, B.A. (Cantab.), (London), W. H. P. Bronger, Stud.Inst.C.E. (Grangemouth, N.B.), C. R. Carr, Stud.Inst.C.E. (Twerton-on-Avon, Bath), R. L. Colbourne, Stud.Inst.C.E. (Lyallpur, Punjab), T. G. Dempster, B.Sc. (Glas.), (Pollokshields, Glasgow), R. P. Hadow, Stud.Inst.C.E. (Malakwal, Punjab), C. I. Hutton, Stud.Inst.C.E. (Insein, Burma), A. D. Jaffé, B.A. (Cantab.), (Chorlton-cum-Hardy, Manchester), F. M. Lawson, Stud.Inst.C.E. (Bristol), H. T. MacLeod, Stud.Inst.C.E. (London), F. H. Matfield, Stud.Inst.C.E. (Gateshead), A. Trewby, B.A. (Cantab.), Stud.Inst.C.E. (London), R. E. Workman, B.Sc. (Glas.), (Manchester). One associate, viz., T. W. Stuart (Liverpool).

BOOKS RECEIVED.

OLD HOUSES IN EDINBURGH.—PART II. Drawn by Bruce J. Home. (S. Bagster & Sons. Is.)

CONSTRUCTIONAL STEELWORK. By A. W. Farnsworth, A.M.Inst.M.E. (Charles Griffin & Co.)

MANCHESTER SOCIETY OF ARCHITECTS SKETCH BOOK. Parts I. and II. Edited by the Sketch-Book Committee.

GENERAL DESCRIPTION OF SIR JOHN SOANE'S MUSEUM. Eighth Edition. 6d.

Correspondence.

THE LONDON BUILDING ACT (AMENDMENT) BILL.

SIR,—Thanks are due to you for the very able comment on one of the petitions against the Bill, but you rather miss one important point when you urge the payment of district surveyors by salary instead of by fees.

These officers have been statutory officers, bearing the same name for over sixty years, and payment by salary would alter their status and make them officers of the Council.

The work varies so much in each district that it would be difficult to settle the salary, while the present system secures payment in proportion to the work done. I would ask your readers to consider the matter from three points of view:—

1. Officials of public bodies start at a certain salary, increased each year, and retirement is followed by a pension for life.

2. The Council proposal would give a fixed salary and retirement without a pension, so that many a man might be ruined by the increase of work in his district and be left to starve while still active and strong.

3. The Metropolitan Board of Works appointed surveyors in accordance with the Building Act, and gave a small district with leave to carry on private practice, thus securing first-rate architect experience to take the appointments. The present system of the Council will secure young and inexperienced men just able to pass the examination, or men under fifty who have been unsuccessful. As years roll on the candidates will grow worse and worse, and nobody of any position will be found to enter the lists. Compare the names of the candidates even now and, say, thirty years since.

ARCHITECT.

"STRUCTURAL TIMBER TESTS."

SIR,—I wish to thank you for your very kind notice of Circular No. 32 of the Bureau of Forestry (see "Notes," page 56 ante). I note, however, that there has been some slip in one statement in the editorial, where it says:—"It is also shown that, when the proportion of moisture exceeds 25 per cent., ultimate strength diminishes rapidly with every increase of the proportion." The statement in Circular No. 32, page 13, is:—"After the moisture has been reduced to nearly 26 per cent., the strength begins to increase upon a further reduction of moisture." From this it may be inferred that any addition of moisture beyond 26 per cent. will not decrease the strength of the stick.

W. K. HART,
Civil Engineer.

United States Department of Agriculture,
Bureau of Forestry, Washington,
Lafayette, Ind., U.S.A.,
February 24, 1905.

WALLASEY COMPETITION.

SIR,—With reference to this competition for municipal offices, it seems fair that the Council should only exhibit the premiated designs and should refuse to publish

the assessor's award? Surely there is no question that the comparison of the various designs and the publication of the award is of distinct advantage to the competitors.

One hears a good deal about the helping hand the R.I.B.A. is supposed to offer to their members. Surely the assessor, as a late President, has sufficient influence to put a little of the Institute's preaching into practice, and induce the Wallasey Council to reconsider its decision and hold an exhibition in the usual manner.

* * * We do not see that a committee is the least bound to publish the assessor's award; it is a private document; but the exhibition of all the designs is very desirable.—ED.

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE-STEEL.—X.

L'EGLISE DE SAINT JEAN DE MONTMARTRE, PARIS.



THE church of St. Jean de Montmartre, built for M. l'Abbé Sobaux, is a very remarkable example of reinforced construction, and, so far as concerns boldness of design, it probably has never been surpassed.

Owing to the fact that Montmartre is a thickly populated and poor quarter of Paris, it was necessary to build a large church at the lowest possible cost. Accordingly, M. A. de Baudot, architect to the archiepiscopal district of Paris, obtained three estimates for consideration, relating respectively to masonry, steel framed, and reinforced brick construction, the approximate cost of the three projects being:—(1) Stone masonry, 155,600*fr.*; (2) steel framed construction, 145,000*fr.*; and (3) reinforced brick and cement construction, on the Cottancin system, 14,000*fr.* After these estimates had been considered by the diocesan authorities, M. de Baudot was instructed to accept the last-mentioned.

We give in Figs. 72, 73, and 74 drawings which will serve to make clear the general character of this building. By reference to Fig. 74 it will be seen that the church is of irregular plan, the total length being 51 metres and the width across the nave and aisles 20 metres or not taking into account the small chapels and other projecting parts. The height of the outer walls is 35 metres, and the thickness of the reinforced brickwork of which they are built is only 11 centimetres (4½ in.). Support for the entire structure is afforded by cylinder foundations, in which are built, as described below, reinforced brick columns with a central core of concrete.

The building comprises two stories, one being the crypt, 10 metres high, and the other the church proper, 25 metres high to the top of the walls. The floor of the crypt is level with the tops of the cylinder foundations, the stiffening ribs and the cement slab of this floor connecting the whole of the foundations so that they form a complete structure. The reinforced brick columns are carried up through the crypt for the support of the church roof, and below the level of the upper floor they are provided with arched ribs, which form a vaulted roof to the crypt. In the church there are galleries and balcony which are supported also by ribs springing from the columns.

The roof of the church is a system of flat domes formed of curved ribs of reinforced brick, with connecting layers of concrete 5 centimetres thick, the whole being reinforced with a reticulated system of steel bars woven in the manner generally illustrated in Fig. 59 ante.

Although the walls receive support in the first instance from the connected system of cylinder foundations, they are so tied together in every part, and so connected with the columns, floors, and roof, that they are self-supporting to a very great extent and are able to span considerable openings without intermediate piers or girders.

These are the main features of the structure, which, owing to the exceedingly daring character of its design, has somewhat undeservedly been designated as "la folie du siècle."

Turning now to the details of construction, we may remark that considerable difficulty was presented by the peculiar conditions of the site. Fig. 76 is a block plan by which it will be seen that the church of St. Jean passes between two buildings 20-62 metres apart, and, as the exterior width of the church at this

part is 20-22 metres, each of these buildings approaches within 20 centimetres of the church. Thus it was impossible to provide for extension of the footings or to strengthen the walls by means of external piers or buttresses, the space available being, in fact, barely sufficient for the width of the building itself.

Notwithstanding the inadmissibility of counterforts, it would have been quite practicable, if the nature of the soil had permitted, to form the foundations by supporting the structure upon a general platform consisting of a series of shallow steel-cored caissons, connected by reinforced brick ribs and a concrete-steel slab. This method is quite suitable for soils of low bearing power, as evidenced by the foundations of the dépôt of the Compagnie Générale des Omnibus, described in a recent article, and also by that of the boiler-house in St. James's Park, Westminster, described in a previous Student's Column series.* But it is necessary that the ground should be uniform in character, even if of unstable quality.

In the case of the site at Montmartre, the sub-soil consisted of nothing better than loosely-compacted quarry debris, exceedingly liable to form cavities of considerable size if any movement of the material took place. The difficult nature of the problem was further accentuated by the unfavourable profile of the site, which is sketched in Fig. 75. At the point C the level for the crypt floor was at 1.60 metres above the passage of l'Elysée des Beaux-Arts, which forms one boundary of the site. Then came a piece of comparatively level ground CA, and after it a slope AB, consisting of quarry debris, and next, at 12.00 metres above the passage of l'Elysée des Beaux-Arts, the Place des Abbesses, on which the front portion of the church now

stands. The ground plot as a whole rests upon a stratum of argillaceous gypsum, and the part between the points A and C was found to be traversed by deep fissures, descending in some cases almost to the level of the River Seine and filled with rubbish.

In consequence of these unpromising conditions, it was decided to construct a foundation platform of unequal depth to suit the varying quality of the substratum at different parts of the site. As stated above, the structure is carried on reinforced brick columns, the positions of which are indicated on the ground plan (Fig. 74). Beneath each of these points a well was sunk for the reception of a hollow cylinder of reinforced cement. After being completed, the cylinders were filled to the height of 8 metres with earth excavated during the sinking of the wells, and upon the filling of each a slab of reinforced cement mortar 5 centimetres thick was formed to close the cylinder at 4 metres below the surface and to form a column base-plate, the reinforcing bars of the slab being firmly connected with those of the cement-steel cylinder. Upon the reinforced panels the columns were built up, and then the upper part of each cylinder was filled with ordinary concrete. By adopting this system of foundation, although at the depth of 12 metres the ground was still composed of quarry refuse, the bottom of the cylinders was lower than the galleries of the disused quarries, and there was no longer any risk that dangerous cavities would be formed by shifting of the underground material.

At the distance of 30 centimetres below the top of the cylinders a triangulated system of reinforced brick ribs was built from cylinder to cylinder, and the reinforcing bars of these were connected with a network of steel extending over all the ribs, this network being

embedded in a layer of cement mortar forming a continuous floor slab for the crypt. The ribs and slab together serve to connect all the cylinders, and thus a monolithic foundation was secured, representing a combination of the cylinder and the caisson systems. Further strength was obtained by securely tying together the reinforcement of the cylinders, the column base-plates, the columns, the ribs, and the floor slab, all these connexions being made during the execution of the cement, concrete, and brick work. The shallow parts of the foundation are quite adequate for supporting the light loads coming upon them, while the cylinders, forming cells of great depth, are able to withstand the heavy loads due to the main framework of the church. Moreover, as the tubular form possesses great resistance to stresses radiating from the centre, no forces acting in horizontal directions are communicated to the ground, and the great depth of the cylinders renders them safe against the effects of any slips taking place in the loosely compacted mass through which they pass.

The columns, commencing at 4 metres below the top of the foundation, rise first to the under side of the floor which covers the crypt, the sides of the column being parallel and perpendicular to the axis of the building. At the height of about 5.50 metres above the crypt floor curved ribs spring from the sides of the columns and pass from one column to another, as shown in Fig. 74. These ribs form the vaulted roof of the crypt. As the ribs are merely extensions of the columns, and as one neutralises the thrust of another, there is practically no lateral force calculated to cause flexure of the columns. Each column acts the same part as the pillar carrying the beam of a pair of scales, as the tower of a suspension bridge, or as one of the steel towers of the



FIG. 72.

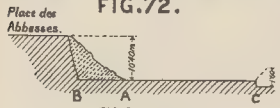


FIG. 75.

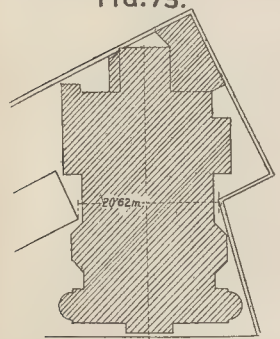


FIG. 76.

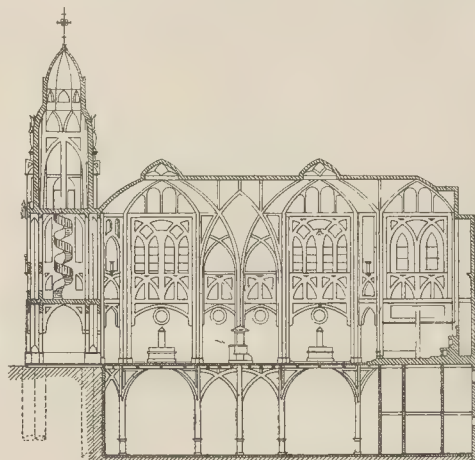


FIG. 73.

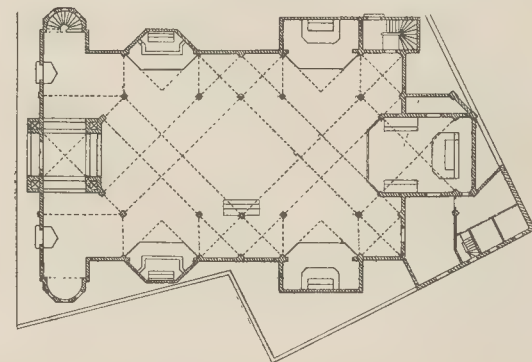


FIG. 74.

Illustrations to Student's Column.

* The Builder, vol. lxxxv., p. 526.

Forth Bridge, supporting two cantilevers of equal length and weight. The result is that the column remains in compression and the forces tending to produce flexure are negligible. In the church above the crypt the columns take a turn of 45 deg.—that is to say, each column is twisted at the floor level so as to suit architectural requirements. In ordinary brickwork this treatment would be impracticable, and the result could not be satisfactory from the point of view of strength. In reinforced construction, as we shall show a little later, there is no difficulty of any kind.

The principle of branching out the columns is applied in the church on a far larger scale than in the crypt, and reference to Fig. 73 will show that the columns and their ribs, extending like the branches of a great tree, practically carry the greater part of the roof structure. In fact, their spreading arms are the ribs forming the framework of the domed roofing system. Thus it will be realised that the main idea of the construction we are now considering is that it stands on bases firmly rooted in the ground, the bulk of the weight is carried by stems stretching forth rigid yet elastic arms at different heights, the arms of the different stems being so tied and connected together by the intervening fabric that the whole group forms a single self-contained structure, getting no extraneous support save that of the ground on which it stands and in which it is rooted.

Next week we propose to give further details of the methods adopted in the design and construction of this interesting building. [x]

COURT OF COMMON COUNCIL.

THE usual fortnightly meeting of the Court of Common Council was held at the Guildhall on Thursday last week, the Lord Mayor presiding.

London Building Acts Amendment Bill.—A petition was received from the City and West-end Properties, Ltd., the Consolidated London Properties, Ltd., and the Metropolitan Properties Company, Ltd., asking the Corporation to take such steps as they thought necessary to oppose the passing into law of this Bill. The petition was referred to the special committee appointed to consider the matter. The Town Clerk laid before the Court the resolutions passed at the various ward-motes against the Bill.

Bills in Parliament.—The Streets Committee submitted a report relative to a number of Bills in this session of Parliament. The Committee was authorised to oppose the following Bills, among others, if necessary:—Central London Railway, North-East London Railway, Great Northern, Piccadilly, and Brompton Railway (No. 2), Hammersmith, City, and North-East London Railway, Administrative County of London and District Electricity Power Company, and Central Electric Supply Company. A number of other electric lighting Bills were included in the list. It was agreed to support the London County Council's London Gas Bill.

Embankment Tramways.—It was reported that a letter had been received from the Town Clerk of Camberwell enclosing a copy of a resolution passed at a Town's meeting held recently, in favour of the proposal of the London County Council to construct tramways across the Thames bridges and along the Victoria-embankment. Mr. A. H. Barber moved that the Bridge House Estates Committee should consider and report upon the subject, and this was agreed to.

METROPOLITAN ASYLUMS BOARD.

THE ordinary fortnightly meeting of the Managers of the Metropolitan Asylums District was held at the offices, Victoria-embankment, on Saturday last week.

Among the correspondence received from the Local Government Board was a letter authorising the execution of certain works for the purpose of lighting Belmont Asylum by electricity, and the provision of telephones and fire alarms, at a cost not exceeding the sum of £6,450l.

Southern Hospital.—On the recommendation of the Works Committee, it was agreed to apply to the Local Government Board for permission to invite tenders for the installation of proposed systems of electric lighting, telephones, and fire alarms at this hospital. The cost is estimated to be 9,000l.

Eastern Hospital.—On the recommendation of the Hospitals Committee, it was agreed, subject to the approval of the Local Government Board, to adopt the plans submitted by the Engineer-in-Chief of the proposed new boiler-house, destructor, and chimney shaft at

this hospital. The engineer's estimate is 4,100l., including the extra machinery.

A revised scale of wages for artisans and certain other employees of the Board was submitted by the Asylums Committee, and agreed to.

OBITUARY.

MR. BRODRICK.—We announce with regret the death, at Gorey, Jersey, of Mr. Cuthbert Brodrick, at the age of 83. Mr. Brodrick gained, half a century ago, a high reputation for his fine design of the Leeds Town Hall, erected in 1853-8 at a total cost of about 130,000l.; it was opened by Queen Victoria on September 7, 1853. Of other buildings planned and designed by him we may mention the Town Hall, in Lowgate, Hull, erected in 1862-6, and illustrated in the *Builder* in the article on "Hull," one of our series, "Architecture of our Large Provincial Towns"; the Royal Institution, Hull; the Corn Exchange, Call-lane, Leeds, built in 1861-3 for the Corporation, and comprising fifty-six sets of offices, newsrooms, etc.; the premises of the Leeds Mechanics' Institute and Literary Society, in Cookridge-street, with library, fine art gallery, and a lecture hall, having a capacity for 1,200 persons; and the Oriental and General Baths, in Cookridge-street. Mr. Brodrick had long ago, we believe, retired from practice, as we learn from the *Yorkshire Post*, resided for a good many years in France. His great building in Leeds will always rank as one of the best examples of the classical revival in England.

MR. FOWLER JONES.—Mr. George Fowler Jones, formerly of No. 8, Lendal, York, died, aged 87 years, at his residence, Quarry Bank, Malton, on March 1. He was elected a Fellow of the Royal Institute of British Architects in 1866.

MR. SCOTT.—Mr. Robert Sinclair Scott, of Burnside, Largs, N.B., died suddenly at the Central railway station, Glasgow, on February 28, in his 64th year. He was the second son of the late Charles Cunningham Scott, of Halkhill, and member of the firm of Messrs. Scott & Co., of Greenock, engineers and shipbuilders. Mr. Scott was Chairman of the Leeds Forge Company, and President of the Engineers' Federation of Great Britain. He leaves a widow and two sons.

MR. H. T. NEILSON.—Mr. H. T. Neilson, quantity surveyor, of Darlington, died at Saltburn recently, at the age of 59. He was a son of the Rev. Horatio Neilson, of North Witham, Lincolnshire.

GENERAL BUILDING NEWS.

CHURCH, LLANDILO FAW, CARMARTHENSHIRE.—The parish Church of St. Teilo was re-opened by the Bishop of St. David's on the 3rd inst., after the addition of a new organ chamber, and after being restored and renovated from the designs and under the supervision of Mr. David Jenkins, architect, Llandilo. The general contractors were Messrs. Thomas Brothers, of the same town; contractors of specialities—Messrs. Roger Lewis, Ltd., of Exmouth, for the maple wood block flooring; Messrs. W. Godwin & Son, Hereford, for the encaustic and tessellated tile pavings; Messrs. Wake & Dean, Ltd., Yatton, Somerset, for the oak choir stalls; Messrs. Alfred Gardiner, Sons, & Co., Ltd., Bristol, for the brass altar rails and standards; Messrs. Williams & Son, Llandilo, for the cleaning, repainting, and gilding work; Mr. D. Pritchard Davies, Llandilo, the installation of electric light; Messrs. Saunders & Taylor, Ltd., Manchester, the heating apparatus; Mr. G. Vowles, Bristol, the rebuilding of the organ. The aggregate cost was 2,500l.

CHURCH, HOWEY, RADNORSHIRE.—A new church was dedicated at Howe, in the parish of Diserth, recently. The new church is built of stone, and the dressings are in terra-cotta, by Mr. J. C. Edwards, Ruabon. The red steps are the Old Radnor Company's patent material, and the floor is in wood blocks, oak the chancel, by Messrs. Geary, Walker, & Co. The roof is exposed timber work in pitch-pine, and the roofs are covered with tiles. The church consists of a nave, chancel, vestry, and south porch, and seats 100 worshippers. The division of chancel and nave is marked by a roof truss brought rather low down and finished on ogee brackets, resting on slender stone columns, with cast-iron capitals. The church fittings, in fumed oak, are by Eaden. The contractor was Mr. S. A. Bounds, of Llandrindod Wells, and the architect was Mr. R. Wellings Thomas.

ALL SAINTS' CHURCH, GRIMSBY.—The new Church of All Saints, Grimsby, has just been dedicated. The nave has three aisles, and there are six arches on either side, while the baptistry opens into the nave by three other

arches. At the entrance to the chancel is a wide arch flanked by two arches of less dimension, those on the north opening into the organ chamber, and those opposite into a side chapel. Choir and clergy vestries are under the east windows of the chancel. Seating accommodation has been provided for 700. The side chapel will accommodate forty-eight in addition to the 700 in the nave. The church is fitted with the electric light. At the west front a gable accommodates the bell. The walls are of red brick, the door and window openings being faced with Monk's Park Bath stone. The internal structural features are of Bath stone, and the walls covered with celadine cement. The church has been built by Messrs. Bowman & Sons, of Stamford, to the plans and specifications prepared by Messrs. J. E. K. & J. P. Cutts, architects, London.

BAPTIST CHURCH, SUTTON.—The new Baptist Church in Balacava-road will seat 400, and has been erected by Mr. F. Hawkey, of Brighton-road, from designs by Mr. Alfred Mason. The cost has been about 2,550l.

NEW VESTRY AND ORGAN CHAMBER, ASHURST PARK CHURCH, KENT.—The Parish Church of St. Martin, Ashurst, has recently had a new vestry and organ chamber built in the north-west side of the church as a memorial of the late Geo. Field, of Ashurst Park, the work being carried out at the instance of Mr. C. A. Morris Field, and the Hon. Mrs. Field, the architect being Mr. Geo. Fellows, Barrister, of Westminster, and the contractor, Mr. Hink of High Wycombe. The additions to the church have been carried out in sandstone, with Bath stone dressings.

NEW CHANCEL, ST. JOHN'S CHURCH, RICHMOND, SURREY.—The Lord Bishop of Rochester consecrated, recently, the new chancel of the morning chapel of St. John's Church, Richmond. The total cost of the extension has reached about 3,500l. The new portion of the building, which has been erected by Messrs. Doray & Co., of Brentford, from designs by Mr. Arthur Grove, architect, consists of a chancel 28 ft. 6 in. long by 25 ft. 6 in. wide. The choir stalls being extended to the east wall, the total length of 40 ft. from the east wall to the chancel screen, and the chancel is lighted by two lancet and two clerestory windows. The morning chapel, 28 ft. 6 in. by 18 ft., is lighted by two windows. As to the scheme of decoration of the only portion at present carried out, the series of paintings on the walls of the nave depicting "The Stations of the Cross," by Mr. Westlake, R.A.

CHURCH HALL, PLAISTOW.—St. Mary's, Plaistow, new church hall has been erected at the London-road end of Farwig-lane. The building consists of a large hall, 72 ft. by 38 ft., which will afford accommodation for 400 persons. There are two classrooms, 20 ft. by 15 ft. 6 in. and 20 ft. 6 in. by 17 ft. respectively; a boys' club and a men's club, each 50 ft. by 28 ft.; a kitchen and other offices are also provided. The heating has been carried out on the hot-water system, and the electric-light installation in the hall and electric-light classrooms has been executed by Messrs. Croydon, on behalf of Mr. T. D. Bishop. The other rooms are lighted by gas. The hall and its adjoining rooms have been erected in accordance with the plans prepared by Mr. Ernest Newton and Mr. Arthur King, and the contract for the execution of the work was secured by Mr. T. D. Grady, Bromley.

RENOVATION OF R.C. CHURCH, BERWICK.—The scheme of reconstruction, which has been proceeding for some months past at St. Cuthbert's Roman Catholic Church, Ravensdowne, Berwick, has now been completed. Its original form has been preserved, but architectural effect has been obtained by heightening the ceiling, and by introducing three triple-light windows into the sanctuary. A sanctuary arch has been introduced. The mouldings spring from triple shafts with carved decorated caps, while the spandrels are relieved by sunk tracery. The north wall, in which there are no windows, has been decorated by the introduction of an arcade of pierced wood tracery arches, rising from the wall on wood corbels. This treatment continues round the three sides of the apsidal sanctuary, and in the panels formed are inserted the three traceries by dows. The gallery has been enlarged by being cantilevered out in the middle, in the form of a three-sided bay. The work is of wood, with cusped panelling. The work is from the designs of Messrs. Kelly & Dickie, architects, London, and has been carried out by Messrs. John Cockburn & Sons. The painting of the church is the work of Mr. John Crow.

BOARD SCHOOL, AYE.—The Newton Park School, erected by the Ayr School Board, has just been opened. The new building, which has been built from the design of Mr. John

Egleham, architect, Ayr, is of Ballochmyle red stone. The site occupies 3 acres of the southern part of the old Public Park of New- town. The main school is a two-story structure, having places for 840 children in six double standard rooms, with 120 places for each of the six standards, and three rooms, each to accommodate forty merit certificate pupils. In addition there are cookery-rooms, gymnasium, headmaster's room, and rooms for the teaching staff, as well as lavatories and cloak- rooms for the children and the teachers. The rooms for the school is a one-story building having places for 250 pupils in five rooms. In each school there is a central hall. The two schools are grouped into one mass of build- ings, and there is a staircase at the junction of the two schools which is carried up to form of the playground. There are playgrounds, terraces, and playsheds for the several divisions of the schools. The contractors were as follows:—Mason work, W. Watson & Son; joiner work, David Milligan; cast-iron and steel work, J. Lindsay Copland; plaster work, M'Ilwraith, Cowan, & Co.; plumber work, James Fraser; plaster work, Matthew Glen; painter work, J. H. Fulton; all of Ayr. The total cost of the school, exclusive of site, has been about 12,000.

PROMISED Y.M.C.A. BUILDINGS, CUPAR, N.B.—Plans have been prepared by Mr. Charles Suter, architect, Dundee, for the proposed new premises of the Young Men's Christian Association at Cupar. The structure, on the ground floor, will comprise a hall, with cloakroom and lavatory accommodation adjoining for ladies and gentlemen; and on the upper floor two smaller halls, separated by a swinging partition, and a committee or reading room. The frontage to Ladywynd will be built of red terra-cotta brick, with a base course and facings of red Dumfriesshire stone.

NEW COTTAGE HOMES AT LANCHESTER.—New cottage homes for children have been built by the Guardians adjacent to the Workhouse at Lancheater. The new buildings, which face the main street running through the village, have been built by Messrs. Robson & Sons, of Ebb and Waterhouses, from the designs of Messrs. W. Lister Newcombe & Son, archi- tects, of Newcastle, while the work has been supervised by Mr. T. March, of Blaydon, clerk of the works. At present only two blocks of houses have been built, comprising two cot- tage each, and will accommodate sixty children, or fifteen boys and girls in each cottage.

PUBLIC HALLS, KINGSTON, GLASGOW.—The new halls at Kingston, which form a part of a scheme for the erection of public library and police office, were opened recently. The accommodation provided is as follows:—A large hall to seat 1,000, a lesser hall to seat 350, a lower hall or buffet to seat 100, eight kitchens, two cloakrooms, a store for seats, and conveniences. The large hall, which is situated on the upper floor, is reached by a staircase, the walls of which are tiled, and the floors of the entrance-hall and landings are laid with terrazo. The galleries of this hall are built on the cantilever principle. The lesser hall is situated on the ground floor, and may be entered either from Paisley-road or the lane to the side. The buffet-room, cloakrooms, and rest-rooms are placed in the basement. The whole buildings are heated on the low-pressure hot-water system, and the vitiated air is extracted from every apartment by means of two electrically-driven fans. The building is Renaissance in style. The pre- paration of the plans and the erection of the building have been conducted under the per- sonal supervision of Mr. McDonald, the City Engineer.

LIBERAL CLUB, PENRITH.—The new Liberal Club at Penrith was opened on Monday. On the ground floor are the caretaker's rooms and a coffee-room. Underneath these apart- ments are cellars containing the heating ap- paratus. A staircase, which gives access to the trade, leads from the entrance-hall to the first floor, on which is a reading-room, a ladies' drawing-room for the use of the Women's Liberal Association, and an assembly-room for meetings and concerts and the like, which can be approached by a separate entrance. On the next floor is a billiard-room. Adjoining are lavatories; also a dark-room for amateur photographers. On the floor below there are a couple of bathrooms. In addition to the apparatus for heating, the various apart- ments contain tiled fireplaces. A suite of offices with a separate entrance, form part of the building, which was designed by Mr. George Watson, architect.

WORKMEN'S HOTEL, BIRMINGHAM.—The erection of the new workmen's hotel at Bir- mingham has now been completed. The structure is modelled on the lines of the

Rowton Houses in London, and is built of red brick, with buff terra-cotta dressings. The entire cost, with appointments, is about 62,000. The building in its full length runs parallel with Highgate Park, and has its entrance in Alcester-street. Accommodation on the cubicle system is provided for 512 men. The building has wide forecourts on each of the frontages to Alcester-street, Moseley-street, and Highgate Park, and there is an inner courtyard, 90 ft. wide, which is open at one end. All the dayrooms used by the lodgers are above the road level in Alcester-street, and have an outlook over the park. Most of the interior walling is of cream and chocolate glazed brick. There are five floors of cubicles, each of which has its own window under the control of the lodger. The building contains a reading-room, measuring 2,503 sq. ft., smoke-room, and writing-room. There is also a library. The dining-room, on the right side of the main corridor, provides accommodation for 450 men. The walls are built with a high dado of cream and chocolate-tinted glazed brickwork, with plastering above, tinted to a shade of terra-cotta. Mr. H. B. Measures was the architect of the building, Mr. T. Johnson being the builder, and Mr. A. Yates the clerk of the works.

BANK, BRISTOL.—The new premises which form the Red-rod branch of Messrs. Stuckey's Banking Company are situated in White Ladies-road. The building has been erected at a cost of about 6,000, and is built of Monk's Park stone. The main doorway, on each side of which there are cast bronze tablets, is 7 ft. 6 in. wide, the height, from the pavement to the top of the pediment being 25 ft. On the ground floor is the banking hall, 45 ft. by 35 ft., with fittings of oak and Spanish mahogany, and at the rear are situated the manager's bookrooms, strongroom, lavatories, etc. The upper portion of the building is fitted for dwelling purposes. The premises are fitted throughout with electric light. The architect was Messrs. R. Milverton Drake & John M. Pacey, of Bristol.

CUSTOMS HOUSE, PORT TALBOT.—The new Customs House and shipping office at Port Talbot, which were recently opened, adjoin the Port Talbot Railway and Docks Com- pany's general office in Station-road. On the ground floor the main entrance leads into a hall, having the shipping office on the left and King's warehouse and storeroom on the right. The side entrance, in Eagle-street, leads into the seamen's waiting-room, seamen's shelter, and seamen's yard. The first floor, consisting of the long-room, collector's office, book-rooms, and lavatories, is entirely self-supporting and fireproof, and is constructed of rolled-steel joists, overlaid with expanded metal sheets and cement concrete. The entire surface of the seamen's yard and main yard is laid with asphalt on a substratum of cement concrete. The engineer responsible for the building is Mr. W. J. Hogood, Chief Engineer of the Port Talbot Railway and Docks Company. The contract has been carried out by Messrs. John Davies & Sons, contractors, Aberavon. The cost of the new building is 1,450.

SANITARY AND ENGINEERING NEWS.

SEWAGE FILTER, WEDNESBURY.—The Wed- nesbury Corporation Sewerage Works Com- mittee have issued a report by Dr. Bostock Hill on the results of analyses of the effluent from the new coal filter at the sewage works at Bescot. This states that the results were in every sense highly satisfactory, nearly every sample showing an improvement on the pre- ceding one, and the worst result was a good one. The percentage of purification effected was probably as high as at any works under similar conditions in the country, and the Cor- poration, in view of the success of the coal filter already laid down, are recommended to proceed with extensions on similar lines. An object-lesson in the degree of purity obtained was the fact that fish which had been turned into the effluent were thriving there. Messrs. Dodd & Dodd, of Birmingham, are the Council's Engineers.

ELECTRICITY WORKS, CARNARVON.—The new electricity works at Carnarvon, which are situated between the harbour and the railway station, were opened a short time ago. The whole of the contract has been carried out for the corporation by the National Electric Con- struction Company, Ltd. The plant consists of two Darcy-Paxman "Economic" boilers of 7,000 lb. per hour evaporative capacity; two Peache high-speed engines direct, coupled to two "Lancashire" 100 K.W., generating sets with balance and booster; a Hart battery of 400 ampere hours capacity, and a 96 tube "Green" accumulator. Cables have been laid along all the main thoroughfares with exten- sions into principal streets, and supply is arranged on the three-wire continuous current

system of 230 volts. Fifty services have already been connected. The building, con- sisting of a boiler-house, engine-room, battery- room, offices, etc., is of a steel frame- work of vertical H-section stanchions and light steel roof trusses, the spaces be- tween the stanchions being filled with a screen of brickwork, the floors being of concrete and expanded metal. The whole of the structure has been carried out by Messrs. Heenan & Froude, of Manchester and Wor- cester, under the supervision of Mr. S. Wilkinson.

WATER SUPPLY, WALLASEY.—New waterworks, consisting of a covered service reservoir, a lower with overhead tank, and the requisite mains, have been constructed at Wallasey for the purpose of providing that district with an extra supply of water from Liscard. The reservoir has a containing capacity of about four and a half million gallons. Without losing sight of the utility of the works, every which would not be an eyesore or a detriment to the surrounding property, and accordingly embankments suitably planted with shrubs have been formed. The tower is octagonal in form, and provided with a turret, within which is a winding staircase to a platform over the tank, which is 250 ft. from the sea level. The works have been designed by Mr. J. H. Crowther, Gas and Water Engineer to the Council, and the contract for the work was carried out by Mr. J. Gourley.

ELECTRICITY WORKS, BRIDLINGTON.—The new Bridlington electricity works were opened on the 2nd inst. The scheme, prepared by Mr. F. H. Medhurst, who was appointed consult- ing engineer, has cost about 30,000. The buildings, designed by Mr. E. R. Matthews, the Borough Engineer, are situated in a central position close to Elms estate, between the old town and the Quay. Three cables radiate from the works to the different centres, and there are thirty miles of cables for all pur- poses. The street lighting consists of 410 in- candescent lamps of varying candle-power, and thirty-two arc lamps. Sixteen of the arc lamps are 12-ampere open-type of 3,000 candle- power each, and the remainder 500 candle- power 3-ampere open lamps. The water which, in the process of excavation, inter- fered with the progress of the work has been collected by special drains into a large sump, and is used for feeding the boilers, thus avoid- ing the necessity for well-sinking. Another feature is the method of controlling the street lighting, the whole of which is switched on from the station.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—Stuart's Granolithic Stone Company have removed their offices from 49, Deansgate, Man- chester, to Great Bridgewater-street, Man- chester.

SANDERS' ESTATE, DENMARK HILL.—At their meeting last week the Camberwell Borough Council agreed to vote a sum of 10,000, to- wards the purchase of the Sanders' Estate which a local committee seek to acquire as an open space for the public benefit, under the name of Ruskin Park, in memory of John Ruskin, who passed the earlier years of his life in an adjacent house. The land consists of some 24 acres, with lawns and well-wooded grounds, lying on the western slope of Den- mark Hill, and has a frontage of 1,000 ft. to the main road. The old detached houses and pleasure-grounds at Denmark Hill are gradually giving place to new roads and streets. The land round about is being sold at a high price; some ground adjoining the property in view has lately realised 5,000. per acre, but it is stated that in the case of the Sanders' Estate Mr. Frank Trier's local committee, who are supported in their endeavours by the Commons Preserva- tion Society, have succeeded in staying some contemplated building operations, with an option, to be exercised within a certain limit of time, of buying the property at the price of 2,000. per acre; private contributions to the fund already amount to 4,300. The new King's College Hospital will be erected on some ground contiguous to the proposed Ruskin Park.

SHEFFIELD MASTER BUILDERS' ASSOCIATION.—On the 28th ult. this Association held its annual dinner in the hall of the Builders' Exchange, in Cross Burgess-street, Sheffield. The chair was taken by Mr. A. Mastin, Presi- dent of the Association, and he was supported by Alderman Wheatley, Alderman Jessop (Huddersfield), Mr. C. F. Wike (City Sur- veyor), Dr. Scourfield (Medical Officer of Health), Mr. A. Moulson (Bradford, President of the Yorkshire Builders' Federation), Mr. J. L. Taaffe (secretary), and others. In pro- posing the toast of "The City and Trade of

Sheffield," Mr. A. J. Forsdike deplored the fact that the building trade was not more directly represented on the City Council. Possibly that was because the builders were too timid to enter into such a sanctum sanctorum, or else they were too much occupied in their own businesses. While the trade in Sheffield was at present not very good, they were able to congratulate themselves that there were signs of an improvement.—Alderman Wheatley responded. In relation to the increase of the salaries of some of their officials, he thoroughly deprecated the parrot-cry raised by some members of the Corporation as to highly-paid officials. Alderman Wheatley went on to say that he was opposed to so much direct employment of labour by the municipal authority. In his opinion the Council did not get the best results from some of its workmen. He was not referring to officials, but to the actual workmen. Very frequently some of the latter thought when they were employed by the Corporation they had dropped on a soft spot. Further reply to the toast was made by Dr. Sourfield.—Mr. Cook proposed "The National and Yorkshire Federation of Building Trade Employers." He described the present condition of conducting business as being largely due to the influence of the Federation. During a long spell of bad trade there had been no attempt to reduce the wages of their employees, but the aim had been to give a fair day's pay for a fair day's work. He hoped that strikes and lock-outs would soon be things of the past. The great advance in the principle of conciliation was largely due to the efforts of the National and Yorkshire Federations.—Alderman Jessop, of Huddersfield, expressed the opinion of the National Federation, responded, and referred to several Bills affecting the building trade which were to come before Parliament. In the matter of the proposal to fix a minimum wage he intimated that unless there were also stipulations as to a fair day's work such legislation would be altogether unfair. Mr. A. Moulson, of Bradford, also responded.—The health of the architects and surveyors of Sheffield was proposed by Mr. J. Biggin, who declared that the great need to-day in Sheffield in reference to building was not for houses for the poorer class of people who only earned from 15s. to 20s. a week.—Mr. C. F. Wike replied, and congratulated the members of the Association on the fact that the condition of the building trade was likely to improve very shortly, as was shown by the plans deposited in his department. It was noticeable that thirteen large firms have given notification of extensions to their works.—Messrs. A. E. Turrell and G. R. Wigfull also spoke in reply to the toast.—"The Sheffield Master Builders' Association" was proposed by Councillor Dawson, of Huddersfield, and the President, Mr. A. Mastin, replied.—The toast of "The Visitors" was proposed by Mr. T. Roper, and responded to by Mr. J. J. Bingham.

BRIGHTON MASTER BUILDERS' ASSOCIATION.—The twelfth annual dinner of the Brighton Master Builders' Association was held at the Hotel Metropole, on the 2nd inst. The company, with guests and master builders, numbered some eighty. Alderman W. Botting, J.P. (the Chairman of the Association), presided, and the guests included the Mayor of Brighton (Alderman F. Blaker). The loyal toasts having been honoured, Mr. T. P. Harker proposed "The Corporations of Brighton and Hove." In responding, Alderman Blaker congratulated the Association upon the strength in which they found themselves. Speaking of the coming motor week, he said he knew of nothing that had taken place during the last few years which was going to tend more to create the popularity of Brighton than that week.—Councillor Cresswell, who also responded, thought the Brighton Corporation had now a splendid opportunity to turn the Aquarium into a winter garden.—The toast of the evening, "The Association of Master Builders," was proposed by Mr. G. S. Godfree. He believed the Association arose out of the initiation or the inception of a strike that took place in Brighton some twelve years ago. He had no doubt the men who then struck, like the builders themselves, were pleased with the result and the outcome—that Association. Rebut and the Chairman said the Association had two branches to it—the Master Builders' Association and the Master Builders' Insurance Company. At the present time they had plenty of funds for all they wanted. The Insurance Company had been exceedingly successful. They started without a penny-piece, and to-day they had 7,300, odd from which to pay any claims that might be made upon them. Their income last year was 8531., and the claims made came to 751. Out of the 7,300, some 4,000, had been invested on mortgage at 4 per cent. They had nearly reached 8,000,

and when they did he thought that would be quite enough to protect them. They had settled up everything without litigation.—Responding to "The Visitors," honoured at the instance of Councillor Holloway, Alderman Marx facetiously observed that in the matter of bills builders ought lawyers.—Councillor Wilson proposed "The Health of the Chairman," and Alderman Botting, in replying, thanked the committee for the excellent help they always gave him.

LLANDUDNO AND DISTRICT BUILDING TRADES EMPLOYERS' ASSOCIATION.—The annual dinner of the Llandudno and District Building Trades Employers' Association was held at Llandudno on the 23rd ult. Mr. Evan Hughes, chairman, presiding. Mr. H. Lever (Liverpool), chairman of the Lancashire, Cheshire, and North Wales Builders' Federation, who alluded to the necessity for organisation by the master builders in view of the perfection of the organisation of the workmen, though he disclaimed any aggressive spirit, thought the best way of settling disputes was by discussing the matters of difference amicably round a table. The "inter-trading" rule had largely increased the membership of the associations wherever it had been adopted. Under it members only gave or took tenders from those who were members of the local association or an affiliated association. On the question of insurance of workmen also the Federation had been of service, and the members had now practically an assurance in which they could have confidence.—Councillor J. O. Thomas, chairman of the Urban District Council, remarked that, notwithstanding the imposing and beautiful architecture of the more modern quarters of Llandudno, the work done by the original builders of the place, compared very favourably with it.—Mr. G. A. Humphreys, Lord Mostyn's agent, referred to the new building by-laws which the Council propose to issue, and remarked that some of them were not practical; but he hoped, with the assistance of the Association, the new code would be made quite reasonable and satisfactory in all respects before it came into operation.

BOURNEMOUTH MASTER BUILDERS' ASSOCIATION.—The seventh annual dinner in connexion with the Bournemouth and District Master Builders' and Decorators' Association was held at the Hotel Metropole, Bournemouth, on the 18th ult. The chair was occupied by the President (Mr. D. Drake), and among those present were the Mayor (Alderman J. Elmes Beale, J.P.), Messrs. W. G. Cooper (Chief Sanitary Inspector), F. P. Dolamore (Deputy Borough Surveyor), and T. Doggrell (Southampton Master Builders' Association).

THE LONDON BUILDING ACTS (AMENDMENT) BILL, 1905.—The Works and General Purposes Committee of Hackney Borough Council reported, on Monday, having passed the following resolution:—"That, in the opinion of this authority, the passing of the London Building Acts (Amendment) Bill, 1905, would, apart from its interference with the powers and duties of the metropolitan borough councils, tends to further confuse and increase working difficulties of the present laws relating to streets and buildings in the Metropolis. In our judgment, the Bill should be withdrawn and a new measure introduced, consolidating into one Bill all the statutory provisions necessary for governing the formation of streets and buildings, simplifying the present laws, and relegating to the borough councils all duties which, in the opinion of Parliament, may properly be entrusted to them, and thus relieving the London County Council of some portion of the enormous burden of work cast upon it."

TEST OF A FIREPROOF FLOOR AT HALIFAX.—At the request of Mr. James Lord, Borough Engineer of Halifax, the Stuart Granolithic Stone Company, Ltd., of London, submitted to actual test one of the fireproof floors erected by them at the new Wesleyan Sunday School, King Cross, Halifax, under the direction of the architect, Mr. A. G. Dalzell, of Halifax. The portion of the flooring selected for the test, whilst not the largest area between supports, was undoubtedly the weakest in the building, a slab in an overhanging mezzanine passage, 9 ft. clear bearing, 5 ft. 6 in. wide, supported at each end by a 5 in. steel joist, and on the wall side by a 2 in. groove in the wall. The slab was put in during October, 1904, after the building had been roofed in. The slab was weighted with 3 tons 3 cwt. of cement in sacks, a net load of 2 cwt. per sq. ft., and the deflection at the centre of the slab on the outside edge, under this load was one-sixteenth of an inch, and before the load had been half removed this deflection disappeared. As it was not desired to cause any distress in the slab the load was not further increased, but as the load applied

represented more than double the probable future load, the test was deemed perfectly satisfactory. The test was superintended by Mr. Goldthorp, the Corporation Building Inspector, and was watched, on behalf of the contractors, by Messrs. Leslie, Munro, & Ashel Stuart, Mr. A. G. Dalzell, the architect, also being present.

THE "RECK" SYSTEM OF HEATING.—Messrs. G. N. Haden & Sons (Trowbridge) write that they are the sole agents for the United Kingdom for this system of heating, Messrs. James Boyd & Son having control of the patent under Messrs. Haden's licence for Scotland and Ireland only.

PROPOSED CHURCH RESTORATION, RAMSGATE.—A public meeting was held recently at the Town Hall, Ramsgate, to consider proposals for the restoration of St. George's Church. Reports upon the condition of the church, prepared by Mr. W. D. Caroe, and Mr. S. H. Page, of Ramsgate, who is acting with Mr. Caroe in regard to St. George's Church, were submitted.

BRITISH FIRE PREVENTION COMMITTEE.—The Committee conducted a series of official tests on Wednesday. Amongst those present were:—Mr. Gavey, Chief Engineer, General Post Office; Mr. Redgrave, of the Home Office; and the Engineer from H.M. Office of Works. Mr. H. H. Collins represented the Council of the Committee, and the Chairman and Hon. Secretary, and several members of the executive were in attendance. The first test was subjected to a fire test of three-quarters of an hour, followed by the application of water. The third test was with a thin 2½-in. slab partition, intended to attain full protective classification for thin work of this description. During the course of the afternoon some private tests were also made with sprinkler heads, and with an automatic fire alarm system. The official reports on these tests will be issued in April.

CAPITAL AND LABOUR.

ABERDEEN PAINTERS' STRIKE.—The Aberdeen house and shop painters, numbering 250, came out on strike on the 1st inst., their demand for a standard rate of 8d. per hour and an advance on the country rate of pay being refused.

Legal.

SCAFFOLDER'S ACTION AGAINST BUILDERS.

The case of Coker v. Green came before Mr. Justice Darling and a special jury, in the King's Bench Division, on the 1st inst.—an action by the plaintiff to recover damages against the defendant for personal injuries sustained through the alleged negligence of defendant's servant. The defence was a denial of liability.

Mr. W. M. Thompson and Mr. Bowen Davis appeared for the plaintiff, and Mr. Montague Shearman, K.C., and Mr. Rowlett for the defendant.

Mr. Thompson, in opening the case, said that the plaintiff was a scaffolder, and he sued the defendant, Mr. T. L. Green, a builder and contractor, for damages for personal injuries alleged to have been sustained through the negligence of the defendant's servant. The defendant was engaged in building a board school in Boundary-lane. At the time of the accident the building had been taken up to the third story. A great deal of ironwork was used, according to the modern American system, and girders placed in various places where the floors would be. Concrete floors were used in order to make the building fire-proof. Then there was what was called centering—that was to say boards were placed under the places where the concrete floor was laid. These were to sustain the concrete while it was hardening and getting set. The allegation in this case was that, at the time of the accident which occurred, the concrete was green, was made of improper materials, and was not sufficiently hardened to carry the necessary weight such as a safe and sound concrete floor ought to do. The plaintiff was in the employ of the defendant, the builder, and, on the day of the accident, his services were borrowed by the foreman of Mr. Pearson, the well-known manufacturer of lighting and heating apparatus, to help to hoist radiators

Mr. Pearson was putting in the various floors. These radiators weighed from 5 cwt. to 6 cwt. The plaintiff went to the top floor with another man, named Ward, for the purpose of guiding the radiators down to the concrete, and, while the radiators were being lowered on a piece of concrete, the concrete gave way, and both fell, Ward being killed and the plaintiff sustaining a fractured skull and other injuries. The plaintiff's case was that the defendant, through his foreman, had no right to invite him to go about this particular work with the radiators. Another complaint was that there ought to have been crute put up to prevent the concrete expanding and weakening.

Chas. Coker, the plaintiff, examined, said on January 27 last year, the day of the accident, he was working for the defendant. In the evening he did some work for Mr. Pearson. Ward, Mr. Pearson's foreman, engaged him to help to hoist the radiators to the third floor. The crutch, gear, and tackle belonged to the defendant. He had that day assisted to hoist some landing stones on to the third floor. After he had unhooked the tackle the floor gave way, and Ward fell through, and these were the injuries sustained by the plaintiff. His wages at the time from the defendant were 3s. 3d. a week. He afterwards went back into the service of the defendant as a watchman at 11s. a week.

Cross-examined.
At the time of the accident he had been working on the school house for sixteen months. He did not know that all the centering had been removed from the floor the day before the accident. Witness had been promised by Mr. Pearson's foreman 3s. for helping to raise the radiators.

F. J. Anderson, examined, said that on January 27 last year, he was in the employment of the defendant as a general labourer, and was engaged on the building in question. He had had something to do with the laying of the third floor. His duty was to measure the concrete and lay it down. The proportions he gauged in that way were three barrels of cement breeze, two of broken brick, one of sand, and a bag of cement. The bag of cement weighed about 2 cwt. He knew the piece of floor that fell—it was about the last section which was put in.

Cross-examined.
It was not rotten stuff that was laid down. It was about a month for concrete to thoroughly harden.

Mr. G. Reed, a hot-water engineer in the service of Mr. Pearson, examined, said he visited the building the day following the accident, and selected a piece of the concrete for analysis. A day or two afterwards he went again to the board school and noticed that the floor in question had split right across.

Cross-examined.
He did not know the name of the gentleman who wanted the concrete.

Mr. Ernest William Crickmay, an architect and surveyor, practising in Mincing-lane, E.C., examined, said that, acting on instructions he visited the building on the morning of February 3 last year. He was shown a section of the floor that fell. He had sampled a piece of the concrete that had fallen; it would have been good concrete if made according to the specification. On examination, he found the concrete was made of breeze, not coke breeze. The finer the stuff used in the making of concrete the longer it took to set. With concrete such as that the centering ought not to have been moved in less than fourteen days. The piece of concrete handed to him by the foreman was very wet, and was green concrete. The floor would have become a good floor in time. There was nothing to complain of in the floor itself.

Cross-examined.
His objection to the concrete was that the breeze was too fine, and finer than that in the specification. In the piece of concrete he had examined there was no brick or clean broken coke. It was an improper thing to do to put any weight on concrete until it was properly hardened.

Mr. Warwick Husband, an architect and surveyor, practising at No. 35, Old Queen-street, Westminster, examined, said he had heard the evidence of the last witness, and, in substance and in detail, agreed with it. Other evidence having been given, the plaintiff's case closed.

Mr. Rowlett then submitted that there was no evidence of negligence to go to the jury, because it was admitted by the plaintiff's witnesses that the concrete would ultimately have been good concrete. The whole question, therefore, was whether the defendant was responsible for the plaintiff having gone on the concrete while it was green. He contended that there was no duty cast on the defendant's foreman to warn Mr. Pearson's men against going on the concrete.

Mr. Thompson argued that there was a case to go to the jury. The defendant's foreman was the only person who could have a full and adequate knowledge of the condition of the floor in question.

His lordship ruled that there was some evidence to go to the jury on that point, but on no other. The whole case as to improper material was therefore gone.

Mr. Shearman then addressed the jury on behalf of the defendant. He submitted that the accident was not due to any negligence on the part of the defendant or his foreman, but that the plaintiff contributed to the accident by his own negligence.

Mr. Gilson, defendant's foreman, examined, said the centering was struck the day before the accident. The concrete was then perfectly safe for anyone to walk upon, but it was not sufficiently strong to bear any great weight. Plaintiff knew perfectly well that nothing should have been put on the concrete at all.

Cross-examined.
When the stones were hoisted up on the afternoon of the accident, he had the floor creaked up with boards.

George Dutton, a scaffolder, also in the employ of the defendant, gave evidence generally corroborating that of the last witness.

In the result the jury returned a verdict for the defendant, and judgment was entered accordingly.

ACTION BY ARCHITECT FOR FEES.

In the King's Bench Division, on the 9th inst., the hearing was concluded, before Mr. Justice Jelf and a common jury, of the case of *Hodges v. Bernstein*—an action by the plaintiff, Mr. R. F. Hodges, an architect and surveyor, against the defendant, Mr. Alexander Bernstein, a boot and shoe manufacturer, to recover 578s. 2s. 1d. for monies expended and fees for professional services rendered to the defendant. The defendant denied liability.

Mr. Spencer-Bower, K.C., and Mr. Warren appeared for the plaintiff, and Mr. Montague Shearman, K.C., and Mr. Cannell for the defendant.

Mr. Spencer-Bower, in opening the case, said that the plaintiff was an architect and surveyor, and an Associate of the Royal Institute of British Architects, practising in John-street, Bedford-row, W.C., and he claimed to be particularly skilled in the designing of theatres. Before practising on his own account the plaintiff was for many years one of the advising officers of the London County Council in respect of theatres and music-halls, and he also acted in a similar capacity before that to the Metropolitan Board of Works. The defendant was a boot and shoe manufacturer in a large way of business, having an office in Moor-lane, and residing at Harlesden. Defendant owned land at Ilford and Edmonton on which he wished to have theatres built. The main part of the present claim was for architect's fees in designing and executing plans, and for work done in connexion with the defendant's proposed theatre at Ilford. In respect of that the plaintiff claimed the sum of 553s. 10s. 3d. For like services in respect of the erection of a theatre on the defendant's land at Edmonton the plaintiff's original claim was for 32s. 19s. 3d., but this was now reduced to 24s. 11s. 10d. These two sums together made a total of 578s. 2s. 1d. Of the larger claim of 553s. 10s. 3d., 494s. 2s. 7d. was for architect's commission of 3 per cent. on the lowest estimate of 16,471l. sent in by Messrs. Waring & Gillow for the erection of the Ilford theatre. This charge was according to the professional scale settled by the Royal Institute of British Architects as being fair to charge the client. In the event of the works proceeding to completion, 5 per cent. was the recognised fee, but where they only proceeded as far as the preparation of plans, 2½ per cent. was the proper charge, with another ½ per cent. added if the architect procured tenders. That was how the 3 per cent. was charged on the lowest estimate received. The other items in that account were charged for interviews with the local authorities, and so forth. As regarded the Ilford claim, the defence was this:—There was no allegation that the fees charged were not fair and reasonable, but, of course, that did not remove from the plaintiff the onus of proving that they were fair and reasonable. There was also no allegation that the work was done unsuccessfully or negligently. Negatively, what the defendant did say was that the work was not done for or at his request. Then, affirmatively, the defendant said that, if the work was done, it was done upon the instructions of one Culbertson Simkin. The plaintiff would prove that the work was done at the request of the defendant, and he would also prove the reasonableness of the charges made. On the Edmonton part of the claim the defence

was totally different. There, the defendant admitted that he did instruct the plaintiff, but as to the claim for monies expended for the proposed theatre, and in respect of this work, the defendant said he had paid the plaintiff 40 guineas, and that, as the work never went forward, he was under no further liability to the plaintiff for this work under the agreement contained in the letters. The answer of the plaintiff to that was that defendant instructed him long before June, 1903, to make surveys of the plot, and that he did so. The charge for that was only about 2l. or 3l. Then defendant started a scheme for building a two-tier house, and there was 5l. odd due for plans in that connexion. Then defendant started another scheme, still for a two-tier house, but there was an alteration of the frontage and an alteration of the stage. In respect of that scheme there were fees due of about 15s. These items made up the 24l. odd he (counsel) had mentioned before. The 40 guineas which defendant had paid was for work done in respect of a third scheme which defendant had for a three-tier house. The defendant had never paid the plaintiff for the work done in connexion with No. 1 and No. 2 schemes.

The learned counsel then read a great mass of correspondence which had passed between the parties, during the course of which his lordship remarked that the real point seemed to be which of these two gentlemen—Simkin or the defendant—employed the plaintiff.

Mr. Shearman admitted, assuming that the plaintiff was entitled to recover from somebody, that he was entitled to the R.I.B.A. scale for the work done at Ilford.

Mr. Spencer-Bower said the question for the jury was whether the work was done for the defendant on his instructions or not.

The plaintiff, having given evidence substantially bearing out counsel's statement, in cross-examination by Mr. Shearman, said he was employed by the defendant all the way through the transactions in question. He did send to the Surveyor of the Ilford District Council the plans of the proposed theatre at Ilford enclosed in a letter in which he said he was sending them on behalf of his client, Mr. Simkin, as representing the Theatre Syndicate. For reasons of his own, the defendant did not wish his name to appear on the drawings, and for the purpose of presenting the drawings Mr. Simkin's name was to be put upon them. The Edmonton Theatre plans were prepared for the defendant on his instructions. The defendant was the freeholder of the land at Ilford upon which it was proposed to erect the theatre, and witness was aware that Simkin had entered into a building agreement to build the theatre for 10,000.

Other evidence having been given, and at the close of the plaintiff's case.

Mr. Shearman, in opening the defendant's case, said it was one which involved a mass of documents. He contended that the whole history of the case was to be found in the letters which had passed between the parties, and these letters showed, not once, but fifty times, that the story the plaintiff told of having been retained by the defendant was inconsistent with the facts. The plaintiff knew that the defendant was selling his land to a company for the purpose of the company erecting the theatre. Defendant had not retained the plaintiff to do the work in question, and he contended that the action could not possibly be maintained.

Mr. Alexander Bernstein, the defendant, gave evidence as to purchasing the land at Ilford in May, 1902, and the land at Edmonton in the following September. He had suggested building some shops on the land at Ilford, but a Mr. Ford had suggested that he should build a theatre upon it. He instructed Mr. Ford to prepare some plans, and this Mr. Ford did for an agreed fee of 10l. 10s. Witness always gave his orders in writing. Mr. Ford introduced him to a Mr. Danvers, and the latter introduced him to Simkin. Simkin afterwards brought the plaintiff to him. He had not at any time instructed or retained the plaintiff as his architect.

At the conclusion of the arguments of counsel and the addresses of counsel, his lordship in summing-up told the jury that before the plaintiff could possibly recover a verdict he must satisfy them that all along, during the whole of these transactions, there was a substantial bargain between him and the defendant that he should do the work in question for the defendant, and that the defendant should pay him for it.

The jury, after fifteen minutes' deliberation, returned a verdict for the defendant.

His Lordship said he quite agreed with the verdict, and thought that any other would have been a gross miscarriage of justice.

Judgment was accordingly entered for the defendant on all issues with costs.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

3,002 of 1904.—O. NEUMEISTER and W. NEUMEISTER: *Metal Plates for Lining Roofs.*

This invention has reference to a roofing plate, by means of which it is possible to provide a lining for the roofing employed in separating walls, chimneys, and the like. The improvement consists essentially of a metal plate, which is provided at one of its longer edges with an angularly projecting outward extension, while to its upper part a rib is secured for the purpose of engagement with the ordinary roofing plates, on the bottom of each of which there is the usual rib, which enters the groove of the rib.

2,797 of 1904.—A. B. RECK: *Hot-water Heating Apparatus.*

A hot-water heating system, wherein steam is introduced into the rising water pipe, consisting of a tank connected directly with the return pipe, and also by means of pipes with the steam space of the separator and with the rising water pipe at a point immediately below the delivery end of the steam pipe.

4,262 of 1904.—J. FOSTER: *Gates and Gate Fittings in Shop and other Doorways.*

A gate for guarding shop and other doorways, entrances, and passages, which consists in having the posts pivotally fitted in a box or trough sunk or let into the ground, the said gate posts being adapted to be operated at will, the arrangement being such that the posts can be turned down to lie horizontally within the box and to be turned up to stand approximately vertical, the gate being either collapsible and adapted to be lowered with the posts into the box and raised with them out of the box or collapsible and detachable from the posts or non-collapsible and detachable.

5,250 of 1904.—F. SMITH: *Springs and Pivots for Doors.*

This invention relates to that class of door springs which contain floor spring checks, and the objects of the invention are to enable one to make the floor spring-box, which contains the mechanism, of a narrower and shallower pattern than hitherto employed, and to make the action so that the door can fold flat back in the same plane as when the door is closed, and by a slight change the action can be altered so as to allow the door to open to the right or left hand. To attain these results the spring is worked by an upright spindle and cam action in the usual way, but the spring slide is connected with the check action by means of collapsible tongs or links working on a fixed centre, and by this arrangement the action is reversed, the check acting as the door closes.

6,106 of 1904.—W. F. SPRATT and R. CURSON: *Form and Arrangement of Legs or Supports to Chairs and the like.*

To so alter the present legs or supports of chairs and the like by substituting for those at the front, back or side of any or all combinations of same, metallic or other supports bolted or fixed to the bottom, side, front, or back, formed or shaped in such a manner that a space is created between each two chairs, when placed side by side in rows, that can be utilised for hats, garments, umbrellas, and the like.

6,379 of 1904.—W. MILLER: *Cooking Ranges.*

According to this invention an oven is formed in front of the back coverings of the range, and to extend beyond the back covers and occupying the space usually allocated to the boiler flue and over the usual open fire flue or directly over the hob, and such oven is heated by carrying the flue from the hot water boiler, at the back of the fireplace, up each side of the oven, such vertical flues being preferably zig-zagged or baffled to direct the heat forward and rearward, or approximately diagonally across the two compartments into which the oven is preferably divided.

8,131 of 1904.—T. FENNEL: *Window Frames.*

A compound window frame, comprising an exterior frame which is secured to the building, an interior frame fitting within the exterior frame and adapted to turn upwards about hinges secured to one of the sides of the exterior frame or to be entirely removable from the exterior frame, the weight of said sliding sashes being counterbalanced by means of spring balances which are secured to the interior frame.

8,190 of 1904.—H. H. HODKIN: *Combined Kitchen Ranges, with Wash Boiler, Bath, and other Attachments.*

This consists in the combination with a kitchen range, having a bottom grate capable of

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made

lateral movement by means of a rack and pinion, or equivalent means, and of an open top boiler having means of access through a hinged door at the side of the jamb; of a sink having a supply cistern and a bath which turns upon its outlet fitting.

8,191 of 1904.—E. BIRCH: *Slopsinks.*

A slopsink, consisting of a tank divided into two chambers by a perforated partition, one of the said chambers serving to receive the liquid containing fatty matter, and the other to receive and drain off the liquid freed therefrom.

9,699 of 1904.—R. J. LINES and A. J. LINES: *Machine for Cutting Wood or other like Material to an Angle, Bevel, Mitre Square, or other Desired Shape.*

A machine for cutting wood or other like material, consisting of a main frame provided with a front horizontal table, vertically arranged, and rotatable discs mounted in the ends of the main frame, and connected by a horizontal support arranged rearwardly of the table, a rack bar connected with said support and movable longitudinally thereof, and provided with depending cutter blades, and means for operating said rack bar.

14,103 of 1904.—G. TIPPEL: *Door Closers.*

A door closer, consisting of the combination of a roller, housing for the same, means for fixing said housing on the door, a race having a helically rising working surface, and arrestment places on the same, and means for adjusting the height of said race.

14,183 of 1904.—G. CONTI-VACCCHI: *Process of and Means for the Impregnation of Wood with Antiseptic and like Substances or Liquids.*

The process which is the object of this invention is entirely based upon the principle of capillary action and atmospheric pressure. By the submersion under atmospheric pressure in a liquid at a higher temperature than 100 deg. C. (bath of vapourisation or dehydration), nearly all the water filling up the pores of the wood is extracted. This escapes in the form of steam, producing an ebullition of the bath liquid, and by the successive submersion at atmospheric pressure in a liquid at a temperature below 100 deg. C. (bath absorption or impregnation), the wood is impregnated with this liquid. The water vapours occupying the pores of the wood on receding are condensed, and leave a space which the liquid goes to fill up by the action of the atmospheric pressure, aided by the absorbent and capillary action of the wood.

20,981 of 1904.—C. WOLFE: *Swing Windows.*

A fastening for swing windows, comprising a fastening lever on the swing frame under spring influence, operated by means of a cord, a releasing device, pivotally jointed to the lever, and a catch adapted to fasten the window in the closed position, and to be released by the releasing device, which comprises a U-shaped lever turning freely with its parallel arms on a pivot of the fastening lever, whilst the catch which is forced automatically into the fastening position has a recess extending to a crosspiece on the releasing device, and in which this crosspiece engages in or to effect the removal or raising of the catch to release the window.

12,708 of 1904.—F. HARRISON: *Fireproof Floorings, Ceilings, and Roofs.*

The construction of fireproof floors, ceilings, and roofs, provided with iron joists or equivalent, consisting in the use of main and auxiliary blocks, the said main blocks spanning the space between the joist, and rabbeted on the meeting sides so that one block forms a part support to an adjacent block.

8,504 of 1904.—W. GLOSSOR: *Manufacture of Artificial Stone.*

A sanitary or hygienic artificial stone for paving and general constructive purposes, and having permanent disinfectant or antiseptic properties by reason of the incorporation with its ingredient materials, at any convenient stage of its manufacture, of a suitable disinfectant or antiseptic substance.

9,502 of 1904.—C. W. GREGORY, JUN.: *Compressible Packing for Wood Block Road Paving.*

A compressible packing for wood block paving, comprising one or more layers of tarred and corrugated paper enclosed in a tarred cardboard case wrapped in canvas, and stitched or sewn together, and finally dipped in tar.

14,527 of 1904.—J. E. SCHNEITZER: *Plates or Slabs for Partitions for Buildings.*

This invention relates to plates or slabs for partitions for buildings. These partitions for dividing rooms or spaces in buildings are manufactured from pumice stone 50 parts, cement 15 parts, volcanic sand 15 parts, hydraulic lime water 20 parts,

7,932 of 1904. W. STEPPER: *Centring or Scaffold for Use in the Construction of Concrete Floors.*

Centring or scaffold for use in the construction of concrete floors, characterised by a revolving catch fitted to each hook of the iron support, which automatically causes wedge-like pressure, and by turning the catch, which is provided with a notch, upwards occasions a lowering of the iron support into the slot of the hook.

27,527 of 1904.—F. R. HEISE: *Lining for Shafts or Wells.*

This consists in providing segments or rings for lining shafts with inward corrugations or the like to strengthen them against lateral pressure, and without horizontal strengthening ribs by means of a greater thickness being employed with increased resisting capacity.

SOME RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

February 25.—By T. W. OFFIN (at Hockley). Hockley, Essex.—"Barton's Farm," 231 a. 0 p.

1 p. 4, p. 2, 100 yds. 2,000

February 27.—By JOHN BOTT & SONS. Horse Hill.—15, 64 yds. 47, u. 70 yds. 3 p. 475

By C. RAWLEY CROSS & CO. Ealing.—11, Leopold-rd., u. 91 yds., g. 1,400

Chiswick.—151, 83, and 165, Devonshire-rd., t., y. 452 10s. 855

Action.—28 to 31, Holland-rd., u. 60 yds., g. 134, a. and y. 105 4s. 810

By ELLIOTT, SON, & BOWEN. Hyde Park.—Hyde Park-st., Lgr. 824, u. 293 yds., g. 111. 1,316

Southwick-cres., Lgr. 401, u. 30 yds., g. 41 10s. 575

By JENKINS & SONS. Lewisham.—218, Lewisham High-rd., u. 53 yds., g. 184, p. 1,550

1, Tressilian-rd., u. 53 yds., g. 184, p. 1,550

New Cross.—11, Amersham-vale, t., y. 247. 400

Deptford.—88 and 91, Brookmill-rd., u. 61 yds., g. 74, w. 671 12s. 605

Brookmill-rd., 87, 89, 41, and 48, Harvel-rd., u. 67 yds., g. 161 8s., y. 164. 1,000

131 and 133, Malpas-rd., u. 68 yds., g. 81 10s., y. 551. 600

New Cross.—95, 98, 100, 109, Sharnbrook-rd., u. 69 yds., g. 121 10s., y. 92. 975

Rotherhithe.—77 and 79, Verney-rd., u. 72 yds., g. 107, w. 674 4s. 410

By FRED VANCE. Finsbury Park.—492, Seven Sisters-rd., u. 62 yds., g. 107 10s., e. 751. 900

By VENTON, BULL, & COOPER. City of London.—8, Laurence Pountney-hill, u. 500 yds., g. 107 10s., e. 751. 465

City of London.—54 to 62, New Broad-st., area 14,000 ft., building lease for 99 yds., let at per annum. 4,000

February 25.—By PEARCE H. CLARKE. South Lambeth.—Wandsworth-rd., etc., f. g. rents 738s., reversion in 80 yds. (in lot). 10,845

By FRANK, PITT, & DUBBERIDGE. Highgate.—Archway-rd., f. g. rents 212s. 8s., reversion in 75 yds. 6,700

By FRANK, GARLAND, & CO. Hornsey.—36, Priory-av., u. 95 yds., g. 84, e. 407. 880

15, Mulken-rd., u. 41 yds., g. 84, e. 407. 385

231, 188, u. 41 yds., g. 84, e. 407. 385

By ALFRED PREECE & SON. Bayswater.—53, Archer-st., u. 39 yds., g. 71 7s., e. 591. 425

Stoke Newington.—3, North-rd., u. 68 yds., g. 61 6s., y. 354. 300

By T. B. WESTACOTT. Kentish Town.—110, Allcroft-rd., u. 69 yds., g. 71 7s., y. 354. 350

47, Hartland-rd., u. 34 yds., g. 61 6s., y. 347. 180

59, Willes-rd., u. 161 yds., g. 61 6s., y. 347. 840

Holloway.—45, Medina-rd., u. 56 yds., g. 61 6s., y. 347. 800

Stoke Newington.—6, Brighton-rd., u. 66 yds., g. 61 6s., y. 347. 800

By C. P. WHITFIELD. Leyton.—Shelley-rd., a plot of freehold building land. 765

By F. WARMAN. Highbury.—95, Highbury New-pk., u. 44 yds., g. 61 6s., y. 347. 600

33 and 35, Highbury-pk., f. g. 1104. 1,470

188, Highbury-hill, u. 72 yds., g. 61 6s., y. 284. 380

Hoxton.—159, New North-rd., u. 51 yds., g. 61 6s., y. 421. 225

8, South-st., u. 22 yds., g. 61 6s., y. 421. 225

By ALFRED RICHARDS (at Tottenham). Tottenham.—3 to 9, Compton-rd., u. 94 yds., g. 407 5s., y. 1632 10s. 700

129 and 131, Compton-rd., u. 94 yds., g. 407 5s., y. 1632 10s. 180

65, 67, 69, and 71, Vernon-rd., u. 94 yds., g. 211, y. 831 8s. 220

Edmonton.—12, 14, 16, and 18, Clifton-cres., u. 92 yds., g. 221, y. 831 12s. 200

1, 2, and 3, Linton Broadway (S), u. 92 yds., g. 241, y. 811 18s. 180

March 1.—By HOBSON, RICHARDS, & CO. Worpleston, Surrey.—Fitch-rd., freehold cottage and plot of land, y. 151. 420

By MARK LIEBL & SON. Mile End.—25, Morgan-st., u. 344 yds., g. 41, y. 681. 840

8, u. 102 yds., g. 61 6s., y. 681. 785

St. Peter's—100, Drummond-st., u.t. 14 yrs., g.r. 40, f.r. 72, 18s.	£200
By Douglas Young & Co.	
South Lambeth—3, St. Barnabas-villas, u.t.	600
37 yrs. g.r. 41, f.r. 52, 10s.	
Canterbury—24, Do. Cranage-st., u.t. 40 yrs., g.r. 40, f.r. 52, 10s.	500
By DEANES & TOWNSON, & Co., in conjunc-	
tion with MATTHEWS, MATTHEWS, & GOOD-	
MAN at Waverley House.	
Waverley—Angels-road, etc., f.g. rents 644. 6s.,	2,430
reversion in 15, 19 to 26 yrs.	
Cranage-st., f.g. rents 711. 4s., reversion in	4,400
19 to 26 yrs.	
Standy-hill, f.g. rents 381. 2s., reversion in 8	2,800
and 24 yrs.	
Warpole Arms, p.h., f.g.r.	3,000
46, reversion in 23 yrs.	
St. 51 and 56, Brook Hill-road, f. w.r.	570
18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000	

Builders' Foremen and Clerks of Works' Institution.—Ordinary Meeting of the Members. 8 p.m.	
Society of Arts.—Mr. E. H. Hankin, M.A., on "Methods of Design in Mohammedan Art." 8 p.m.	
Institute of Sanitary Engineers, Ltd.—Examination of the Literary Committee at 3.30 o'clock; Finance Committee at 5 o'clock; Sessional Meeting in the Members' Room at 7 o'clock, when a discussion will be opened on the "Housing of the Working Classes," by Mr. T. S. Simmons.	
Institution of Civil Engineers.—Students' visit to the Sewage Works at Sutton, Surrey. 2.30 p.m.	
THURSDAY, MARCH 17.	
Royal Institution.—Professor H. H. Turner, D.Sc., on "Recent Astronomical Progress." III. 6 p.m.	
Society of Antiquaries.—8.30 p.m.	
Carpenters' Hall, London Wall (Lectures on Matters Connected with Building).—Mr. H. Phillips Fletcher on "The St. Louis Exhibition, 1904." 8 p.m.	
Institution of Mechanical Engineers.—Paper to be read and discussed: "First Report to the Steam-Engine Research Committee," by Professor David S. Capper. 8 p.m.	
SATURDAY, MARCH 18.	
Royal Institution.—Professor J. J. Thomson, LL.D., D.Sc., on "Electrical Properties of Radioactive Substances." II. 3 p.m.	
Incorporated Association of Municipal and County Engineers.—Yorkshire District Meeting at Cleckheaton.	

PRICES CURRENT OF MATERIALS.

* Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—fact which should be remembered by those who make use of this information.

BRICKS, &c.	
Hard Stocks.....	1 12 0 per 1000 alongside, in river.
Rough Stocks.....	1 8 0 " " " "
Grizzlies.....	2 0 0 " " " "
Facing Stocks.....	2 5 0 " " " "
Shippers.....	1 8 0 " " " "
Flettons.....	1 14 0 " " " "
Red Wire Cuts.....	1 12 0 " " " "
Best Fletton Bed.....	1 12 0 " " " "
Best Red Pressed.....	5 0 0 " " " "
Best Blue Pressed.....	4 4 0 " " " "
Staffordshire.....	4 10 0 " " " "
Do. Bullnose.....	4 10 0 " " " "
Best Stourbridge.....	4 8 0 " " " "
Fire Bricks.....	4 8 0 " " " "
GLAZED BRICKS.	
Best White and Ivory Glazed.....	12 0 0 " " " "
Stretchers.....	11 0 0 " " " "
Headers.....	11 0 0 " " " "
Quoins, Bullnose, and Flats.....	16 0 0 " " " "
Double Stretchers.....	18 0 0 " " " "
Double Headers.....	16 0 0 " " " "
One Side and two Ends.....	19 0 0 " " " "
Two Sides and one End.....	20 0 0 " " " "
Splays, Chamfered, Squints.....	20 0 0 " " " "
Best Dipped Salt Glazed Stretchers and Headers.....	12 0 0 " " " "
Quoins, Bullnose, and Flats.....	14 0 0 " " " "
Double Stretchers.....	15 0 0 " " " "
Double Headers.....	14 0 0 " " " "
One Side and two Ends.....	15 0 0 " " " "
Two Sides and one End.....	15 0 0 " " " "
Splays, Chamfered, Squints.....	14 0 0 " " " "
Second Quality White and Dipped Salt Glazed.....	2 0 0 " " " "
Thames and Pit Sand.....	s. d. 7 0 per yard, delivered.
Thames Ballast.....	5 " "
Best Portland Cement.....	27 0 per ton, " "
Best Ground Blue Lias Lime.....	20 " " "
NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.	
Grey Stone Lime.....	12s. 6d. per yard, delivered.
Stourbridge Fireclay in sacks.....	27s. 6d. per ton at rlv. dpt.
STONE.	
BATH STONE—delivered on road wag-	s. d.
gous, Paddington Depot.....	1 6 1/2 per ft. cube.
Do. do. delivered on road wag-	
gons, Nine Elms Depot.....	1 8 1/2 " "
PORTLAND STONE (20 ft. average).—	
Brown Whitbed, delivered on road	
waggons, Paddington depot.....	2 1 " "
Elms depot, or Fimlico Wharf.....	2 1 " "
White Basebed, delivered on road	
waggons, Paddington depot, Nine	
Elms depot, or Fimlico Wharf.....	2 2 1/2 " "
Ancoaster in blocks.....	1 11 per ft. cube, delivered, rlv. dpt.
Beor.....	1 6 " "
Greenashill.....	1 10 " "
Darley Dale in blocks.....	2 " "
Red Coreshill.....	2 5 " "
Cloesburn Red Freestones.....	2 " "
Red Mansfield.....	2 4 " "
YORK STONE—Robin Hood Quality.	
Scalloped random blocks.....	2 10 " "
6 in. sawn two sides	
(random) to sizes	
(under 40 ft. super.).....	2 3 per ft. super. " "
6 in. rubbed two sides	
ditto, ditto.....	2 6 " "
3 in. sawn two sides	
slabs (random sizes).....	0 11 1/2 " "
2 in. to 2 1/2 in. sawn one	
side slabs (random	
sizes).....	0 7 1/2 " "
1 1/2 in. to 2 in. ditto, ditto.....	0 6 " "

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

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All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

MEETINGS.

FRIDAY, MARCH 10.	
Royal Institution.—Professor J. J. Thomson, LL.D., D.Sc., on "The Structure of the Atom." 9 p.m.	
"Law Courts." 7.30 p.m.	
Institution of Civil Engineers (Students' Meeting).—	
(1) "The Purification of Sewage," by Mr. F. G. Helaby;	
(2) "The Purification of Sewage by Hydrolysis and Oxidation," by Mr. F. O. Kirby. 8 p.m.	
SATURDAY, MARCH 11.	
Royal Institution.—Professor J. J. Thomson, LL.D., D.Sc., on "Electrical Properties of Radioactive Substances." I. 3 p.m.	
System of Institution of Engineers.—Visit to the New Ritz Hotel, Piccadilly, to inspect the "Cage Spleen." 3 p.m.	
Joint of Constructional Engineering. 3 p.m.	
Edinburgh Architectural Association.—Visits (1) to Midlothian County Court Buildings; (2) The new Scotsman Office Buildings.	
MONDAY, MARCH 13.	
Surveyors' Institution.—Mr. E. Morten on "Surveyors' Reports and Certificates." 8 p.m.	
Bristol Society of Architects.—Mr. D. M. Nesbit on "Heating and Ventilating." 8 p.m.	
Society of Arts (Center Lecture).—Mr. H. Laws Webb on "Telephony." 8 p.m.	
TUESDAY, MARCH 14.	
Cardiff, South Wales, and Monmouthshire Architects' Society.—Mr. H. F. Webb on "The Architectural Planning of Public Buildings." 8 p.m.	
Institution of Civil Engineers.—Lord Brassey, K.C.B., on "Shipbuilding for the Navy." 8 p.m.	
WEDNESDAY, MARCH 15.	
Architectural Association (Discussion Session).—Mr. A. E. Murray, M.A., on "An Information Bureau on the Products of the Building Trade." 7.30 p.m.	
Edinburgh Architectural Association.—Paper by Mr. W. Beattie Brown, jun., entitled "Notes on Spain," illustrated by lantern slides. 8 p.m.	

STONE (continued).			
HARD YORK.	STONE.	At per standard.	
Scalloped random blocks	5 s. d.		
6 in. sawn two sides	0 per ft. cube. d. r. dep. d.		
landings to sizes			
(under 40 ft. super.)	2 8 per ft. super.		
6 in. rubbed two sides			
ditto	3 0		
3 in. sawn two sides			
(slabs random sizes)	1 2		
2 in. self-faced random			
flags	0 5		

Hopton Wood (Hard Bed) in blocks 2 s. d.			
Best 3 in. by 11 in. and 4 in.	3 s. d.		
6 in. sawn both			
sides landings	2 7 per ft. super.		
6 in. by 11 in. and 4 in.			
3 in. by 11 in.	1 2		

SLATES.			
in. in.	£ s. d.		
20 x 10 best blue Bangor	13 2	per 1000 of 1200 at r. d.	
20 x 12	13 7	"	
20 x 10 first quality	13 0	"	
20 x 12	13 15	"	
16 x 8	7 5	"	
20 x 10 best blue Fort-			
madoc	12 12	"	
16 x 8	6 12	"	
20 x 10 best Eureka un-			
finishing green	15 17	"	
20 x 12	13 7	"	
18 x 10	13 5	"	
16 x 8	10 5	"	
20 x 10 permanent green	11 12	"	
18 x 10	9 12	"	
16 x 8	6 12	"	

TILES.			
Best plain red roofing tiles	£ s. d.		
Hip and Valley tiles	4 0	per 1000 at r. d. dep. d.	
Best Broseley tiles	50	per 1000	
Do. Ornamental tiles	52 6	"	
Hip and Valley tiles	4 0	per doz.	
Best Rubon red, brown, or			
brindled do. (Edwards)	57	per 1000	
Do. Ornamental do.	60	"	
Hip tiles	3 0	per doz.	
Valley tiles	3 0	"	
Best Red or Mottled Stafford-			
shire do. (Peake)	51	per 1000	
Do. Ornamental do.	54	"	
Hip tiles	4 1	per doz.	
Valley tiles	3 8	"	
Best "Rosemary" brand			
plain tiles, and faced	50	per 1000	
Best Ornamental tiles	50	"	
Hip tiles	4 0	per doz.	
Valley tiles	3 8	"	
Best "Hartshill" brand			
plain tiles, and faced	50	per 1000	
Do. pressed	47	"	
Do. Ornamental do.	50	"	
Hip tiles	4 0	per doz.	
Valley tiles	3 6	"	

WOOD.			
At per standard.			
Deals: best 3 in. by 11 in. and 4 in.	£ s. d.		
by 9 in. and 11 in.	13 10	0 15	0
Deals: best 3 by 9.	13 0	0 15	0
Battens: best 2 1/2 in. by 7 in. and			
8 in. and 3 in. by 7 in. and 5 in.	11 0	0 12	0
Battens: best 2 1/2 by 6 and 3 by 6.	0 10	0	less than
			7 in. and 8 in.
Deals: seconds	1 0	0	less than best
Battens: seconds	0 10	0	
2 in. by 4 in. and 2 in. by 6 in.	9 0	0 10	0
2 in. by 4 1/2 in. and 2 in. by 5 in.	8 10	0 9	10
Foreign Sawed Boards:			
1 in. and 1 1/2 in. by 7 in.	0 10	0	more than
			battens.
3 in. by 11 in.	1 0	0	

Fir timber: best middling Danzig or			
Memel (average specification)	£ s. d.		
Seconds	4 0	0 4	10
Small timber (3 in. to 10 in.)	3 0	0 3	10
Small timber (8 in. to 8 in.)	3 0	0 3	10
Swedish balks	2 10	0 3	0
Pitch-pine timber (30 ft. average)	3 5	0 3	15

JOISTED WOOD.			
At per standard.			
White Sea: first yellow deals,			
3 in. by 11 in.	24	0	25
3 in. by 9 in.	22	0	23
Battens, 2 1/2 in. and 3 in. by 7 in.	16	0	18
Second yellow deals, 3 in. by			
11 in.	18	0	20
3 in. by 9 in.	17	0	19
3 in. by 11 in.	13	0	14
Third yellow deals, 3 in. by 11 in.			
and 9 in.	13	0	15
Battens, 2 1/2 in. and 3 in. by 7 in.	11	0	12
Petersburg: first yellow deals,			
3 in. by 11 in.	21	0	22
Do. 3 in. by 9 in.	18	0	19
Battens, 2 1/2 in. and 3 in. by 7 in.	12	0	13
Second yellow deals, 3 in. by 11 in.	14	0	15
Do. 3 in. by 9 in.	14	0	15
Battens, 2 1/2 in. and 3 in. by 7 in.	11	0	12
Third yellow deals, 3 in. by 11 in.	13	0	14
Do. 3 in. by 9 in.	12	0	13
Battens, 2 1/2 in. and 3 in. by 7 in.	10	0	11
White Sea and Petersburg:			
First white deals, 3 in. by 11 in.	14	0	15
Do. 3 in. by 9 in.	13	0	14
Battens, 2 1/2 in. and 3 in. by 7 in.	11	0	12
Second white deals, 3 in. by 11 in.	14	0	15
Do. 3 in. by 9 in.	13	0	14
Battens, 2 1/2 in. and 3 in. by 7 in.	10	0	11
Pitch-pine: deals:			
Under 3 in. thick extra	0 10	0	1
Yellow Pine—First, regular sizes	40	0	upwards.
Oddments	28	0	0
Seconds, regular sizes	30	0	0
Yellow Pine oddments	23	0	0
Kauri Pine—Planks, per ft. cube.	0 3	6	5
Danzig and Stettin Oak Logs—			
Large, per ft. cube	0 3	0	3
Small	0 2	0	2
Wainscot Oak Logs, per ft. cube.	0 5	0	5

WOOD (continued).			
At per standard.			
JOINERS' WOOD (continued).			
Dry Wainscot Oak, per ft. sup. as	£ s. d.		
inch	0 8	0 9	
3 in. do.	0 7		
Dry Mahogany—Honduras, Ta-			
asco, per ft. super. as inch	0 0	9	1
Selected, Figury, per ft. sup. as			
inch	0 1	6	2
Dry Walnut, American, per ft. sup.			
as inch	0 10	0 1	0
Test, per load	17	0	21
American Whitewood Planks,			
per ft. cube	0 4	0 5	0
Prepared Flooring, etc.			
1 in. by 7 in. yellow, planed and			
shot	0 13	6	0 17
1 in. by 7 in. yellow, planed and			
matched	0 14	0	0 18
1 1/2 in. by 7 in. yellow, planed and			
matched	0 16	0	1 0
1 in. by 7 in. white, planed and			
matched	0 12	0	0 14
1 in. by 7 in. white, planed and			
matched	0 12	6	0 15
1 1/2 in. by 7 in. white, planed and			
matched	0 15	0	0 16
3 in. by 7 in. yellow, matched			
and beaded or V-jointed brds.	0 11	0	0 13
1 in. by 7 in. do.	0 10	0	0 12
3 in. by 7 in. white do.	0 10	0	0 11
1 in. by 7 in. do.	0 12	9	0 13
6 in. at 6d. to 9d. per square less than 7 in.			

JOISTS, GIRDERS, &c.			
In London, or delivered			
Roller Steel Joists, ordinary	£ s. d.		
sections	5 15	0	6 15
Compound Girders, ordinary			
sections	7 5	0	8 7
Steel Compound Stanchions	9 2	6	10 12
Angles, Tees and Channels, ordi-			
nary sections	7 7	6	8 7
Pitch Plates	7 15	0	8 5
Cast Iron Columns, Standard			
chairs including ordinary pat-	6 12	6	7 15

METALS.			
Per ton, in London.			
IRON—	£ s. d.		
Common Bars	7 0	0	7 10
Staffordshire Crown Bars, good			
merchant quality	7 10	0	8 0
Staffordshire "Marked Bars"			
Mild Steel Bars	9 10	0	8 0
Mild Steel Bars	8 5	0	8 10
Hoop Iron, basis price	8 15	0	9 0
" do. Galvanized			
"And upwards, according to size and gauge.)			
Sheet Iron, Black—			
Ordinary sizes to 30 g.	9	0	0
" " 24 g.	11	15	0
" " 26 g.	11	15	0
Sheet Iron, Galvanized, flat, ordinary quality—			
Ordinary sizes—6 ft. by 2 ft. to			
3 ft. to 32 g.	12	10	0
Ordinary sizes to 22 g. and 24 g.	13	0	0
" " 26 g.	14	0	0
Ordinary sizes to 20 g.	15	0	0
" " 22 g. and 24 g.	16	0	0
" " 26 g.	17	0	0
Galvanized Corrugated Sheet—			
Ordinary sizes 6 ft. to 8 ft. 20 g.	12	10	0
" " 22 g. and 24 g.	13	0	0
" " 26 g.	13	15	0
Best Soft Steel Sheets, 6 ft. by 2 ft.			
to 3 ft. by 20 g. and thicker	11	0	0
Best Soft Steel Sheets, 22 g. & 24 g.	12	0	0
Cut nails, 3 in. 6 in.	13	10	0
(Under 3 in. usual trade prices.)			

LEAD, &c.			
Per ton, in London.			
LEAD—Sheet, English, 3 lb. and up	£ s. d.		
Pipe in coils	14	15	0
Soil pipe	17	15	0
Compo pipe	17	15	0
ZINC—Sheet—			
Vieille Montagne	30	15	0
Silesian	30	10	0
COPPER—			
Strong Sheet	per lb.	0	10
Thin	0	11	0
Copper nails	0	10	0
BRASS—			
Strong Sheet	0	0	93
Thin	0	0	10
TR—English Ingots	0	1	44
SOLDER—Plumbers'	0	0	62
Fluxes	0	0	8
Blowpipe	0	0	9

ENGLISH SHEET GLASS IN CRATES.			
per ft. delivered.			
15 oz. thirds	34	1	per ft. delivered.
" fourths	34	1	
21 oz. thirds	34	1	
" fourths	34	1	
26 oz. thirds	34	1	
" fourths	34	1	
32 oz. thirds	34	1	
" fourths	34	1	
Fluted Sheet, 18 oz.	34	1	
" 21 oz.	34	1	
Hartley's Rolled Plate	24	1	
" "	24	1	
" "	24	1	
" "	24	1	

OILS, &c.			
£ s. d.			
Raw Linseed Oil in pipes	per gallon	0	1
" " in barrels	0	1	7
" " in drums	0	1	9
Bled	0	1	8
" " in barrels	0	1	8
Turpentine, in drums	0	1	11
" " in drums	0	3	4
Genuine Gromd English White Lead	per ton	19	15
Red Lead, Dry	per ton	15	0
Best Lined Oil Putty	per cwt.	0	6
Stockholm Tar	per barrel	1	12

VARNISHES, &c.			
Per gallon.			
Fine Pale Oak Varnish	2	8	d.
Fine Copal Oak	0	10	6
Superfine Pale Elastic Copal	0	12	6
Fine Extra Hard Church Oak	0	14	0
Superfine Hard-drying Oak, for seats of			
Churches	0	14	0
Fine Elastic Carriage	0	16	0
Superfine Pale Elastic Carriage	0	16	0
Fine Pale Maple	0	16	0
Finest Pale Durable Copal	0	16	0
Extra Pale French Oil	0	16	0
Eggshell Flattening Varnish	0	13	6
White Copal Enamel	1	4	
Extra Pale Paper	0	10	6
Best Japan Gold Size	0	12	0
Best Black Japan	0	18	0
Oak and Mahogany Stain	0	8	0
Brunswick Black	0	16	0
Berlin Black	0	16	0
Knottin	0	19	0
French and Brush Polish	0	10	0

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT to the Office of the Editor, and must reach us not later than 10 a.m. on Thursday (S.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements and notices of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 1000, unless in some exceptional cases and for special reasons.)

* Denotes accepted. † Denotes provisionally accepted.

TENDERS.

Communications for insertion under this heading should be addressed to the Editor, and must reach us not later than 10 a.m. on Thursday (S.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements and notices of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 1000, unless in some exceptional cases and for special reasons.)

* Denotes accepted. † Denotes provisionally accepted.

ABERDEEN.—For additions to schools at Logie Burn and Fetterarn, Mr. R. G. Wilson, architect, 181A, Union-street, Aberdeen.

Logie Burn School.

Mason: J. Smith, Kirkcaldy.

Carpenters: A. & W. Hendry, Warrle.

Slater: G. Mitchell, Inverurie.

Plasterers: J. & R. Selveright, Inverurie.

Plumbers: J. Binkie & Sons, Aberdeen.

Painters: G. Donald & Sons, Aberdeen.

Fetterarn School.

Mason: F. Morrison, Oulter, Aberdeen.

Carpenters: A. & W. Hendry, Warrle.

Slater: G. Mitchell, Inverurie.

Plasterers: J. & R. Selveright, Inverurie.

Plumbers: J. Binkie & Sons, Aberdeen.

Painters: G. Donald & Sons, Aberdeen.

BAGNALL.—For two concrete sites and laundry machinery and plant at the smallpox hospital, for the North Staffordshire Joint Smallpox Hospital Board. Mr. E. Jones, architect, 10, Albion-street, Hanley.

Concrete Sites.

Saunders & Torrance £706 Tompkinson & Co. £265

T. Hanley 501 Bettley 470

C. Cornes & Sons 493 J. Bagnall 470

J. Moss, Milton 498

Roads and Paths, Drains, &c.

Saunders & Torrance £287 Tompkinson & Co

COMPETITIONS AND CONTRACTS.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered
*Plans for Public Elementary School	Swindon Education Committee	5 per cent. commission	April 14
*Proposed Technical Institute	Rochester Corporation	50, 20, and 10 Guineas	May 15

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Four Houses, Toller-lane, Bradford	Cardiff Corporation	J. W. C. Atkinson, Architect, 1, Ivegate, Bradford	Mar. 18
Public Conveniences, Allensbank-road, Cathays	Karslow U.D.C.	W. Harpur, Borough Engineer, Cardiff	do.
Scavenging	do.	J. R. MacMillan, Council Office, Shiremoor	do.
Whinstone, Slag, Team Labour	Edinburgh Corporation	A. Dale, Clerk, 85 and 86, Howard-street, North Shields	do.
Mason, Wright, Plumber, Gasfitter, etc., Work	do.	Company's Office, East-street, Farnham	do.
Repairs of Pavements, Gravel, etc., Work	do.	City Road Surveyor, City-chambers, Edinburgh	do.
Cast and Wrought-Iron and Steel Material, etc.	do.	Resident Electrical Engineer, Dewar-place, Edinburgh	do.
Materials and Stores	do.	Inspector of Cleaning and Lighting, 331, High-street, Edinburgh	do.
Gun Metal, etc., Fire Appliances	East. C'ties. Com., Shropshire C.C.	Freemaster, Lauriston-place, Edinburgh	do.
880 In. yds. Fireclay Pipe Sewers, etc., Bonnybridge	Berkshire C.C.	Warren & Sharr, C.E., 94, Hope-street, Glasgow	do.
Tools	do.	J. F. Hawkins, County Surveyor of Highways, Reading	do.
Carting, etc.	Hale U.D.C.	do.	do.
Annual Contracts	Halifax Highway Committee	T. Blagburn, Surveyor, Ashley-road, Hale	do.
Private Improvement Works, Emu-cote-grove	Hastings Corporation	J. Lord, C.E., Town Hall, Halifax	do.
375,000 Jarrah Wood Paving Blocks	do.	P. H. Palmer, Borough Engineer, Town Hall, Hastings	do.
150,000 Wood Paving Blocks	Milton-next-Sittingbourne U.D.C.	do.	do.
Broken Guernsey Granite	Metropolitan Asylums Board	W. R. Warlow, Town Hall, Milton	do.
*Additions to Stores and Workshops, Fulham	King's Norton, etc., U.D.C.	Office of the Board, Embankment, E.C.	do.
Street Works, Bowdley-road, Selby Oak	Salford Corporation	A. W. Cross, Surveyor, 23, Valentine-road, King's Heath	Mar. 19
Erecting a River Wall, Brazil-street, Broughton	Belfast Works Department	Borough Engineer's Office, Town Hall, Salford	do.
Timber and Ironwork for Verandah	Tynemouth Corporation	Superintendent of Works Office, Townhall-street, Belfast	do.
24 in. Flage	Newcastle-on-Tyne Corporation	J. F. Smith, Borough Surveyor, North Shields	do.
Excavating and Laying Foundations, Percy Main	Swansea Town Council	City Engineer's Office, Town Hall, Newcastle-on-Tyne	do.
Excav., Lay, Foundation, Preston Comty., N. Shields	Secretary of State for India	R. H. Wyrill, Waterworks Engineer, Guildhall, Swansea	do.
Materials, Stores, etc.	Farnham Gas Co.	Director General of Stores, India Office, Whitehall, S.W.	do.
Cast-Iron Pipes, Valves, etc., Cray Reservoir Works	Ipswich Sanitary Authority	Company's Office, East-street, Farnham	do.
Crescented Pine Sleepers	Bingley District Council	E. Buckham, Borough Surveyor, Town Hall, Ipswich	do.
Extension of Gas Mains to Wrecchlesham	Dublin Corporation	R. Armistead, Engineer, S. Charles-street, Bradford	do.
Materials and Jobbing Works	Establey, etc., Hospital Board	Engineer's Office, City Hall, Dublin	Mar. 15
Earthwork Pipe Sewers, Cottingham	Halifax Gas Committee	J. Wilkinson, Engineer, Gasworks, Halifax	do.
Two Electric Motors (Main Drainage Works)	Leeds Corporation	City Engineer's Office, Leeds	do.
Diphtheria Pavilion, Infectious Hosp., Morton Banks	do.	do.	do.
Stores	do.	do.	do.
Ironwork for Bridge over Low Beck, Staincross-place	Rochdale Paving, etc., Committee	Borough Surveyor's Office, Town Hall, Rochdale	do.
Abutments for Bridge over Low Beck	Chepping Wycombe Corporation	T. J. Rushbrooke, Borough Surveyor, 77, Essex-st., High Wycombe	do.
Sixteen Water Closets, Art-street and Grand-street	Rhonda U.D.C.	F. Bergin, Engineer, 38, Westmoreland-street, Dublin	do.
Forming Road, East-end Park (adjoining)	Leeds Tramways Committee	O. Thomas, Gas and Water Offices, Petro, Glam.	do.
Sets, etc.	Manchester Cleansing Committee	J. B. Hamilton, Tramway Offices, City-square, Leeds	do.
3,000 yds. of Sewers and Surface Water Drains	Cranbrook R.D.C.	R. Williamson, Town Hall, Manchester	do.
Sewerage Works, Birr	Bosmere and Clayton Guardians	G. F. Lambert & Son, Architects, Bridgend	Mar. 16
Materials and Stores, Gas and Water Department	Pontefract Indus. Co-operative Soc.	R. M. Cook, Clerk, 6, Providence-street, Ipswich	do.
Stores	Gloucester Electricity Supply Com.	Garside & Pennington, Architects, Pontefract	do.
Timber	Leeds Sewerage Committee	G. S. Lakeway, Guildhall, Gloucester	do.
Road Materials	Inkerman Lodge Building Club	City Engineer, Leeds	do.
Three Iron Staircases, Union Workhouse, Barham	Preston Corporation	W. Beddoe Rea, Architect, 3, Dumfries-place, Cardiff	Mar. 17
Three Shops, Offices, and Workrooms	Rothwell U.D.C.	J. Barron, Engineer, Dock Offices, Preston	do.
Plant for Municipal Electricity Works	Ledbury U.D.C.	J. Southworth, Surveyor, Council Offices, Rothwell	do.
Stores	Hull Corporation	R. G. Gurney, Surveyor, Worcester-road, Ledbury	do.
Twenty-two Cottages at Park Hill, Tredegar	Kilmarnock District Committee	E. A. White, City Engineer, Town Hall, Hull	do.
Stores	Admiralty	J. Sturrock, Jun., Engineer, 65, King-street, Kilmarnock	do.
Road Materials	Bury Gas Committee	Director of Works Department, 21, Northumberland-avenue, W.C.	Mar. 18
Sinking Well, etc., at Massington Pumping Station	Spennymoor U.D.C.	H. Simmonds, Engineer, Gasworks, Bury	do.
7,500 tons of Macadam	Cardiffe Education Committee	C. R. Spencer, Surveyor to Council, Spennymoor	do.
33 miles of Sewers (Mauchline Sewerage)	Rotherham Corporation	H. Waters, Architect, Beaufort	do.
Dundonald Water and Sewerage Works	do.	Chief Constable, Town Hall, Rotherham	do.
New Royal Naval Reserve Buildings, Portree	Balfour Constitutional Club	Electrical Engineer, Rawmarsh-road, Rotherham	do.
Stores	Mr. T. D. Bevan	A. A. Evans, Williams & Evans, Architects, Bridgend	do.
Road Metal	Weardale and Consett Water Co.	Company's Office, Front-street, Chester-le-Street	do.
Double Vertical Steam Fire Engine	Leeds Waterworks Committee	City Engineer's Waterworks Office, Leeds	do.
Motor Balancer for Electric Light Station	Falldington Borough Council	Borough Surveyor, Town Hall, Falldington, W.	do.
Club Premises at Nelson	Locheally Town Council	Buchanan & Bennett, C.E., 12, Hill-street, Edinburgh	Mar. 20
Bungalow at Kitching, Portswarf	Bucklow R.D.C.	J. Burgess, Tablay, Knutsford	do.
Inspector's House and Office, etc., at Chester-le-Street	Long Ashton R.D.C.	J. Hawkins, District Surveyor, Brockley, near Reims	do.
Stores	Birmingham Guardians	A. P. I. Cottrell, Engineer, 25, Baldwin-street, Bristol	do.
*Works and Materials	Knottling U.D.C.	W. H. Ward, Architect, Paradise-street, Birmingham	do.
Roads, Fencing, etc. (Public Park)	Cardiff Education Committee	Garside & Pennington, Architects, Pontefract	do.
Road Materials, etc.	Rothwell U.D.C.	E. C. Marks, Surveyor, 30, Fisher-street, Carlisle	do.
Hauling and Quarrying Stone	do.	E. J. Silcock, Engineer, 10, Park-road, Leeds	do.
Sinking and Lining a Well, 100 ft. deep	Hemsworth R.D.C.	T. H. Richardson, Hemsworth, near Wakefield	do.
Testing Supply of Water	Scholes R.D.C.	A. Greaves, Surveyor, Woodbine Villa, Hesse	do.
Alterations to Female Epileptic Block at Infirmary	Oxford Corporation	City Engineer, Town Hall, Oxford	do.
Additional Sewers	Wellington R.D.C.	W. Jackson, Clerk, Wellington	do.
Craker's Lodge, etc., Park Farm, Pils. Deaton & Co.	Rhymney Iron Co.	At the Offices, Rhymney	do.
Sewage Disposal Works at Stourton	Glamorgan Education Committee	T. M. Franklin, Clerk to County Council, Westgate-street, Cardiff	do.
Pumping and Screening Machinery	Birmingham Watch Committee	J. Price, City Engineer, Council House, Birmingham	do.
Cast-Iron Tank	Pontefract R.D.C.	J. Dickson Smith, Clerk, Union Offices, Pontefract	do.
Stone	Gelligaer and Rhigos R.D.C.	J. P. Jones, Engineer, Ringwood, via Cardiff	do.
Painting Work at Cemeteries	Rev. S. Jackson	Cook & Edwards, Architects, Masonic-buildings, Bridgend	do.
Excavating and Laying Sidings at Pengam	Maldstone U.D.C.	T. F. Hunting, Surveyor, Fair Meadow, Maldstone	do.
Extension of Bridge at Pengam Pile	Kingston Guardians (Surrey)	J. Edgell, Union Offices, Norbiton, Kingston-on-Thames	do.
Additions, etc., Maindy School, Cowbridge			
Fire Station, Bordesley-green			
Materials			
Widening Road at Barges			
Vicarage House and Stabling, Maesteg			
Road Material			
Granite			

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Readers to be Delivered
Annual Contracts	Southgate U.D.C.	C. G. Lawson, Surveyor, Council Offices, Palmer's Green, N.	Mar. 20
Gravel and Concrete Balconies	Darlington Corporation	G. Winter, Corporation, Town Hall, Darlington	do.
Gravel, Slag, and Gravel	Dublin Public Health Committee	Civ. Treasurer's Office, Dublin	do.
2,700 yds. of Cast-iron Pipes	Wells R.D.C.	A. G. Russ, Clerk, Poor Law Office, High-street, Wells	Mar. 21
Seven Villas at Malindi, Poutre	Ely R.D.C.	R. H. Ennals, District Surveyor, Lynn-road, Ely	do.
Loop Line (51 chains) at Landore, near Swansea	Wesleyan Town Council	C. Mawson, Borough Surveyor, Town Hall, Evesham	do.
Office Accommodation at Paddington Station, W.	Maindy Building Club	W. D. Morgan, Architect, Victoria-chambers, Pentre, Glam.	do.
Builders' and Cabinetmakers' Work, Sessions House	Great Western Railway Co.	Office of Engineer, Neath Station	do.
Heating and Ventilating, Crown Court, Sessions House	Standing Joint Committee	Engineer's Office, Paddington Station, W.	do.
1,000 tons of Granite Macadam	do.	County Architect, 86, Week-street, Maidstone	do.
Gravel	Runcorn R.D.C.	G. F. Ashton, 71, High-street, Runcorn	do.
Heating and Tar-paving Playgrounds	Willenden District Council	A. Cooper, Surveyor, The Terrace, Diss	do.
Additional, etc., to Schools	Ilford U.D.C.	Council's Engineer, Dyke-road, Ilford, N.W.	do.
Road Materials	Wood Green U.D.C. Educ. Comm.	C. J. Dawson, Architect, 11, Cranbrook-road, Ilford	do.
Team Labour and Annual Contracts	Hoo R.D.C.	C. J. Gunyon, Architect, Town Hall, Wood Green, N.	do.
Road Materials	Bredbury and Romiley U.D.C.	Surveyor, School Lane, Bredbury	Mar. 22
Requising Cattle Market, Northampton	Mutford and Loughland R.D.C.	S. G. Bloy, Surveyor, Oulton Broad, Lowestoft	do.
New Sewers and Underpinning and Repairs	Northampton Corporation	A. Fidler, Borough Engineer, Guildhall, Northampton	do.
Painting and Plastering at Downs School, Sutton	Holborn Borough Council	Municipal Offices, 167, High Holborn, W.C.	do.
Road Materials	Metropolitan Asylums Board	Office of the Board, Embankment, E.C.	do.
Steel Trough Bridge at Lancashire	Lancaster R.D.C.	W. Cummings, Surveyor's Office, Lancaster, Durham	Mar. 23
Requising Metal Merchandise, Collyer, Runcorn	Manchester Ship Canal	W. H. Hunter, M.Inst.C.E., 41, Spring-gardens, Manchester	do.
Waterworks Plant	Aston Manor Public Works Sub-Com.	W. Johnson, Manager, Postycomyngham, near Bridgend	do.
Requising of Existing Trampers	Peterborough Corporation	G. H. Jack, Borough Surveyor, Council House, Aston Manor	do.
Water in connection with Tramways	Aston Manor Corporation	J. C. Gill, Waterworks Engineer's Office, Peterborough	do.
Haywood Corporation	do.	I. Green, Engineer, 37, Waterloo-street, Birmingham	Mar. 24
Manchester Education Committee	do.	J. A. Settle, Borough Engineer, Heywood	Mar. 25
Clayton-le-Moors U.D.C.	do.	Education Office, Deansgate, Manchester	do.
Gaslow Corporation	do.	Teather & Wilson, Architects, Andrew's-bldgs., Queen-st., Cardiff	do.
Salford Corporation	do.	J. I. Redfern, Boro' Engr., Corporation Office, Gillingham, Kent	do.
Malling R.D.C.	do.	M. H. Harbottle, County Surveyor, Queen-street, Exeter	Mar. 27
Hammersmith Borough Council	do.	J. M. Smyth, Borough Electrical Engineer, Kedgeley	do.
Dorchester Town Council	do.	Education Office, Deansgate, Manchester	do.
Fulham Borough Council	do.	A. Dodgson, Surveyor, Council Offices, Clayton-le-Moors	do.
Manchester Gas Committee	do.	City Engineer, 64, Cochrane-street, Glasgow	Mar. 28
Bolton Electricity Committee	do.	Borough Engineer's Office, Town Hall, Salford	do.
Oldbury U.D.C.	do.	W. S. V. Cullerne, Clerk, Council Offices, Commercial-st., Guildford	do.
Peaseston U.D.C.	do.	J. Marshall, Surveyor, West Malling	do.
Powell Duffryn Wkms's Bldg. Soc.	do.	Town Clerk, Town Hall, Hammersmith	do.
Essex County Lunatic Asylum	do.	Borough Surveyor, Dorchester	Mar. 29
Birmingham Baths Committee	do.	Council's Engineer, Town Hall, Fulham, S.W.	do.
Mr. W. Scott	do.	Borough Surveyor, Town Hall, Fulham, S.W.	do.
Holy Trinity Schools, Guildford	do.	C. Nickson, Gas Department, Town Hall, Manchester	Mar. 30
Radcliffe Room and Power Co.	do.	A. A. Day, Borough Electrical Engineer, Spa-road, Bolton	do.
Radcliffe Room and Power Co.	do.	J. T. Bayrs, M.E., 39, Corporation-street, Birmingham	do.
Radcliffe Room and Power Co.	do.	G. & F. W. Hodson, Engineers, Loughborough	Mar. 31
Radcliffe Room and Power Co.	do.	G. Kenahole, Architect, Station-road, Bargoed	do.
Radcliffe Room and Power Co.	do.	F. Whitmore, Architect, Duke-street, Chelmsford	April 1
Radcliffe Room and Power Co.	do.	J. Cox, Superintendent Engineer, Kent-street, Birmingham	April 8
Radcliffe Room and Power Co.	do.	Oliver & Dodgson, Architects, Carlisle	No date.
Radcliffe Room and Power Co.	do.	J. Athron, Architect, 10, Priory-place, Doncaster	do.
Radcliffe Room and Power Co.	do.	Manager (T. Bower), Sugden-street, Thornton-road, Bradford	do.
Radcliffe Room and Power Co.	do.	W. G. Lower, Architects, 124, High-street, Guildford	do.
Radcliffe Room and Power Co.	do.	W. H. Atkinson, Architect, Shaw-street, Colne	do.
Radcliffe Room and Power Co.	do.	Davidson & Phillips, 148, Aldersgate-street, E.C.	do.
Radcliffe Room and Power Co.	do.	W. G. Tutt, Architect, 18, Ironmonger-lane, Cheapside, E.C.	do.
Radcliffe Room and Power Co.	do.	H. W. Frost, Architect, 10, Berwick-street, E.C.	do.
Radcliffe Room and Power Co.	do.	J. Carter Jonas & Sons, Cambridge	do.

Those marked with an (*) are advertised in this number.

Competitions, iv.

Contracts, iv. vi. viii. x.

Public Appointments, —.

TENDERS.—Continued from page 270.

NOTTINGHAM.—For erecting four residences (two with garages) in Colwick-road and Meadow-lane, Nottingham. Mr. H. Alcock, architect, Nottingham:—
 J. Messon, £1,825 0 0 G. A. Pillatt, £1,661 0 0
 R. E. Vickers, 1,790 10 0 T. Barlow, 1,660 0 0
 W. Vickers & Co., W. & J.
 Son, 1,793 0 0 Simons, 1,655 0 0
 Woods Bros., 1,789 0 0 G. Lovett, 1,650 0 0
 J. O. Thomas, 1,783 0 0 Richardson &
 & Barry, 1,774 0 0 T. Steadwell, 1,629 10 0
 J. Whitaker, 1,750 0 0 T. Fish, &
 J. Wright, 1,728 10 3 Son*, 1,615 0 0
 J. A. Carter, 1,720 0 0 W. Crane, Ltd., 1,568 0 0
 J. Booth, 1,714 14 10 J. Wright, 1,568 0 0
 H. G. Scott, 1,697 0 0

OSSETT.—For laying 1,000 lineal yds. of 12-in. asbestos pipe sewer (Roundwood outfall), for the Corporation. Mr. W. Hirst, Borough Surveyor, 1, New-street, Ossett:—

A. Williams & Co., £1,020 2 0
 A. Graham & Son, Ltd., 2,440 0 0
 Garforth Bros., 619 19 0
 M. Arundale, 609 1 0
 T. Williams, 601 6 5
 D. Williams, 600 0 0
 S. Coop & Son, 600 0 0
 W. Doleman, 599 2 0
 Wilson Bros., 581 8 6
 A. O. O'Neil, 493 8 4
 T. Wade, 493 8 8
 H. Arnold & Son, Leeds*, 469 0 0

PORTFOLIO.—For laying 13,200 square yds. of paving a variety of playgrounds, for the Education Committee of the Urban District Council. Mr. P. R. A. Humphreys, Engineer and Surveyor to the Council:—
 100 yds. of England Asphalt Co., Manchester £1,387 9 10

PENARTH.—For street improvement works in Windsor-place, Archer-place, etc., for the Urban District Council. Mr. E. I. Evans, Surveyor, Council Offices, Penarth:—

	Archer-terrace-lane.	Archer-place.	Windsor-place.
F. Ashley	£ s. d. 82 0 6	200 2 9	204 1 3
Mackay & Davies	81 12 9	190 2 9	180 9 1
W. Jenkins	81 4 0	193 0 0	180 3 0
A. C. Collins & Co.	80 12 9	187 19 9	187 12 0
W. Burton	80 3 4	179 7 5	183 12 0
J. Rich*	70 7 8	162 9 5	178 19 7

RAGLAN.—For alterations and additions to National School, for the managers. Mr. W. H. D. Caple, architect, Church-street-chambers, Cardiff:—
 J. Edwards & G. Jones £310 0 0
 Son £393 0 0 R. Jones, &
 Gwatkin Bros., 378 17 11 Raglan*, 310 0 0
 H. Woolley & Son 361 5 0
 Subject to revision with the architect.

REDHILL.—For rebuilding Station Hotel, South Nutfield, for Messrs. Mellor & Neale, Ltd. Mr. E. Penfold, architect, High-street, Reigate:—
 C. Parsons £1,850 J. J. Waycott £1,503
 T. Bashford 1,649 J. J. Pink 1,491
 W. F. Wilkinson 1,580 G. Martin 1,490
 A. King & Son 1,518 G. Elsey & Sons 1,400

REIGATE.—For the erection of business premises, West-street, Reigate, for Messrs. W. Chadwood & Sons. Mr. E. Penfold, architect, High-street, Reigate:—
 R. Lee & Son £2,700 J. J. Waycott £2,214
 J. Waycott 2,695 S. Jeal 2,130
 G. Cummins & Sons 2,450 T. Nightingale 2,129
 G. Elsey & Sons 2,217

REIGATE.—For additions to Reigate Grammar School, for the Governors. Mr. E. Penfold, architect, High-street, Reigate:—

A. B. Wiles	£7,561 0 0	G. Cummins & Son	£7,239 0 0
T. Bushby & Son	7,559 0 0	J. Hodge & Son	7,163 0 0
J. King & Son	7,634 0 0	J. J. Pink	6,983 17 2
Buckland & Waters	7,480 0 0	S. Jeal	6,637 0 0
J. Longley & Co.	7,398 0 0		

REIGATE.—For erection of Children's Homes, Mead-ville, Redhill, for the Guardians, Reigate Union. Mr. E. Penfold, architect, High-street, Reigate. Quantities by Messrs. John Leaning & Sons:—

A. B. Apted	£3,444 0 0	W. Wickman	£2,923 16
G. Cummins & Son	3,242 0 0	T. Nightingale	2,973 0 0
J. Waycott	3,163 12	S. Jeal	2,945 0 0
C. Parsons	3,010 0 0	G. Martin	2,784 0 0
J. Childs	3,000 0 0	J. Hodge & Son	2,632 0 0
		G. Elsey & Sons	2,645 0 0

REIGATE.—For entrance lodge, vagrant wards, receiving wards, workshops, mortuary, and alterations to existing buildings at the Workhouse, for the Guardians, Reigate Union. Mr. E. Penfold, architect, High-street, Reigate. Quantities by Messrs. John Leaning & Sons:—

R. Dean & Co.	£17,580	Holliday & Green	£14,919
H. Lovatt, Ltd.	16,937	J. Longley & Co.	14,919
Cropley Bros.	16,483	Walter Wallis	14,727
J. Smith & Sons	16,420	Goddard & Sons	14,418
T. Bushby & Son	16,057	Akers & Co.	14,324
G. Martin	15,946	W. Smith & Sons	13,925
F. G. Minter	15,649	R. B. Ames	13,820
Turtle & Appleton	15,286	Wain walls & Co.	13,775
H. Linfield & Son	15,257	J. J. Pink	13,534
Porter Bros.	15,080	Norman & Burt	13,568
Kingler & Son	15,052	Samuel, Page, & Co.	13,538
Grace & Marsh	15,006		
F. Gough & Co.	14,956		

REIGATE.—For rebuilding coach builder's premises, Bell-street, Reigate, for Mr. Frank Burtonshaw. Mr. E. Penfold, architect, High-street, Reigate:—
W. Wickman..... £1,628 J. Waycott..... £1,285
J. King & Son..... 1,460 A. G. Lovell..... 1,277
G. Eley & Sons..... 1,376 S. Jeal..... 1,268

SEELY OAK.—For the erection of public baths including chimney shaft and storage tank, at Tiverton-road, Seely Oak, for the King's Norton and Northfield Urban District Council. Mr. E. Harding Payne, architect, 11, John-street, Bedford-row, W.C. Quantities by Mr. Geo. Kenrick, F.S.I., 83, Colmore-row, Birmingham:—
W. J. Morris..... £10,038 W. & J. Webb..... £9,000
J. Barnsley & Son..... 9,888 W. Bishop..... 9,477
T. Lord & Sons..... 9,876 B. Whitehouse..... 9,378
J. A. Turton..... 9,858 W. H. Gibbs..... 9,235
J. Dallow & Sons..... 9,790 T. A. Cole & Sons..... 8,899
T. Rowbotham..... 9,707
‡ Revised estimate.

SHREWSBURY.—For concrete foundations and brick superstructure to water tanks at Electricity Works, Roushill, for the Lighting Committee. Messrs. A. B. & W. Scott Deakin, architects; Mr. C. M. Johnston, engineer:—

S. Phillips.....	£596 12	Complete by.
T. Morris & Sons.....	512 0	Three months.
R. Wilding.....	463 0	Ten weeks.
Robertson.....	453 19	May 26.
G. Buttock.....	437 0	April 29.
G. Hickerton.....	422 0	April 17.
H. Price.....	419 0	May 13.

[All of Shrewsbury.]

SOUTHEND-ON-SEA.—For boiler-house extension, for the Corporation. Mr. E. J. Elford, Borough Engineer, Town Hall, Southend:—
P. & E. Davey..... £2,045 S. E. Moss & Co..... £1,777
H. Lovett, Ltd..... 2,000 F. Miskin..... 1,771
H. Windsor & Co..... 2,000 A. J. Arnold..... 1,757
G. W. Smith..... 1,913 R. Eley & Son..... 1,670
Hughes & Stirling..... 1,888 W. & E. Davey..... 1,558
A. & H. Holding..... 1,805 Southend..... 1,558
[Surveyor's protecting tender, £1,716.]

SUTTON-IN-ASHFIELD.—For making alterations and additions to the Town Hall buildings. Mr. J. E. Ashington, architect and surveyor, High-pavement, Sutton-in-Ashfield:—
J. Greenwood, Mansfield..... £1,750

STRATTON (Corwall).—For Widemouth Cliff-road diversion, for the Rural District Council. Mr. W. J. Dunbar, C.E., Lakeard:—
A. G. Oulton..... £7,163 14 0 J. J. Curran..... £2,423 11 2
S. W. Harrison..... 2,386 11 5
W. C. Shad..... 2,342 0 0
J. Riley..... 4,069 2 4
H. Drew..... 3,400 0 0
R. Harris..... 2,678 7 2
E. L. P. Duke..... 2,565 16 4
J. Lucas..... 2,479 18 0
W. E. Bennett..... 2,051 9 0

TEIGNMOUTH.—For kerbing and channelling 450 yds. lineal of roadway, building bridge, and laying 800 yds. of sewers, Winterbourne Estate. Mr. S. Dobell, architect, Queen-street-chambers, Exeter:—
Steer & Pearce..... £2,181 4 7 E. Harris.....
Hawkins & Best..... 1,852 10 0 Clay Hydon..... £1,674 7 0
Lamcraft & Son..... 1,849 0 0 Exeter..... £1,485 0 0
E. Mudge..... 1,783 0 0 Dart & Pollard.....
R. Fowler..... 1,658 0 0 Devon Traction & Motor Co., Ltd..... 1,426 6 2

WALLINGTON (Surrey).—For the erection of two shops and houses, Wallington. Messrs. Warran & Stupart, architects, Harringay, N.:—
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T. Adams.....	697 0 0	319 0 0	1,016 0 0
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G. Bell.....	698 0 0	345 0 0	1,013 0 0
W. & C. French.....	680 0 0	290 0 0	970 0 0
W. Griffiths.....	693 0 0	306 0 0	1,001 0 0
Grounds & Newton.....	730 0 0	270 0 0	1,000 0 0
J. Jackson.....	697 0 0	287 0 0	874 0 0
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Figures occupying corresponding positions to those shown on lower side of drawing.



MEASURED DRAWING OF CEILING MOVER ENTRANCE COURT

The decoration is painted in tempera on a plaster ground, which is framed up with enriched plaster mouldings. The panel representing The feast of the gods is attributed to Luca Cambiaso the rest to Bergamasco.



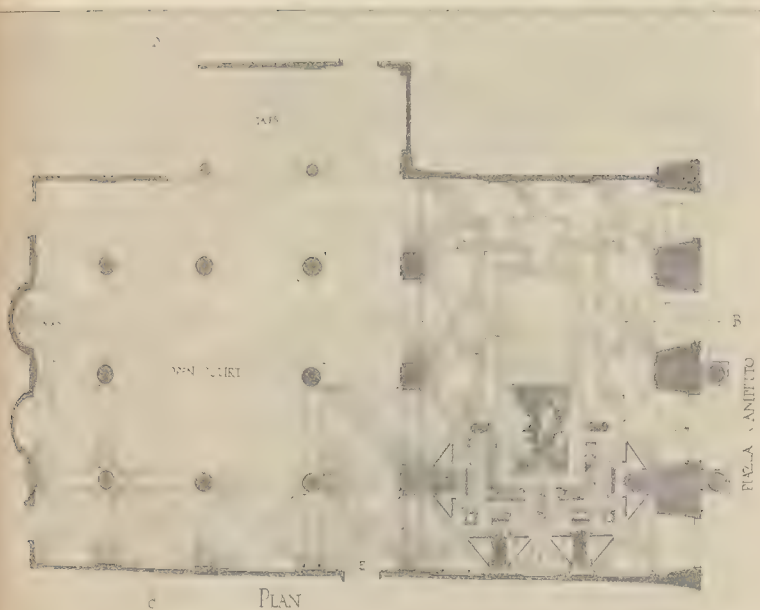
PALAZZO IMPERIALE GENOA 1560

MEASURED DRAWING OF
ENTRANCE COURT

SECTION 'A.B'

SECTION 'C.D'

DRAWING OF VAULT 'E' ON PLAN



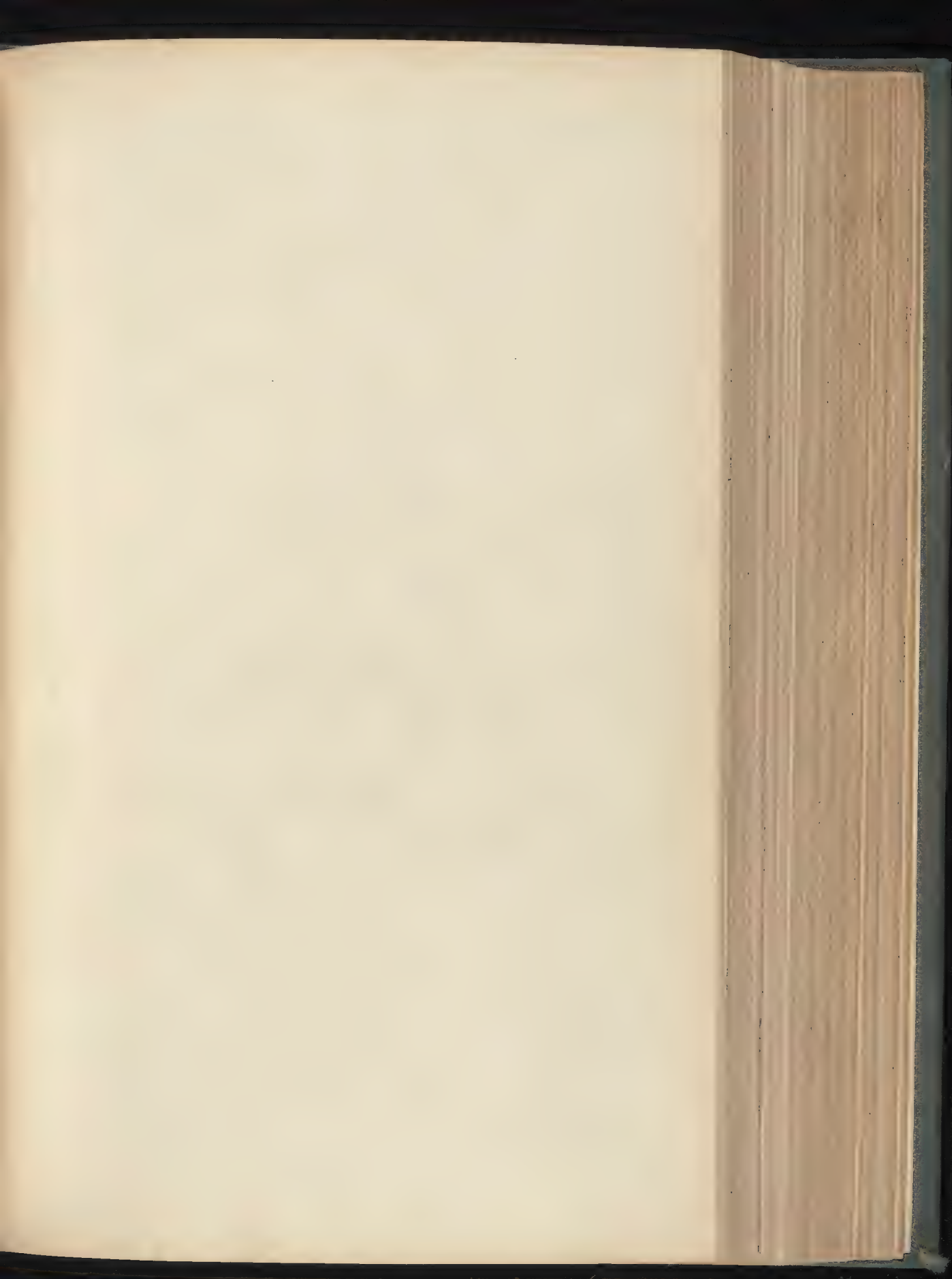
PLAN



DETAILS OF PAINTED ORNAMENT ON CEILING.



MEASURED AND DRAWN BY MR. H. MORLEY



THE BUILDER, MARCH 11, 1905.

♡ A PAIR OF HOUSES ♡
♡ FREEMAN & OGILVY ARCHITECTS ♡
♡ 3 STURGE INN.....LONDON. ♡



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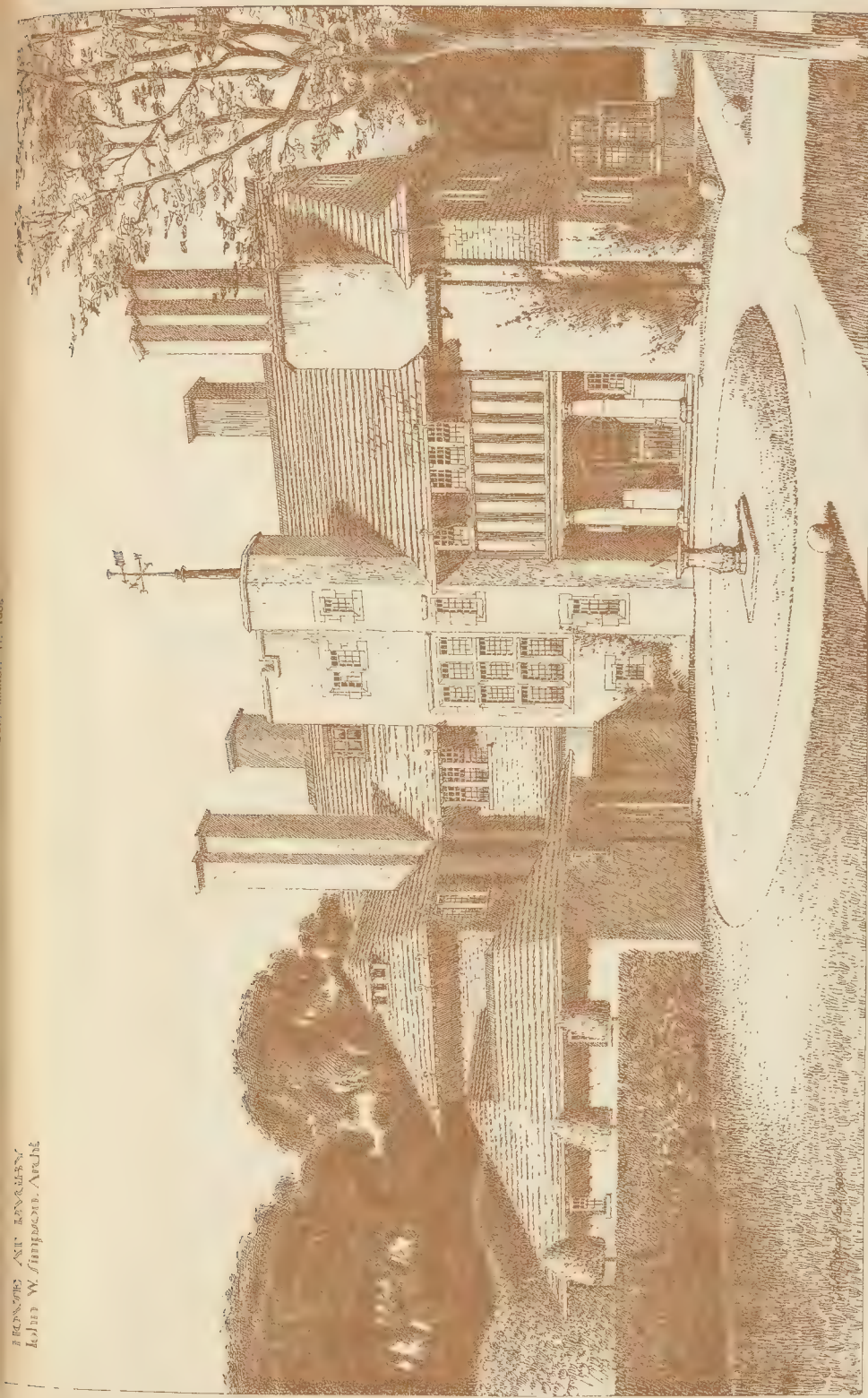


PHOTO LITHO SWAGGUL & CO. 445 EAST HARRIS STREET, ST. LOUIS, MO.

MARCH 18, 1905.

A Working Drawing.....	By Mr. J. S. Gibson, F.R.I.B.A.
Entrance, 42, Great Portland-street.....	Professor Beresford Pite, F.R.I.B.A., Architect.
Details of Entrance, 42, Great Portland-street.....	Professor Beresford Pite, F.R.I.B.A., Architect.
	Sculpture by Mr. F. E. Schenck.
Old Mantelpiece, White Hart Inn, Hull.....	Drawn by Mr. Arthur F. Wickenden.

The "Armocrete" Tubular Floor System:—
Figs. 1 and 2

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A decorative initial letter 'I' in a medieval manuscript style. The letter is formed by a central vertical bar with a flared top and bottom. This bar is surrounded by a complex, symmetrical knotwork pattern that fills the square frame. The knotwork consists of interlaced lines forming a series of loops and knots, characteristic of Celtic or Anglo-Saxon art. The entire design is rendered in a dark ink on a light background.

The objects of the present Bill are to legalise "peaceful persuasion" to enable a combination of persons to do any act, in furtherance of a trades dispute which one person could legally do; and thirdly, to prevent the funds of Trades Unions being made liable for the illegal acts of their servants or agents of the unions. We do not propose to discuss the legal propositions involved in the first two clauses; If the circular received by

fostered by the decision of the Taff Vale case in 1900, and there can be little doubt that this desirable result has been obtained by fixing the agitator with responsibility.

Both sides of the House paid a tribute to the excellent work done by the Trades Unions in their legitimate sphere, and it has been our pleasing duty from time to time to bear tribute to the excellence of their administrative functions, and to recommend the adoption of many of the provisions favoured by them in relation to their benefit societies to the administration of the Workmen's Compensation Act. Any legislation, however, which will foster agitation will not only be disastrous to the trade of this country generally, but will specially tend to injure the working classes by diverting the funds now so ably administered in the relief of sickness and distress to the payment of agitators and of strike pay, and it cannot be too strongly deprecated. That some amendment of the law is necessary we are willing to admit, since it is now only to be gathered from many decided cases somewhat difficult to understand and to reconcile. The Trades Unions are entitled to demand a clear definition of legal and illegal acts, and a limitation of responsibility on definite lines to the acts of their accredited servants and agents; but a sweeping away of the law as now laid down, which imposes responsibility for illegal acts, would be a retrograde movement favourable to the interests of no one but the agitators.

THE DISCOVERY IN EGYPT.

WITHIN the last few days news has reached us from Egypt of the discovery in the Valley of the Kings at Thebes of an undisturbed tomb of the XVIIIth Dynasty, rich with an enormous mass of objects, thickly encrusted with gold. The *Times* of Friday, March 10, contained a detailed account of the circumstances of the find, and as full a description of the objects as was possible in the face of such a mass of material. The existence of the tomb was only discovered on February 12, and it must take time to remove the contents from their hiding-place and transport them across the plain of Thebes to the Nile, whence they can be conveyed to Cairo and examined in detail. Apart from the magnificence of the objects found, the discovery is of special interest from an artistic and historical point of view, and serves to solve a question of Egyptian history and of its relations to other countries which is of interest to many outside the comparatively small circle of Egyptologists.

Akhenaten, the heretical King of Egypt, who abolished for a time the orthodox religion of the country and introduced in its place the monotheistic worship of the *Aton* or disc of the Sun, deserted the capital city Thebes, and built Tel-el-Amarna, which he made the seat of government, and also the centre of his reformed religion. For some years previously a freer and less conventional style of art had slowly been making its appearance in the country, and with the new capital it received an impetus which has made the art of Tel-el-Amarna a marvel at the present day. The delicate and many-coloured glazes, the sculpture, and yet more the frescoes, with their rendering of movement in nature and complete departure from the conventional code of Egyptian art, are most distinctive. With the death of Akhenaten the old order of things once more prevailed, and Tel-el-Amarna, its religion, and its art were quickly deserted and forgotten.

It has long been supposed that Akhenaten inherited his spirit of innovation from his mother, the powerful Queen Tii, wife of Amenhotep III. This monarch, one of the powerful Pharaohs of the XVIIIth Dynasty, came to the throne when about sixteen years of age, and two years later we find the first mention of his Queen, Tii, daughter of Yua and Thua. That Tii was a Syrian, probably from Mesopotamia, has been shown by various pieces of evidence, but whether she was of royal parentage has hitherto been a mystery. The fortunate discoverers of the tomb at Thebes found on a preliminary examination of the two sarcophagi contained in it that they were in the presence of Yua and Thua. Their names are frequently inscribed, with a variety of spelling, which shows the difficulty experienced by the Egyptians in rendering the foreign sounds.

The inscriptions also show that they were by no means of royal rank, or even great officials. Their mighty daughter secured for them a burial of royal magnificence, and appears to have used for the purpose the ante-chamber to a tomb already occupied.

The tomb itself is of simpler form than is usual in that burial place of great monarchs. A flight of steps cut through the face of the rock descends to an entrance-doorway, beyond which a second set of twenty steps leads down to the door, through which access is gained to a chamber 30 ft. long, 15 ft. broad, and only 8 ft. high. Hewn out of the rock, this chamber is neither carefully smoothed nor decorated. When the mass of wealth with which it is crowded is removed it is probable that a passage or shaft will be found leading to the tomb of an original occupant. But it is in this chamber that Yua and Thua lie side by side. Placed first in mummy cases plated with gold and lined with silver, and secondly in similar cases lined with gold leaf, they were deposited in two immense wooden sarcophagi. The objects usually found in wealthy Theban tombs are deposited with them, of exceptional size and of finest workmanship. In addition to these there is a large amount of furniture, among which are chairs finely carved and decorated, and with seats of plaited palm fibre. A large pleasure chariot to hold two persons, with wheels and tyres complete, formed a striking object among the many glittering marvels. When it is possible to examine these in detail we may hope for much light on the art and civilisation of the XVIIIth Dynasty. Yua and Thua appear to have died during the reign of their son-in-law Amenhotep III. Foreign influence is already shown unmistakably in the magnificence of their possessions. Whether these will also indicate a beginning of the fine conception of art which prevailed during the reign of their grandson, Akhenaten, we can only learn when more details are available. That the orthodox religion and worship of Osiris was paramount at the time of their death is proved by the presence in their tomb of a "bed of Osiris," an Egyptian symbol of belief in a future life of which only one example was previously known, taken from the tomb of Maherpra, a prince of the time of Amenhotep II.

The tomb, with its magnificent inducements to plunderers, was successfully protected by the official guards, and, with the exception of one frustrated attempt, remained untouched until its very existence was forgotten. After a lapse of over 3,000 years, the careful and scientific work carried on in the *Biban el Muluk* has been rewarded by the discovery of this dazzling proof of the wealth of the Pharaohs, and which we may hope will lead to yet further knowledge of the relations between Syria and Palestine, and of their mutual influence on art and civilisation.

WEEK-ENDS FOR ARCHITECTURAL DRAFTSMEN. The Betchingley Ramblers gave a very successful concert at Auderton's Hotel, Fleet-street, on Thursday, March 9. This club was formed by assistants in the office of Mr. Leonard Stokes, F.R.I.B.A., for providing inexpensive week-ends in the country, and to afford opportunities for sketching, photography, etc. It is usual for members to cycle down to their cottage at Betchingley, Surrey, on Saturday afternoons. After a night's rest in canvas hammocks provided for this purpose, the members rise early and form excursions into Kent, Sussex, and the Surrey district. The Hon. Secretary of the club is Mr. H. C. Wilkes, care of the Architectural Association, 18, Tufton-street, Westminster, S.W.

THE VENTILATION OF FACTORIES AND WORKSHOPS.

By F. S. LISTER, A.M.Inst.C.E.

FACTORY ventilation is a subject difficult to treat from a general point of view, as the diversity of processes, the conditions under which they have to be carried out, and the type of building which these conditions demand, are so divergent in character that a general uniformity in methods of application is impossible to secure. It has been considered sufficient in defining the degree of ventilation requisite under any particular conditions to state the maximum percentage of carbonic acid gas which should be permissible in the atmosphere of a workshop.

This, although in itself a satisfactory indication of the purity of the atmosphere from a chemical point of view, is by no means sufficient as a guarantee to satisfactory conditions, as it affords no indication of the degree to which the atmosphere may be charged with matter in suspension. Purity of the atmosphere in this respect is of the most vital consequence to the health of the individual, particularly when called upon to work long hours in a more or less confined space. The continual breathing of air charged with mechanical impurities is fraught with the gravest consequences, as the effect is not transient but cumulative in character; the constant accretion of mineral matter in the lungs or other organs finally setting up by mechanical irritation inflammatory diseases of fatal character. This is especially marked in those particular industries in which grinding processes are carried on. The workman accustomed from early youth to an atmosphere laden with mineral impurity in the form of a very light dust may continue for years with no appreciable impairment to health resulting. Then the insoluble foreign matter present in his organs may unexpectedly set up a fatal inflammation. Grinder's colic is a well-known disease in the Midlands, and to those cognisant of its destructive effect, any means by which it may be averted are to be welcomed.

The methods by which effective ventilation is secured are numerous, and depend as regards their adaptability, on the character and constructional arrangements of the building. Obviously a building comprising a number of small rooms must be treated in a different manner from a workshop which is practically open from end wall to end wall and from floor level to roof. Ventilation of factories can be placed under two categories:

1. The general dilution of the air within a building by a continual incoming stream of fresh air.

2. The abstraction of air charged with matter in suspension, dust or fumes, at the point where such dust or fumes are created.

The ventilation of any building may be attempted either by natural methods—that is to say, by the employment of natural agencies such as wind, etc., or by aspiration, by which the continual upward flow of a volume of air is secured, by the direct application of some heat source; or again by mechanical methods.

by which the air is either exhausted from or discharged into the building at known velocities, and consequently a more or less exact interchange is secured.

Natural methods are obviously erratic in character, and depend upon the disposition of doors, windows, etc., and, although usually considered sufficient for domestic conditions, have very uncertain effect when ventilation of large open buildings, such as workshops, is considered.

Aspiratory methods are inefficient owing to the difficulty in setting up a sufficiently high velocity of air-current by the lessened density of the air, and further, are extremely costly in heat expenditure, as the heat expended in inducing the current is carried away to the outer air without doing further work.

Mechanical propulsion of the air is the only true means by which the conditions of ventilation may be actually regulated and definite results secured. Whether we proceed on the "Exhaust" system or on the "Plenum" system, in either case a fan, either of propeller or centrifugal type, is the means employed, as no other form of machine has been found so convenient or economical of power for the transmission of air.

The exhaust method of ventilation has been more generally adopted, as it is essentially simple in character, the general method of adaptation consisting simply in the location of an extract fan in some suitable position on the exterior walls of the building which it is desired to treat. Thus, say, in a large foundry, the sole provision for ventilation may consist of extract fans fixed in the gable ends of the roof. But apart from simplicity and comparative low cost, there is little to recommend the exhaust method, as it is impossible by its use to guarantee that an equal diffusion of fresh air be obtained in every part of the building. The rapid removal of the air by the action of the fan has the effect of creating a tendency to vacuum within the building, which is immediately counteracted by the rush of fresh air to any available inlet; unless, therefore, inlets of exactly proportioned area are distributed uniformly over the outer wall surface it is impossible that any real interchange of air will take place at points distant from the fan, and not in the line of direct currents. The flow of air from the fan naturally following the line of least resistance, the supply will be drawn from the nearest available inlets, and will proceed in straight lines to the fan.

Again, the exhaust method has the obvious disadvantage that in winter time, if any considerable degree of ventilation be necessary, the temperature within the building may rapidly fall below that which is desirable, as it is impossible to control the temperature of the incoming air, more particularly when the inlets are distributed over a wide area, which, as we have seen, is necessary for efficient ventilation.

By the "Plenum" system these difficulties of temperature regulation and exact distribution of the air are easily overcome. Though the term "plenum" implies the tendency to create a slight excess pressure of air within the building, this excess pressure does not actually

exist if the vitiated air is permitted to escape at sufficient suitably distributed outlets. As the whole of the incoming air passes through the fan by which it is distributed, it is possible, owing to this controlled admission, to raise it to any desired temperature by directing its flow through a heater of suitable construction, and equally with the heating process it is possible to effectively moisten or filter the air, arrangements which obviously permit the most effective control of the atmospheric conditions.

The apparatus usually employed consists primarily of a centrifugal fan capable of moving large volumes of air at a pressure sufficient to overcome the resistance of the ducts which may be necessary for its conveyance and distribution. Such a pressure may be considered as limited to about 1 oz. to 1½ oz. per square inch. To raise the temperature of the air to the desired degree a steam heater is usually employed, consisting of a series of well-arranged coils in parallel planes over and through which the incoming air is made to pass. Such a heater may be arranged in sections, permitting, when desirable, one or more sections only to be employed. Where a supply of exhaust steam is available considerable economy may be derived from its utilisation, as it may then be condensed in the heater coils, the latent heat on liberation being utilised to raise the temperature of the air. If a source of steam be not available a furnace heater may be employed, in which coal, wood, or any other type of fuel may be satisfactorily burned, the products of combustion passing through discharge flues with gilled radiating surfaces, over which the entering volume of air is made to pass.

In order to distribute the fresh air volume, a main supply duct may be run underground, from which branch pipes may be constructed either within the walls of the building to be treated, or, if such an arrangement is impracticable, the branch distributing ducts may be carried along the interior surface of the wall. If the workshop in question is constructed with internal rows of columns, these ducts may be attached to the columns. In workshop practice it is usual, in order that the best results may be obtained, to finally carry down short discharge pipes to within a few feet of the working floor levels. The diffusion of the fresh air supply in such a case takes place on the most effective plane and permits the workman to derive the best advantage from it.

The apparatus would be most suitably located near the boiler and engine house, but if such a position should be unsuitable, owing to the distance of the workshop to be treated, the adaptability of the plant permits it to be placed in almost any position which is available. Thus it may be carried overhead on a platform fixed to the tie beams of roof, or in an underground pit, or in a shed exterior to the building. It is, however, an advantage in deciding on its exact position to remember that the more central its position the more evenly may the distributing piping be arranged, and the diameter of same be reduced to a minimum. Thus, for instance, if the apparatus be placed at the end of a workshop, it is obvious that the dis-

tributing lines of piping must be of sufficient diameter at the end nearest the fan to allow the whole volume of air to be conveyed. On the other hand, if the fan is in a central position, the maximum diameter of the piping need only be sufficient to allow half the volume on each side to pass.

In workshop ventilation where the processes carried on are not injurious, and where the number of individuals employed is comparatively small, having regard to the cubic contents of the building, a very slight degree of ventilation may be all that is necessary, so that the problem then becomes one of maintaining the internal temperature by the circulation of warm air. In such a case it is economical to arrange that the fan draw a very large percentage of its supply from the building itself. The heat loss is then practically limited to the radiation of heat from the exterior surfaces of walls, windows, etc. Glass surface is the most prolific cause of waste in this direction, and double glazing, although costly, is an advance which is well worth consideration, as it permits a continual economy of heat. On roofs which, owing to the height and inclination of the building, are open to the direct influence of prevalent winds, the heat loss from the glass surface may be very considerable.

In the ventilation of buildings on the "Plenum" system, the facility which the system offers of raising the air to any desired degree of temperature before distribution is a factor the importance of which becomes very marked in certain industries. For instance, in the ventilation of paint shops it is not only important to provide a continuous supply of fresh air, but also to maintain an internal temperature as high as possible consistent with comfort, in order to accelerate the drying process. Again, in many textile processes considerable volumes of steam are given off, rendering the atmosphere within the workrooms unpleasant or even dangerous to work in for long periods. To remove this steam from the atmosphere the most satisfactory method is obviously to introduce a volume of warm dry air capable of rapidly taking up the moisture.

The capacity of air to absorb moisture increases very rapidly with the temperature. If, however, a continuous circulation of air does not take place the warm air rapidly becomes saturated with moisture and incapable of further absorption. It is, therefore, in such cases as instanced, essential not only that the temperature should be maintained within the building, but also that a continuous circulation of air at that temperature should take place. The moisture is then rapidly removed by the outgoing air, and the atmosphere within the building maintained clear.

We have previously referred to the difficulty which is experienced with ordinary methods of ventilation in getting rid of mechanical impurities which may be present in the air, and which arise from the nature of the work carried on. In such cases, to obtain the best results, it is essential to provide means by which these impurities may be removed at their point of creation, and before the dust has time to be diffused in the air:

The most effective way by which this result may be obtained is by a pneumatic or exhaust system. A hood so constructed as to conform to the requirements of the work is fitted to the source of dust and connected to a light exhaust pipe.

In workshops where the tools are uniformly arranged, and are similar in character, it is generally possible to carry the several branch pipes from each machine to a main exhaust duct, which would be connected to the inlet of a centrifugal fan. The speed of the fan should be such as to ensure that the air enter the hood at a definite velocity sufficient to convey the dust in suspension to the fan. For instance, in the case of grinding or polishing wheels, the wheel may be partially surrounded by a closely-fitting hood, leaving sufficient working face to enable the operative to manipulate his work without difficulty. The hood is usually made with an adjustable segment in order that it may have a certain range of adaptability to the varying requirements of the work. In order to maintain the constant velocity necessary to carry away the matter in suspension, the main exhaust pipe should be proportioned to the number of branches. To separate the dust from the air a discharge pipe from the fan is generally carried to a centrifugal separator, which it enters tangentially. The matter in suspension is then carried around the inner face of the separator, falling by its weight through a discharge outlet at the bottom, while the freed air escapes from the top.

Such an apparatus as above described, when suitably proportioned to the actual conditions, performs its work efficiently, and enables the atmosphere of the workshop to be kept at a degree of purity not otherwise possible. This method may be equally adapted for the removal of noxious vapours, fumes, smoke, etc. For instance, in tinning processes where the soldering of tins is performed by automatic machinery, injurious vapours arise from the soldering tanks. If these tanks are fitted with exhaust hoods of efficient design it is possible to ensure the complete removal of the fumes. Another instance to which we may refer is the use of gassing frames for the treatment of fine cotton thread. It is essential for the well-being of the operative that the waste gases arising therefrom should be immediately removed, and this can easily be arranged by covering the frame with a suitable exhaust hood. Brass-workers are another class of operatives who suffer considerably from mineral poisoning incidental to their work, and who would derive considerable benefit from the employment of pneumatic apparatus for dust removal. In saw mills and wood-working shops this "Exhaust" system is now commonly employed for the collection and removal of refuse from the machines, the discharge pipe generally being carried to a separator conveniently fixed near the boiler house, where the refuse can be burnt as fuel.

We see, then, that in order to secure the most efficient conditions of ventilation within the factory, not only is it necessary to provide for a continuous renewal of the air (the necessary rate of

change being determined by the relation of the number of operatives to the cubic space), but that in processes where dust or fumes are continuously generated it is essential to provide suitable apparatus for their immediate suppression and removal. Where such arrangements are efficiently carried out an ample return is found for the necessary expenditure in the health and well-being of the operative, and his greater power of sustained effort and output.

NOTES.

WE congratulate Mr. The Advertisements Richardsons Evans, the Bill, founder of and chief operator in the "Society for Checking the Abuses of Public Advertising," on the passing in the House of Lords last week of the second reading of the Bill prepared by the Society under the title "The Advertisements Regulation Act." The second reading was moved by Lord Balfour in a speech which set forth in moderate but clear language the necessity for legislation on the subject. He said that it was of great public interest to maintain both for the country and the town the beauty and symmetry of our outdoor life. Some of the erections that were seen throughout the country would not be permitted if local authorities had the power to check them. People could not go up the river Thames, travel on many of our great railways, or visit some of the most important health resorts, without seeing large and unsightly placards which deprived them of a great deal of the pleasure to be obtained from looking at the scenery. The cliffs of Dover, he said, were used extensively for advertising, and would be until Dover obtained power to abate the nuisance. The best way to proceed, he thought, would be to lay down a general law, giving the local authorities power to administer it within their area, subject to the control of the various Government departments which had to sanction by-laws. The Bill practically met with no opposition, beyond the suggestion of Lord Belper, who, on behalf of the Home Office, while raising no objection to the measure, said that the question of the powers to be conferred on local authorities would require careful consideration in Committee. The representatives of the advertising interest are of course up in arms against the measure, but we do not think they will be able to do much against it. The feeling against the tyranny of the advertiser is gaining ground very much, and the Bill is likely to enlist a great deal of public sympathy.

THE news that the Society of Arts and the London Institution are about to amalgamate and build a new home for their joint operations is rather a surprise. On the part of the London Institution the principal motive stated is that its geographical position has rendered it more and more difficult for the Institution to carry on its work. We can only judge of this in as far as its excellent series of lectures are concerned; and those are nearly always crowded. In these days of underground railways, and

with the prospect of increased facilities in this respect, geographical position is surely of less consequence than it ever was before, and we feel some doubt whether the removal of the Institution to a western site would necessarily render it more accessible, while one result would be to bring it more directly into competition with the Royal Institution. In regard to the Society of Arts, we learn also with surprise that their premises are only theirs on lease, and they are under a liability to be turned out. That is a reason for their action, no doubt; but if this means (and we fear it will) the impending demolition of their historic house, we should regard such a result with very great regret.

THE news, announced in the Times of the 13th inst., of the existence of one of the inverted columns of the "Treasury of Atreus" at Mycenae, among the collections of the Marquis of Sligo at Westport, and of its presentation by the owner to the British Museum, must have been rather a sensational one to Greek archaeologists. We were aware some time since of the existence of this relic at Westport; and though we had not seen it, had no doubt from description that it was what the owner believed it to be. Considering the historic importance of such a relic, its presentation to the British Museum, now that its value is known, was perhaps the most fitting use to make of it, though the archaeological public ought to feel none the less indebted to Lord Sligo for his generosity; it is not every owner who would give away to a public museum what would have proved to be perhaps the most curious and valuable of his private treasures. The column appears to have been brought over by a former Marquis at the commencement of the last century, in those glorious days when statues and architectural relics of all kinds could be looted from Greece merely for the asking, or even sometimes without asking (witness Cockerell's story of the metope of the Parthenon pitched down the hill to him by the local guardian). We are indebted to Lord Altamont also, who first perceived the value of the relic and went to Greece especially to verify its provenance. The little history is an agreeable one from every point of view.

SINCE our last review of cases decided upon the Workmen's Compensation Act, a case of considerable importance to builders, Plant v. Wright & Co., has been reported in the Law Reports for the current month. The applicant was in the employ of the respondents, who were plumbers, and who had entered into a contract with a firm of builders to do the plumbing work upon a factory which the builders were constructing for the building owner. At the time of the accident the plumbing work had been completed a fortnight, but the applicant was engaged in measuring up this work in order to ascertain the contract price. At this time the builders had also substantially completed their work on the structure under the contract, but work was being done upon the building by another firm employed by the building owner to fit up steam pipes, and this was being carried out by means of a scaffolding

erected by this latter firm. In these circumstances the question arose whether the applicant was being employed by the undertakers upon a building which was being constructed within the meaning of the Act. The Court of Appeal decided the case on the simple ground that the measuring up of the work was ancillary to the main work of plumbing and an essential part of the process. A second contention was raised before the Court of Appeal, that the scaffolding which existed at the time of the accident was not erected by the respondents, but by persons who had contracted to put in the steam pipes, a work which formed no part of the construction of the building. The Court gave no opinion on this point, since they held that it had not been raised in the Court below, but from this recent case of *Fletcher v. Hawley* it now seems that as long as some part of the work of construction is being carried out by the applicant, and scaffolding exists on the premises, it is immaterial whether the scaffolding was erected by the undertakers of the work or by other persons.

New York Harbour. The New York harbour entrance appears to be seriously menaced by the increasing deposit of sand on both sides of the channel, the movement of material being manifested on one hand by the form of Sandy Hook, which has been slowly built up by the northward progress of sand along the New Jersey shore, and on the other by the growth of Coney Island in a westward direction. In a paper read before the annual meeting of the American Association for the Advancement of Science, Mr. Lewis M. Haupt sets forth the great importance of providing for the menace to the harbour entrance constituted by the effects of these littoral movements. From data given by Mr. Haupt it seems clear that there is not sufficient space on the bar for the materials brought to it to be deposited without spreading to the southward and flowing into the channel. Up to the present the only step taken to improve the channel between Sandy Hook and Coney Island has been to commence dredging operations, the intention being to increase the depth of this waterway to 40 ft. It will take at least ten years to remove the original material in this channel, which is reported to have refilled to the extent of from 3 ft. to 7 ft. where work has already been done. Further, as the bar is exposed to the full force of the Atlantic, it can scarcely be possible to maintain an efficient channel by dredging alone. The remedy proposed by Mr. Haupt is to control the ebb currents by a permanent training wall, so as to cause them to cut out and maintain an ample opening across the bar. Such a structure ought to protect the existing channel from littoral drift, and would cost far less than half the amount required for dredging. Auxiliary works might also be advantageous for the purpose of impounding the travelling sand in places where it would be useful instead of injurious, and of preventing the formation of a new beach—something like that at the mouth of Christchurch harbour*—between Coney Island and the sea.

* See the *Builder*, Vol. LXXVI., p. 330.

Conduit Tramways.

THE data recently given by Mr. J. Allen Baker, the Chairman of the Highways Committee of the London County Council, relating to the relative cost of the conduit tramway systems in New York and London are of great interest, as they afford a satisfactory answer to the critics of the London County Council conduit tramways. In New York there were originally forty street-car companies, but the "New York City Street Railway Company" now operates the whole system. The universal fare is five cents (2½d.), and, as a transfer system is used, a passenger may travel fifteen miles for this sum. The average earning power per car mile is 1s. 4½d., while the operating cost is about 7d., so that there is an ample margin for profit. The earning power of the fifty-four miles of the London County Council conduit tramway is already 1s. per mile, and the operating expenses are 7d. In making the comparison, it has to be remembered that part of the New York line has been in operation for over ten years. In London, also, ½d. and 1d. fares are provided, so that the comparison is quite satisfactory. In the important streets of New York a headway of fifteen to twenty seconds is maintained for several hours in the busy part of the day, and so it is not surprising that there are a large number of accidents. Mr. Baker mentions that, by a slight readjustment of the fares, the earning power of the London County Council tramways could be substantially increased. It is interesting to note that the wages for skilled and unskilled labour in London are only about half what they are in New York. The American driver, however, has harder work than the English one. The former has to stand all the time, and, as the speed is 30 per cent. faster than in England, the strain of driving is correspondingly increased. From the engineering point of view, the New York conduit tramways have proved thoroughly satisfactory.

Tests of Electrical Materials.

LAST week Mr. E. H. Rayner gave an abstract to the Institution of Electrical Engineers of a paper on a study of the electrical and mechanical properties of matter which he had carried out for the Engineering Standards Committee. The tests were carried out at the National Physical Laboratory under the superintendence of Dr. Glazebrook, and the results are of great value. In the first part of the paper the results obtained on the insulation resistance and the "disruptive voltage" of many of the materials which are in every-day use for covering electric wires are given. It is pointed out that there is an important difference between the disruptive strength of an insulating material—that is, the ability to resist puncture as the pressure is increased—and the insulation resistance—that is, the resistance to the flow of leakage current across it. A substance which offers great resistance to a flow of leakage current—as, for example, air—may yet be broken down by a comparatively small pressure. We note that the results of the insulation tests are given in terms of "kilo megohms per centi-

metre-cube." Sir William Preece proposed some years ago that the "quadrant cube" in megohms should be taken as a unit, and we have found by practical experience that this is an extremely convenient unit. In this unit the insulation resistance of rubber is about 10, and of "gutta" about 1. Hence we can compare the relative merits of the various materials used by cable manufacturers very conveniently. The materials experimented on at the National Physical Laboratory are mainly suitable for insulating dynamo machines, their insulation resistance being very much smaller than rubber. For this reason, perhaps, the Preece unit has been discarded. In the latter part of the paper Mr. Rayner describes experiments on the temperature distribution in the interior of the field coils of electrical machinery, and his results are of great practical importance to all who have to design or test electrical machinery.

Church of St. Lawrence Jewry, which constitutes the church of the Corporation of the City of London, was built by Wren in 1671-5 at a cost (11,870l. 1s. 9d.) which exceeded that of any of the other parish churches he built in the City; Sir Arthur Blomfield redecorated and rearranged the interior in 1867; the tower, 25 ft. square at the base, rises to a height of 130 ft.; it is in three stages, and is surmounted with an enriched cornice, an open balustrade connects the angle-piers, which carry tall obelisks, capped with balls. On a square base rising from within the parapet rests the turret or lantern which in its lower stage has a round-headed louvre with pediment in each face, a square pedestal above carries a fluted spirelet of lead, octagonal on plan, with a ball and vane—the vane being a grid-iron, emblematical of St. Lawrence's martyrdom. Whilst neither delicate nor refined the composition has a breadth and strength which characterise the elevations of the body of the fabric. The vestry-room and other portions of the interior are richly ornamented with plaster decoration and wooden carving. There are monuments to Archbishop Tillotson and Dr. Whichcote; in the old church were buried Richard Rich, mercer (1469), ancestor of the Earls of Warwick of that house; several aldermen who had served the office of Lord Mayor—amongst them being Sir Geoffrey Boleyn, elected in 1457, and Sir Richard Gresham, who died in 1549; and Thomas, Earl of Wiltshire, grandson of Sir Geoffrey and father of Queen Anne Boleyn.

The Leicester Galleries.

At the Leicester Galleries two rooms are at present filled in a very attractive manner; one containing London landscapes by Mr. Herbert Marshall, the other a curiously varied collection of works by Mr. Arthur Rackham. What Mr. Marshall makes out of London street, compositions and atmospheric effect we all know so well now that it is unnecessary to describe these, which are as good and effective as ever. The subjects are a good deal repeated, but the same scene may have a dozen different aspects under different conditions of light. Among those which please us parti-

cularly are the large drawing of "Evening after Rain—Westminster Bridge" (13), with its stormy sky; "London Bridge" (11); "Morning in Whitehall" (18); "The Sanctuary, from Victoria Street" (25), in which the west towers of the Abbey are very well treated; "Blackfriars Reach" (40), fine in sky and atmosphere; and "Old Essex Wharf, Stepney" (45). Mr. Rackham's exhibition disposes one much more to take him seriously than did his isolated bits of grotesque at the Society of Water-colours, which seemed to us out of place amid their surroundings. But in this collective exhibition we recognise a much greater and more remarkable technical power than we had previously realised, and the possession of a gift of humorous and grotesque conception which amounts in its way to genius. A large proportion of the drawings are illustrations of "Rip Van Winkle," a subject exactly suited to Mr. Rackham's peculiar powers. To be sure he carries the grotesque element a great deal further than is ever suggested in Washington Irving's memorable story, but the drawings are full of a wild inventive fantasy which in some instances is strangely mingled with pathos. In the one (11) illustrating the passage, "His children were as ragged and wild as if they belonged to nobody," the figure of the bare-legged little girl holding the cat is quite touching, and the whole composition and execution clever to a degree. The one under it, too, "Surrounded by a troop of children" (12) is a perfect little composition, and the figures of the children are delightful in their naïve simplicity of action. The artist must love children, he paints them with such sympathy; notice the baby in No. 47. Another very original one is "Strange faces were at the windows" (22), where the scene is inside the room, a woman with her back to the spectator looking out. One is not sure that such talent might not be better employed to a higher end; but at all events this is something totally new and original, and the author is an artist to be recognised. Among the miscellaneous subjects also are some very good things—"Little Red Riding Hood" and the wolf (88); "The Walls of Rothenburg" (76), with a cat walking along a beam in the foreground; and a charming little landscape sketch, "Snow-clouds over Donegal Bay" (69), showing that the artist's talents are not confined to the grotesque.

In two rooms at the new small Goupil Gallery in the Haymarket—rooms in which the light is so unsatisfactory that it is hardly fair to an artist to show his pictures there—there is a collection of landscapes by Mr. Alfred Ward, mostly slight in subject and execution, but showing a decided feeling for landscape composition and sentiment. Of the colour it was difficult to judge on account of the unsatisfactory lighting. A good many of them are what may be called foreground landscapes—bits of orchard spotted with blossoms, or a collection of poppies with a slight indication of distance behind them; these are all very pretty, but rather of the nature of decorative panels. There are some, however, which come more under the head of

landscape in the wider sense, and which are fine suggestions, such as "Cloud Effect, Scilly Islands" (26), "The Mill Pond, St. Osyth" (44), and "A Dry Autumn, Romney Marsh" (46); the last-named especially is an admirable little composition.

WE regret to see, from the Report of the Annual Meeting of the Architects' Benevolent Society (given on another page), that while the demands on the Society's assistance have been larger than usual in the past year, donations have been smaller than they have been for many years. Donations, however, are blessings which may befall a society at any moment, and we do not gather that the permanent subscription list has fallen off, which is the most important point; though it certainly is, as the Chairman observed, rather extraordinary that not more than 5 to 6 per cent. of the members of the Institute of Architects are subscribers. Perhaps the Chairman and Council do not quite realise how poor many architects really are whose names have a good professional repute; but no doubt there ought to be a larger percentage than that able and willing to subscribe.

THE ARCHITECTURAL ASSOCIATION.

An ordinary fortnightly meeting of the Architectural Association was held on Friday last week at No. 18, Tuford-street, Westminster, S.W., Mr. E. Guy Dawber, President, in the chair.

The minutes and nominations having been read, Mr. L. A. Jones was elected a member of the Association.

Mr. Tanner, jun., Hon. Secretary, proposed a vote of thanks to Mr. E. W. Mountford for kindly granting permission to visit the New Sessions House, Old Bailey, on February 25, also to Mr. F. D. Clapham and Mr. Scales (clerk of works) for conducting the party. He also proposed a vote of thanks to Mr. J. Macvicar Anderson for granting permission for a visit to Messrs. Coutts' Bank on February 25, also to Messrs. H. L. Anderson, W. R. Malcolm, and G. J. Marjoribanks for conducting the party.

The motions having been agreed to, Mr. Louis Ambler, Hon. Secretary, announced the following donations to the Library:

Thirteen portfolios and three books illustrating St. Mark's, Venice, being a complete record of the fabric in measured drawing and coloured and photographic plates. Presented by Mr. W. E. Chamberlin. (Mr. Ambler stated that this is a magnificent work, which was valued at about 90*l*. The Association were to some extent indebted to Mr. A. N. Prentice for this gift, for he is a friend of the donor.)

"The Planning of Poor Law Buildings and Mortuaries." Presented by the Author, Mr. A. C. Freeman.

"Houses for the Working Classes," 2nd edition, by S. W. Cranfield and S. I. Potter. Presented by Messrs. Batsford.

"Architecture East and West," by R. Phené Spiers. Presented by Messrs. Batsford.

"The Eighteenth Century Architecture of Bath" (complete). Presented by the Author, Mr. Mowbray A. Green.

On the motion of Mr. Ambler, a vote of thanks was accorded to the donors.

The Chairman announced that the A.A. Students' Smoking Concert was to be held at the Café Monico, Piccadilly Circus, on Tuesday, March 28, at 9 p.m., in aid of the Building Fund. Tickets 2*s*. 6*d*. each, or five for 10*s*., to be obtained at the office or of Mr. W. I. Travers, 2, Phillimore-gardens, W.

House List.

The Chairman also announced the Committee's nominations for the House List, 1905-6. At the next meeting, to be held on March 24, any two members may add additional names of members willing to serve. The following is the list:

President.—Mr. E. Guy Dawber.
Vice-Presidents (2).—Messrs. Louis Ambler, John Murray.

Committee (10 to be elected).—Messrs. R. S. Balfour, Walter Cave, F. D. Clapham, H. Gregory Collins, Alfred Cox, J. B. Fulton, Theodore Fyfe, J. S. Gibson, Henry T. Hare, R. P. Jones, Arthur Keen, F. Lishman, G. Lucas, Arnold Mitchell, H. Passmore, W. A. Pite, E. A. Rickards, J. MacLaren Ross, S. J. Tatchell, Maurice E. Webb, R. Douglas Wells, and A. Needham Wilson.

Hon. Treasurer.—Mr. Francis Hooper.

Hon. Librarian.—Mr. W. A. S. Pettit.

Hon. Secretaries (2).—Messrs. H. Tanner, jun., A. Maryon Watson.

Other officers: Hon. Solicitor.—Mr. W. H. Jamieson.

Hon. Assistant Librarians (2).—Messrs. Edwin Gunn, and C. M. Crickmer.

Law Courts.

Mr. H. V. Lanchester then read the following paper, which was illustrated by lantern illustrations of plans of Cardiff Law Courts:—

When you kindly invited me to read this paper, I selected Law Courts as the subject, not so much in the hope of being able to contribute very much to the knowledge that most of you already possess as because it seems to me that of the various problems in planning that the architect is called upon to solve this is one that involves the use of nearly all the expedients that are demanded, and is perhaps the most typical of the methods to be adopted in matters of arrangement, while at the same time there is considerable scope, in larger examples at all events, for the study of architectural expression.

In this matter of architectural expression the continental nations are noticeably our masters. Comparing most of our public buildings with those of equal importance abroad, while we find that at home they are too frequently pinched and ineffective, wedged into irregular sites, between commercial premises, abroad we see a massive and imposing pile, its dignity enhanced by judicious isolation from all mean and unworthy surroundings, approached by a noble avenue or a spacious square. The rooms are lofty, the corridors wide, and everything is calculated to impress one with the importance of the building and its use; but as far as ingenuity of arrangement goes, it is inferior to the cramped little concern familiar to us at home, and as regards the specific provision for its purpose, very little study seems to have been expended; in many cases an outline plan would hardly inform one whether the building was municipal, legal, or residential in its intention, while few modern plans in our own country would fail to show at a glance whether they were for town hall, law court, or palace. Last we should feel inclined to congratulate ourselves unduly, it behoves us to consider whether we do not attach too much importance to our clever little schemes for specialising the routes and entrances in our designs, and whether the Englishman's mania for privacy is not carried beyond what is either essential or desirable. I certainly incline to this view myself, and think that we should occasionally make some concessions in minor points, if by such a course we can strengthen, if one may use the term, the dramatic force that a fine architectural treatment exercises. As an example of the importance attached abroad to worthily and suitably expressing the purpose of such a building, one need only cite the Law Courts of Brussels, where the intention of impressing the mind with the power and dignity of the law is so successfully fulfilled. The Courts at Paris, though most interesting in themselves, are less suitable as an example, for, in spite of Duc's masterpiece, they represent, as a whole, a gradual aggragation which cannot be regarded in the same light as a completed study from one hand.

While far from desiring to detract from the design for our own Courts of Justice, combining as it does remarkable grace of detail with vigorous composition, it must be admitted by all that the internal arrangements fail, both from a practical and an architectural point of view, the chief defects being the divorce of the great hall from the courts and the consequent meanness of the approaches to the latter. One of the most striking and typical examples of assize courts is that at Manchester, by Alfred Waterhouse, of which a plan is published in the *Transactions of the Institute of June 12, 1903*. If you refer to this you will note the skill with which the somewhat complex problem is met, and, taking into consideration the fact that the public galleries are practically on the same floor as the courts, the satisfactory separation of the officials, Bar, and witnesses, with the consequent avoidance of awkward cross currents.

You are doubtless familiar with the plan of the Birmingham Courts, which are universally considered to be most admirably arranged. In this case the large hall is in daily use, as it serves both as an assize court; in fact, the latter are very much used throughout the year, and the large hall is a great convenience.

In the case of the Old Bailey courts, the site was a somewhat limited one for the accommodation required, and on this account the problem is treated in a simpler manner. As you have it most of you recently visited the building, it is hardly necessary to embark on a detailed description, and may suffice to mention that pairs, courts are grouped in two adjacent pairs, separated by the main staircase and lighting area, while a corridor in front serves witnesses and Bar, and another behind the Bench, the judges and juries, the barristers' rooms are on an upper floor, and a suite at the south end of the building is provided for the Lord Mayor and City authorities.

Cardiff Law Courts.

Very fortunately for us the site provided for our work at Cardiff is quite an exceptional one, and though not laid out with the skill that one sees exercised in France or Germany, it is nevertheless of a noble spaciousness and liberality, so that the buildings stand four square, open on all sides, and the facades only broken by the surrounding trees. The design of the Cardiff courts was, to a great extent, governed by the relation of the building to the town hall on the east side, to which it corresponds in architectural detail, and in its dimensions from north to south. This also suggested the arrangement of the assize courts and their adjuncts on an upper floor, though such a course is in this case justified on economic grounds alone.

The very general objection to the placing of the courts on the first floor is to some extent met by the arrangement of the steps, those not external forming as it were part of the design of the assize hall or *salle des pas perdus*.

You will, I trust, understand that in illustrating my paper by means of these plans, it is not with any idea of their representing a standard type; as a matter of fact, the conditions themselves preclude such a supposition, but that such a course makes it easier for me to formulate the various points with which I ought to deal.

With the plan before us I should mention that the buildings include the following:—

The Assize Courts.

Police and Wreck Courts.

The A Division Police Station.
The Chief Constable's Offices.

Beyond pointing out on the plan the accommodation allotted to the two latter, I do not propose to refer to them, as they present but few variations from the usual practice. Basing our ideas on the examples quoted, it will be best to commence with the Assize Courts, and taking one of these and its surroundings in detail, the practical problems that I referred to at the commencement of this paper will become obvious.

We shall not then need to consider the lesser courts at the same length, as they will follow to a large extent the same principles. You have in those attending the court the following six main divisions:—

1, Judge; 2, jury; 3, Bar; 4, witnesses' solicitors (and litigants in civil cases); 5, prisoner and police; 6, public—each of which it is desirable to keep to some degree distinct, while the first two must be able to pass direct to their retiring-rooms without emerging into any of the general corridors.

You will see at once that it is practically impossible to secure this degree of sub-division on one floor, but the removal of the public to an upper gallery, and provision of steps from the dock to a lower floor for the prisoner, simplifies things very much.

A corridor in front of the court will serve division 4, and also jurors in waiting and when discharged. Corridors on one or both sides will provide for the Bar and officials, while the judge enters (through his private room) from suitable access provided at the back of the Bench. Thus we may mentally picture as the ideal arrangement a central block consisting of the court plus the judges' and jury retiring-rooms, surrounded by a corridor, outside which are suitably placed the various rooms for officials, Bar witnesses, etc. Taking this as a starting-point, it will almost inevitably occur that exigencies of lighting, access, etc., will demand modifications; for instance, the courts may require to be grouped, as at Birmingham and the Old Bailey; the site may be too small to

allow of all the rooms on one level, as at the High Courts; or, again, the lighting of a lower floor may have to be considered, as is the case in our building at Cardiff. At the High Courts of Justice the officials' and barristers' rooms are very ingeniously dealt with on a mezzanine below the judges' rooms, etc., at the back of the Bench; the Bench being raised, these rooms are conveniently near the level of the court. On the other hand, the jurors' retiring-rooms are not well managed, being in the basement, two floors below the court level. The witnesses' rooms are next in importance, and if it is difficult to place those in close proximity to the courts, an enclosed space may be provided at the back of the court for witnesses immediately wanted, though, I think, the more usual provision of a few seats in the court and a good room close at hand preferable.

The Grand Jury, an important factor in the conduct of our Assizes, need not be in such close touch with the court, as it only assembles there at the commencement of the session to receive the judge's charge, and then withdraws to deal in a preliminary way with the cases. It hears sufficient evidence to decide whether a case should proceed or not, and its communications are handed in to the Clerk in the form of a "true bill" or otherwise.

The Grand Jury, twenty-four in number, is drawn from the magistracy and more important residents in the circuit.

It is a general practice to put its rooms on an upper floor with an opening into the court by which the bills can be delivered on the usual "fishing-rod." The arrangement of our building enabled us to put a gallery in the court which would accommodate the Grand Jury while being charged, but it is very possible that judges will prefer to have them in the body of the court instead.

Arrangements of Courts.

Before going into the arrangements of the courts themselves it is worth while to run through a short schedule of those for whom accommodation must be provided.

Assize Court (Criminal)	Sheriff. Deputy sheriff. Judge. Judge's marshal. Judge's clerk. Assistant clerk.	Jury of twelve. Jurors-in-waiting	Bar.	Witnesses and solicitors. Ushers. Official reporter. Press.	Prisoners, Warders, and Police.	Public
Assize Court (Civil)	As above.	As above.	Bar.	As above and litigants. Applicants. Witnesses and solicitors.	None. Prisoners and Police.	do.
Quarter Sessions (Appeal from Police and Petty Sessions in minor cases, licensing cases).	Magistrate, with chairman of bench or a recorder. Clerk.	None.	Bar.	Prosecutors. Witnesses and solicitors. Press.	Prisoners and Police.	do.
Petty Sessions (Country police court).	Magistrates or stipendiary. Clerk.	None.	Bar.	Prosecutors. Witnesses and solicitors. Press.	Prisoners and Police.	do.
Police Court	Magistrates or stipendiary. Clerk.	None.	Bar.	Ship's officers. Witnesses and solicitors. Press.	None. Police.	do.
Wreck Court	Stipendiary. Nautical assessor. Clerk.	None.	Bar.	Plaintiff and defendant. Witnesses and solicitors.	None.	do.
Sheriff's Court (Compensation cases and assessment of damages).	Deputy sheriff. Clerk.	Jury of twelve.	Bar.	Plaintiff and defendant. Witnesses and solicitors.	None.	do.
County Court	Judge. Registrar. Clerk.	Jury of five.	Bar.	Plaintiff and defendant. Witnesses and solicitors.	None.	do.
Coroner's Court	Coroner.	Jury of twelve.	Bar.	Witnesses.	Occasionally prisoner under escort.	do.

We now come to the details of the Court Room itself. Taking Assize Courts first, we find that the usual form of court is now a short oblong with a width of 30 ft. to 40 ft., and a length of 40 ft. to 60 ft., but at Gloucester the courts (erected some sixty years back) are semicircular in form, with the seating in concentric semicircles struck from the judge's throne; this arrangement seems a good one, both practically and architecturally, and might, I should imagine, be more frequently employed where the site is suitable. We will assume, however, that the rectangular plan is adopted. After arranging for the Bench, which should be about 25 ft. long by 6 ft. or 7 ft. in width, and raised 2 ft. 6 in. to 3 ft. above the floor of the court. The chief point on which any difficulty arises is the position of the witness-box; this should not be less than 10 ft. or more than 12 ft. from the judge, and should again be within 12 ft. or 14 ft. of the examining barrister and the jury. If much further than this the witnesses' replies may not carry, and the facial expression which is sometimes important may escape observation. It is more usual to put the witness on the other side of the judge than that occupied

by the jury, with the advantage that the witness practically faces the jury-box when under examination, but with the disadvantage that remarks audible to the barrister and judge may not reach the jury, who are generally less inclined to interpose in asking the witness to speak up. After consulting authorities of great experience, we decided to place the witness-box on the jury side, pushing the latter slightly further down the court than usual, so that they get at least a profile view of the witness. The witness-box should be 2 ft. above the floor, and should have a small table-top for documents or other articles produced in evidence. In front of the Bench, and about a foot below it, are seats for the judge's clerk and officials assisting him, and in front of these on the floor of the court the tables and seats of solicitors, while on the opposite side to the jury-box are placed the official shorthand writer and the Press. Behind the solicitors sit the barristers, and behind them is the dock. In the court where civil cases are heard this dock is convertible into additional seats for the Bar, or for special witnesses, experts, etc., while the bank of seats at the back of the court provides for witnesses and jurors-in-waiting.

Police courts follow much the same general arrangement, with the exception that no jury-box is required, while the cases are usually disposed of much more rapidly. The public may either be in an upper gallery or on raised staging at the back of the court. The prisoners are usually brought into the dock by means of a staircase from below, but at Cardiff they come in on the level from the cells corridor, which runs along the side of the courts; to our mind this is the more expeditious method. You will see that these courts are in our building approached from three sides, and that the grouping of the two avoids cross lines of traffic as far as possible in such a case.

The Wreck Court is presided over by the stipendiary, and a nautical assessor, and deals with such cases as the name implies, those attending being chiefly engaged in the mercantile marine.

Heating, etc.

The buildings are heated by the atmospheric steam system, the steam being slightly below atmospheric pressure; the boilers are in the basement of the town hall, and pipes are brought through a subway connecting the two blocks; the courts and other rooms are supplied with fresh filtered air, driven by electric fans through steam-heating batteries, and carried by means of ducts and flues to suitable points. Extraction flues and ducts are carried to blowers in the two towers. It may interest you to hear, what I only knew myself a few days back, that this is practically the same system as was adopted in the court rooms at Manchester over forty years ago; though, of course, many variations in detail have developed in the meantime. At all events, experience has proved that for rooms as much occupied as courts some form of mechanical ventilation is essential.

Architectural Character.

You have, I imagine, formed a fair general idea of the requirements in buildings of the class under consideration, and not wishing to extend these remarks unduly, I propose only to briefly

refer to the general character which might be expressed architecturally in a building of this class.

A certain austerity should, without doubt, be the prevailing note, but this should be most emphasised in the justice chamber itself, where the presence of ornament and useless accessories would be distinctly out of place.

The Assize Hall, however, presents an opportunity which is scarcely to be found in any other description of building. Severe in treatment though it should be, it is yet a link between the outer world and the solemnity of the tribunal; as it leads to the various departments, and has to provide for the freest perambulation, it includes more than one vista, and affords scope for the romantic treatment that one associates with an exchange or public loggia where the learned might exercise their imagination and find inspiration in a sense of space and rhythmic form such as a well-designed apartment of this importance and character should suggest.

A feeling of the open air quite apart from the matter of ventilation should be imparted, and any sense of confinement would effectually mar the relief which such a hall affords those who have felt the tension of a hardly fought case. Balconies to the open air, provided their outlook is not too exciting, would be valuable as adjuncts, and mysteries of light and shade might be sought for.

A considerable uniformity of material would seem to be desirable, such as could be secured by a vaulted room in stone with a stone floor tempered by the introduction of other materials, if they are used only in the broadest way.

Such a hall offers great opportunities of an almost purely architectural character, and the use of ornament and sculpture need not be excluded, though these adjuncts are capable of a freer treatment in the exterior of the building. It may be remembered that a "Palais de Justice" is not a prison, and that in the hands of an artist, dignity and balance may achieve a result typifying the magnificence of the law, which is no terror to those who have no reason to fear it, and a palace of justice as a monument to a merciful institution might well have some elements of gaiety in its composition.

Mr. Francis Hooper, in proposing a vote of thanks to the lecturer, said he congratulated Mr. Lanchester and his partner on the opportunity they had had at Cardiff of creating what might almost be regarded as a record in Courts of Law, for he knew of no other town in England where restrictions had not hampered the ideas of the architect. In London the Royal Courts suffered through the shortsightedness of the Government of their day, who cut down Mr. Street's design, and prevented him from covering the whole even of the limited ground at his disposal. One felt in going into the Courts how much better it would have been if that space had been devoted to building and to the provision of those approaches which Mr. Street was so anxious to secure.

Mr. Lanchester had referred to the Courts of Justice at Brussels, and no doubt some of them had had an opportunity of visiting that city and of admiring the work of M. Poelaert. It used to be said the Law Courts there were to be a monument to Justice, but the King of the Belgians, he thought, said he regarded them as a monument to Architecture and the architect. Externally they were majestic and impressive, and to the student of architecture very interesting on account of the attention given to the smallest detail of design, the furniture and fittings being all carried out under the immediate direction of the architect. Mr. Waterhouse's Courts at Manchester, carried out forty years ago, must have been one of the earliest buildings to establish his repute.

Mr. E. A. Rickards, who was called upon by the Chairman, seconded the vote of thanks, and said that nothing he could say on the subject would be of additional interest, for his views coincided with those expressed by Mr. Lanchester.

Mr. Baxter Greig, in supporting the vote of thanks, said he had been surprised to find that the lecturer had not referred to any point of historical interest in connexion with the subject, which seemed to be an eminently modern one, and there appeared to be no question of architectural precedent or of mediæval or antiquarian interest which was of importance and would guide one as to the principles to be followed either in planning or in architectural treatment. He had, however, expected

Mr. Lanchester to make some remarks upon the history of law courts—to the origin of our present method of dispensing justice, and perhaps to have given some indication of the rise and development of the procedure. In the treatment of modern subjects the employment of modern materials was perhaps more justified than in other classes of buildings. Mr. Lanchester had not discussed the question of the most suitable materials for use, but he spoke of the use of stone. In the Royal Courts of Justice in the Strand the effect was rather cold. There must be a great amount of heat absorbed by the walls and floors of such material over and above what was necessary to warm the building, and it seemed to him that wood and plaster were very good materials for the internal treatment of such buildings.

The Chairman, in putting the vote of thanks to the meeting, said he was afraid it was somewhat of a specialist's subject, and that was the reason for such a short discussion. He thought they must congratulate Mr. Lanchester and his partner on the opportunity they had had of putting up two magnificent buildings on such an open site. He quite agreed with what Mr. Lanchester had said as to the cramped conditions under which we had to erect our public buildings in England. One was struck with that in continental towns, for there the town halls—in mediæval days, he supposed, they were used to dispense justice in—were always made the principal feature, and were generally situated in an open square, gaining thereby very much in dignity. They dominated the place and spoke for themselves. At Cardiff Messrs. Lanchester & Rickards had a similar opportunity, for the open space in which the buildings had been erected enabled them to be seen on all sides. Our Law Courts in the Strand were very cramped and shut in, and though picturesque, of course, one could not get an idea of them from the street such as one got at Brussels of the Law Courts there. In an old country like England it was perhaps utopian to hope to get these buildings in open surroundings, but it was the cramped situation which detracted from many of their beauties, and architects were generally and unfairly blamed for this.

The vote of thanks having been very heartily agreed to,

Mr. Lanchester, in reply, said he had heard the use of the word "specialist" once or twice. He did not believe in specialists, and he did not think there were such things. He could say that he and his partner knew more about law courts now than they did when the foundations of the Cardiff buildings were put in, but that would be the experience of anybody. It was merely using one's instinct as an architect to the matter in hand, and an architect could deal with one building or another if he knew the conditions to work to. He strongly objected to being developed against his will into a specialist. He was sorry he had disappointed Mr. Greig in not saying anything as to the historical development of courts, but he was afraid he was ignorant on the subject; perhaps someone could give a paper on the subject on a future occasion. His was a practical paper, and it dealt with the subject from the modern point of view, and not the historical. A good deal of one's work consisted in following modern efforts and trying, if possible, to go a step beyond. That was the tendency rather than going back and treating buildings in a traditional manner. Fifty years ago the development which had taken place would never have been thought of. As to the use of stone, they had not used stone for the actual courts, but only for the great hall. The sides of the courts were of wood up to 14 ft., and above that was plaster. The President had said that good sites could not be got in an old country like England, but England was not older than continental countries, and in the cities of Europe good sites were found for such important buildings.

The Chairman announced that the next meeting will be held on the 24th inst., when Mr. A. Needham Wilson will read a paper on "Sketch Plans and Working Drawings." The meeting then terminated.

THE NEW YORK WATER-COLOUR CLUB.—The New York Water-colour Club will hold their first exhibition, in England, at the Modern Gallery, 61, New Bond-street. The exhibition will consist of over 100 works, contributed by about seventy members, and will open to the public on Monday next.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

IV.—UNIVERSITY COLLEGE HOSPITAL.

IN spite of the inclement weather the fourth spring visit, held at the recently-completed buildings of University College Hospital, Gower-street, was well attended, and facilities were kindly given by the authorities of the institution for examining all the departments which are in working order. The occasion was made additionally interesting to the members by the presence of the architect, Mr. Paul Waterhouse, whose information and descriptions were much appreciated.

As is well known, the hospital is the gift of the late Sir J. Blundell Maple. We gave a bird's-eye view and plans, together with a general description, in our issue of October 17, 1896, and our present intention is to give some impressions gained from an inspection of the actual buildings.

The scheme, as completed, is a rebuilding to about double the extent of the original hospital, and the island site measures about 230 ft. along each of its four sides. The whole area is occupied by a basement story, containing kitchens, laundry, heating chamber, dining-rooms, baths, casualty and out-patients' departments. From this point four wings, containing the wards and staff residential quarters, rise to a considerable height and are placed diagonally, reaching to the extreme corners of the site. To extend the capacity of the wards each arm of the cross thus formed is increased by large transepts. The extremities of the arms are utilised for sanitary departments, which are disconnected from the wards, and provided with emergency staircases. The central building, from which the four wings are approached by open bridges, contains main staircase, lifts, operating theatres, board-room, and secretarial offices.

Colour in peculiar combination enters into the design of the hospital throughout. For the exterior, red terra-cotta enrichments in almost every conceivable place, relieved with a few buff bands, red machine-made facing bricks, and green slate roofs are used.

There is monotony in the redness of the fronts, as the bricks and terra-cotta have but little contrast. The smoothness of the former assimilates too much with the dressings; a sand-faced brick would have given vigour and life to the fine masses of the wings. The terra-cotta enrichments appear to fulfil structural purposes, and, although reconciled to hospital necessities, have a character difficult to describe, but the effect suggests a last flicker of the dying embers of the Gothic revival as applied to secular works. To the interiors a somewhat unpleasant result is obtained from the particular colours in combination. The large outpatients' waiting hall, for instance, is unhappy in the mixture of dull marbles, alabaster, and glazed bricks. The dadoes in the wards are similarly uninteresting, but the operating theatres alone achieve the smart brightness which should be generally visible. The absence of "finish" is in a great measure due to the almost entire use of glazed bricks, and the consequent large joint, whereas tiles or opalite material, such as is used in the theatres, which require small joints, would have met the objection. Curiously enough, the walls in wards which were first built were painted from the floor upwards, and as such are capable of thorough cleansing.

The total accommodation provides for 301 beds for patients, ten bedrooms, with sitting-rooms for medical officers, 89 for nursing staff, and rooms for twenty servants.

The whole of the works have been carried out without a contractor, under the management of Mr. Thomas Holloway, and the hospital is a successful and most valuable addition to the healing institutions of London.

THE WELSH NATIONAL MUSEUM.—The Carnarvon Town Council have decided to make representations to Lord Balfour of Burleigh's Royal Commission in favour of the adoption of Carnarvon Castle for purposes of the proposed Welsh library and museum. On the other hand, similar claims are advanced by the Corporation of Cardiff, who have expressed their willingness to offer a site, valued at 20,000*l.*, in aid of the building fund, and to subscribe liberally towards the maintenance of the museum and library; whilst Swansea is prepared to give the Royal Institution there, with its contents, as a nucleus of the museum.

THE ARCHITECTURAL ASSOCIATION
CAMERA AND CYCLING CLUB.

At the meeting on Tuesday last, Mr. F. C. Mears read a paper on "Fifteenth Century Houses in Somerset," being a description of the Pugin Studentship Tour, illustrated by photographs taken during the tour, and by plans of the buildings measured. Mr. Mears found that there are very few existing houses in Somersetshire of an earlier date than the XVth century; the majority seem to have been built of wood, and were rebuilt in the XVIIIth century. A highly skilled school of joiners flourished in the county, but little of their work remains, and, owing to the nature of the country, the roads formed no possible means of transit for stone, all of which was carried by water during flood time. The stone for walling is invariably rubble, the dressings having been brought ready worked from one of the quarries, such as Ham Hill, situated in the high ground surrounding the great marshy plain which forms a large part of Somersetshire. The result is that very frequently stone is found at great distances from its quarry. Buildings could easily be divided into two divisions, those built by the local workmen and those built by an architect, who introduced applied ornament and symmetry of arrangement. The latter class were usually picturesque, but often inconvenient, and gave the impression that the designer wished to exhibit his skill. Roofs were covered with graduated stone slates; the hall was almost always carried up through two stories and covered with an open timbered roof. The bay window or oriel in the hall becomes in later times a small private room, sometimes divided from the hall by a screen, and generally used as a thoroughfare, through which the solar could be gained. The oriel was provided with a fireplace whose flue was gathered over to the stack containing the fireplace flue of the hall. Stairs were often circular, and the steps formed of tree trunks quartered. The floors are formed of large beams about 18 in. by 12 in., with floor boards about 2 ft. wide and 2 in. thick. Very little panelling is to be found, but the walls are plastered. Internal porches giving access to three rooms are a feature. Ground floors are paved with stone, the slabs being arranged diagonally. Windows are very similar to those found in the churches, and were always glazed with leaded lights, sometimes with stained glass.

MAGAZINES AND REVIEWS.

THE *Art Journal* opens with an article by Archdeacon Sinclair under the heading "Church Work at Great Warley," which seems to be really a description and illustrations of the work designed and carried out for that church by Mr. W. Reynolds-Stephens. Some of the special objects illustrated have, if I remember right, been exhibited at the Royal Academy. The sanctuary of the church, of which a view is given, has been "designed throughout" by Mr. Reynolds-Stephens; that is, we presume, the decorations, as Mr. Reynolds-Stephens is not an architect; indeed, Mr. Harrison Townsend's name is mentioned as the architect, but the article seems to take very little account of the building from an architectural point of view. The decorative treatment is something refreshingly different from the productions of the usual church furniture purveyor, and we have no doubt that the church makes a very interesting interior; but we should say that the whole effect is rather too restless and rather too much pervaded by an effort to do something original. One desires a certain repose in a church, and Mr. Reynolds-Stephens's designs seem to be constantly raising questions of style; they are, in fact, too clever and too restless in line. The "chapel screen in walnut and pewter," for instance, is far more curious than beautiful; there is a want of refinement and a want of the sense of scale about these large busby scrolls and conventionalised vegetable forms. The metal chancel screen (exhibited at the Academy) is much better than this; but, as we said at the time it was exhibited, the metal foliage is far too realistic, and there is a ruggedness of line about it which does not harmonise with an architectural setting. The altar rail design, as a whole, is very pleasing in line, but the realistic circles of stems are bad as design when examined in detail. The world, the central world of art, as represented by the Greeks, the Gothic carvers, and the men of the Italian Renaissance, has long come to the

conclusion that realistic imitation of details of nature is the wrong thing in ornamental work; and that principle will not be easily upset. Under the title "A Disciple of William Morris," Mr. Lewis F. Day writes an article on Morris and his firm and on the designs of Mr. H. Dearle, who was for a long time Morris's most important assistant in the designing of textiles and wall-papers. Mr. Dearle's designs that are illustrated are excellent types of conventionalised foliage treatment, to which the attention of the designers of realistic leafage might well be drawn. A fine reproduction in colour of a portion of Burne-Jones's design of "The Adoration of the Magi" accompanies the article. The frontispiece to the number is a reproduction of Whistler's "Miss Alexander."

The most interesting article in the *Burlington Magazine* is that by Mr. Francis M. Kelly on "A Knight's Armour of the Early XIVth Century." The article is founded on an inventory in mediæval French of the arms and equipments of Raoul de Nesle, Constable of France, who was killed at the famous "Battle of the Spurs." The document is given complete at the end of the article, with a paraphrase in English. The object of the author is to identify and illustrate all the articles enumerated, or the more important of them, by a diagram figure of a knight in armour of the period, prepared for the purpose, and supplemented by illustrations from brasses. Mr. Bernard Sickert's article on the Whistler exhibition, though he too takes Whistler much more seriously than we believe posterity will take him, is a much more restrained and really critical one than the kind of fulsome adulation which has been usual in magazine articles lately whenever Whistler's name was mentioned. In regard to the editorial article on "The Affairs of the National Gallery" we entirely concur in the opinion expressed that a separate administration is needed for the National and for the Tate Gallery. The combination of the two under one directorate has been talked of, but the requirements for the two posts are quite distinct. For the National Gallery a degree of learning is required in regard to ancient art which would be thrown away at the Tate Gallery, where only modern pictures are dealt with; while the director of the latter needs special qualifications of a different kind. The two should really be as distinct as the Louvre and the Luxembourg.

The *Berliner Architekturwelt* contains an article on "Gottfried Semper and the New Prussian Decree with regard to Practical Training in the Industrial Arts," by Heinrich Pudor. The writer traces the revolution in technical education that has taken place in Germany of late years to Semper's influence. He says:—

"There is no doubt that we owe this new decree to the activity of Hermann Muthesius. But Muthesius studied in England, and his artistic convictions have been influenced and guided by the new movement in England. This English movement, however, was originated (a fact that is often overlooked) by the great German architect, Gottfried Semper, who was summoned to London by Prince Albert in 1851, the year of the Great International Exhibition in London, to erect an institution for the promotion of art. The South Kensington and Sydenham Museums, that are so famous to-day, were then founded, and technical training colleges were built in connexion with them. The novelty of organisation in these colleges consisted in the fact that they were no longer fitted out as schools, but as workshops and studios, thus laying stress on the practical side of technical training. In this respect Semper is the father of the modern system of technical training, which, until recently in Germany, as far as official recognition is concerned, has left much to be desired. The new decree of the Prussian Minister of Commerce is a matter for congratulation, but it should in justice be recognised that the German Semper advocated the same methods fifty-two years ago."

The illustrations in the issue include several of the new Catholic Church at Gross-Lichterfelde, by Herr Christoph Hehl, a Gothic brick edifice, in very severe style. The effect of building in with the brick piers and jambs and the interiors, with the brick piers and jambs and white plaster, is very good; the exterior is less happy. Two curious designs for fountains are given; one a bear-fountain (Bärenbrunnen) in the Leipziger-strasse, in a large decorative niche in the wall; a bronze bear stands on the top of a pilaster above the fountain, and two smaller ones are squatted on the slab below between the two basins; it is a picturesque oddity without very much point, bears having no special connexion with water. The other is a competition design for a fountain for the Steinplatz at Charlottenburg, where the water is spouted from the trunk of a life-size bronze elephant standing on a pedestal in the centre of the large basin. This is a clever design with some reason in it, since elephants

do spout water in that way. The design is by Herr August Gaul, and obtained the first prize in the competition, so it may be carried out.

The *Antiquary* includes an article, to a great extent historical, on "Bath Stone," by Mr. T. Sturge Cotterell, an inhabitant of Bath, and therefore naturally interested in its celebrated local stone. But when one cites the endurance of any stone as exhibited in ancient buildings erected with it, it has always to be remembered that the ancient builders had the first choice, and probably used up the best beds. Mr. MacMichael gives another instalment of his interesting essay on "The London Signs and their Associations." Mr. J. Russell Larkby commences an article, illustrated by a map and a section, and by numerous drawings of flints, entitled "Notes on Prehistoric Man in West Kent." The special region dealt with is that called Well Hill, west of the river Darent, and the primary idea of the work was "to ascertain how much reliance could be placed on the classification of surface implements without having recourse to the sinking of sections." The writer says that upwards of 200 implements and innumerable flakes were found by himself and by the agricultural labourers who assisted in collecting examples. We confess that we are still among those who are somewhat sceptical as to the artificial character ascribed nowadays to many flints picked up on the surface of the ground, but some of those figured among the illustrations to this article appear to justify their selection.

In *Technics*, Mr. Harold Busbridge concludes his instructive contribution on the subject of "Defects in Timber," dealing with those which develop after felling and for this reason may be classed as preventible. Side-shake, generally caused by seasoning in the log, "foxiness," resulting from the fermentation of sap in unseasoned timber, wet rot due to contact with damp earth, dry rot and "doatiness," caused by fungoid growth, and injuries arising from the attack of various insects, are the chief defects discussed and illustrated by reproductions of photographs taken in the Natural History Museum and elsewhere. The only new article in the current issue likely to be of interest to our readers is one commenced by Mr. Walter P. Adams on "Electricity from Town's Refuse." From the present brief instalment it is difficult to form an opinion as to the full scope of the writer's intention, but we presume his object, as in the paper read by him before the Institution of Electrical Engineers in December last, will be to demonstrate the economy to be derived from the combination of dust destructors and electricity works.

The *World's Work* contains an article by Mr. H. G. Archer under the title "Will it Pay to Electrify?" the question concerning, of course, the working of railways. The experiences of some short lines, such as the Mersey railway, appear to be in favour of the financial aspect of the question; there is no experience as yet in regard to lines of any magnitude. One practical point is mentioned, the lessened wear of the road from the smoother and less hammering action of an electrical engine, which has no large piston rods, connecting-rods, and cranks in rapid movement, and is consequently sturdier in its running than a steam locomotive. But for the employment of electrical power over the whole railway system of a country there are more considerations to be taken into account than either financing or smooth running. For short local lines the success of the electrical system seems to be proved; for the whole railway system of a country it still hangs in the balance.

Amid the many absurd and ill-considered efforts of what is called art-criticism that one meets with nowadays in magazines, it is refreshing to find side by side in the *Nineteenth Century* two articles on artistic subjects with which we can feel in complete sympathy; one by Sir W. Richmond on "George Frederick Watts," the other by Sir Philip Burne-Jones on "The Experiment of Impressionism." Sir W. Richmond's article is an eloquent and heart-felt tribute to Watts, and at the same time an admirable critical discrimination in regard to the special merits of various works. He sums up with the remark, Watts's art was the expression of a great mind. "High thinking and sincere workmanship, if attained, are indestructible; and even if every great canvas were destroyed, the name of a man who has made a deep impression in his time will be immortal." And that seems just.

the right way to put it. Watts was not in every respect the greatest painter of his day, but he was the painter with the loftiest aim. Sir Philip Burne-Jones's sarcastic and unanswerable piece of truth-telling about the Impressionists—mainly in reference to the recent show at the Grafton Gallery, should be read by all those foolish people who are carried away by the declarations of a clique of so-called critics to regard these painters of ugliness as the heralds of a new era in art. It is put with merciless precision, and every word of it is true.

The *Independent Review* contains an article by Mr. Laurence Binyon on "Watts and National Art." In a certain sense we think the idea of national art a delusion; since for any art to be essentially and obviously national, or characteristic of one particular nation, means really that it is somewhat restricted in its aims. Art, in modern times, is cosmopolitan, and is more-over personal to a degree to which it never was in earlier days. When, however, Mr. Binyon quotes Watts as deploring that there is nothing in English art comparable to the elevation and dignity to which English literature attained, and that English art "so little expresses the peculiar qualities of English character and history," we quite agree with him. What is wanted, however, is not that English art should develop any special qualities which may be regarded as essentially English, but that it should develop a greatness and intensity of expression comparable with that of English literature. At present English art is national—a great deal too national—in the sense that it is restricted and insular. We do not want to see it made more English, but less English. One reason of the much larger and fuller expression of art in France than in England is no doubt to be found in the great encouragement and opportunity given by the French government to monumental works of art. Similar opportunities in England would no doubt in time make a difference, but we doubt if they would raise English art to the level of English literature. The genius of this country runs more naturally into literary than artistic expression; and Watts himself fell into the snare in his later years, and produced pictures which were sermons rather than works of art. Mr. Binyon wishes to deny or explain away this charge; but it is useless in the face of some of Watts's later pictures, unless we are to "make-believe very much."

The *Monthly Review* contains an article by Mrs. Ady on Burne-Jones which is one long outpouring of adoration. On the part of a personal friend (if that was the situation) this is a natural and an amiable weakness, but it does not help the cause of true and well-balanced insight into art. Editors of magazines are also to blame for lack of judgment in these matters. When an eminent artist dies their immediate idea seems to be to get some one to write an idolising article upon him—the more idolising the better. That kind of article does not (if editors could only see it) add to the weight of their magazine with thoughtful readers. But then editors of English magazines mostly know and care little about art; they publish what they think will sell.

In *Macmillan* Mr. Lewis F. Day writes an article on "The Profession of Art." It is a sound, sensible article, in which he endeavours to draw the line between the mere "pot-boiling" view of art on the one side, and the attitude of contempt for mundane things and mundane responsibilities too often affected by one school of artists. The tendency of the article is summed up in the concluding words.

"The position of artistic superiority to practical considerations is untenable, and the sooner it is given up the better. Its abandonment involves no loss of self-respect; there is nothing very dignified in standing upon dignity."

The upshot of this argument is that allegiance to art does not absolve a man from his obligations to the community; that by earning his living (whether by his art or by a separate trade) he need in no way impair his faculty; that, though it were thereby impaired, he takes too much for granted in thinking that reason enough for shirking his responsibilities; and that, in short, artist or whatever he may be, his duty is to keep himself and pay his way. When he declines to do so he brings discredit upon the calling he would have us place so high."

In the *Cornhill* Mr. D. C. Hogarth writes an article on "The Nile Pans," a description of a waste part of the country by a man who knows Egypt well; waste land which he thinks may and probably will be brought more or less under cultivation in time.

"The agents of change, however, are abroad, and the time is not far off when the limits of cultivation will be

pushed northward as far as the southern shores of the lake. That is as far as they were pushed eighteen hundred years ago by Imperial Rome. And perhaps the time is not so much farther off when the lake itself will be cut off from the sea and its bed drained and parcelled out into arable plots, suffering the same change that in the past ten years has come over the lagoon of Aboukir and now threatens that of Edku. The severest critics of British rule in Egypt admit that at least it has resulted in certain ameliorations of the lot of the agricultural Egyptian—in his having better security of tenure and a larger enjoyment of the fruits of his labour. Nor, again, is it denied that we are improving his food and the sanitary conditions under which he has to live. We may fairly take credit, then (if credit there be), for two consequences of these ameliorations—for the steady increase in population and the obvious growth of a land-hunger among the people. The one is pushing a growing proportion of the *fellahs* out of their native villages, the other inducing the surplus to make, not for the towns, but for the unappropriated arable lands. The vacuum which sucks that surplus nowadays is the Northern Delta. There alone, in the strait and teeming valley of the Nile, is yet room and to spare; and there will be seen in the near future the greatest expansion and modification of Nature by man."

The *Century* contains reproductions from a new series of etchings by Mr. Joseph Pennell illustrating "The Skyscrapers of New York." Whatever we may think of these high buildings in an architectural and a practical sense, as city architecture, they furnish very good subjects for an artist in black and white, who can elude detail, and confine himself to effects of grouping and light and shade. These illustrations are in fact much more pictorial than architectural, and probably seem even more so here than they would in the original etchings; for we presume that these are photographic reproductions, not impressions from the etched plate. Etchings are difficult things to reproduce satisfactorily.

Harper contains an interesting paper by Mr. E. F. Baudélier, of the American Museum of Natural History, under the title "The Truth about the Inca Civilisation." Mr. Baudélier is a sceptic as to the great power and extent of the Inca rule and civilisation, and the object of his article is to destroy what he regards as a piece of legendary lore, and draw conclusions as to Inca civilisation from a fresh examination of existing monuments and relics. The article is a piece of destructive criticism, the argument of which we cannot follow out here. We may mention, as one point, that the author denies the existence of a gigantic road system made by the Incas; "roads of ancient make exist in various places, but they are not after a general plan and not connected."

In the *Gentleman's Magazine* Mr. Cuthbert Hadden goes into the question of "Subsidised Opera" (important to all who care about art in any shape), showing how almost universal is the system in continental countries of a State or Municipal subsidy to a National or Municipal Opera House, and how impossible it is to keep up opera, and how standard otherwise. But then Mr. Hadden is not thinking of mere "opera seasons," arranged by managers on terms that will pay them (terms prohibitory to a large proportion of the public), but of opera kept up all through the year as a standard form of art. He also urges that in England all operas should be given in English, as in Germany they are all given in German; but here we cannot agree with him. The right principle is that all operas should be given in the language in which they were originally composed, as it is impossible otherwise to realise the true relation between words and music; and the attempt to screw the translation into a form where there will be the same number of syllables as in the original (in order to fit the music), results almost inevitably in the most terrible maltreatment of the language from a literary and poetical point of view.

Knowledge contains an anticipatory article on the total eclipse of the sun on August 30 of this year (not total in this country), by Mr. W. Shackleton, which is to be continued in future issues. There is an interesting article and two diagrams in regard to "A New View of the Stars." The scheme of the map is to represent their distances on a plan, on which are concentric circles representing each so many light-years of distance, by way of giving a graphic diagram of proportionate distances with reference to the solar system. Mr. F. E. Heath is the author. He concludes by repeating the belief (which indeed we think may now be regarded as an established conclusion) that the stellar universe of which we have optical evidence is limited and not infinite. That has nothing to do, of course, with the question of the infinity of space, with which some persons seem to have been inclined to confuse it.

CARPENTERS' HALL LECTURES:

THE ORIGIN AND DEVELOPMENT OF THE COLLEGIATE PLAN AT OXFORD AND CAMBRIDGE.

The fourth of the present course of the Carpenters' Hall lectures was given on Thursday last week by Dr. J. Willis Clark on "The Origin and Development of the Collegiate Plan at Oxford and Cambridge."

Sir J. Gorst, M.P., presided, and, in introducing the lecturer, said the subject to be dealt with was one of extreme interest. The growth of the colleges at Oxford and Cambridge and their amalgamation into two great universities was a thing unique in the history of education. There was no other institution in the world that he knew of exactly like Oxford or Cambridge, and he supposed at the present day it would be almost impossible to form one.

Dr. J. Willis Clark said that when a stranger visited either Oxford or Cambridge and saw the university buildings and the buildings of the different colleges, he supposed nearly every one imagined that both had been constructed upon a plan preconceived from the beginning. Most visitors would probably imagine that the university was founded in a certain year which research would enable them to determine, and that each college was arranged much as they saw it at the present time by the care of its founder. Now that very natural supposition was entirely erroneous. One of the historians of Oxford University wrote: "The University of Oxford did not spring into being in any particular year or at the bidding of any particular founder; it was not established by any formal charter of incorporation. Taking its rise in a small and obscure association of teachers and learners, it developed spontaneously into a large and important body long before its existence was recognised by prince or prelate. There were certainly schools at Oxford in the reign of Henry I., but the previous history of the place does not throw much light on their origin or explain the causes of their popularity." These words might have been written about Cambridge also. When the curtain rose, so to speak, in the reign of Henry III., they found a full-fledged constitution—a chancellor, a body of masters, and scholars. How the constitution came into being and how those regent masters established themselves and attracted large bodies of students, as unaccountably they did, had not yet been discovered, and he doubted if ever it would be discovered. For these students at that distant period of time only very simple buildings were necessary. They had to remember that in those days the instruction was entirely oral. Printing had not been thought of, and all the text books were manuscripts, and probably dictated to the learners by the teachers. Consequently the only rooms wanted were what in those days were called schools, or, as they were called now, lecture-rooms. The scholars lodged where they could, and the university paid no attention to them at all. He used the term "university" in the sense that the ancients would have used it. University merely meant *universitas*—"the whole of you," and it was long after the time he spoke of that it got to mean what it now means, viz., a place where various branches of learning are studied in a peculiar way. But to return to the scholars. If they got into trouble there was a proctor who intervened, and usually was rescued them from the town authorities, and trifling matters such as homicide or even murder were passed over as daily occurrences. Life, if rough, must at any rate have been somewhat amusing. Disturbances, as might have been expected, not unfrequently occurred between the students and the townspeople, and one of the earliest documents at Cambridge was a somewhat acrimonious letter of Henry III. to the Mayor requesting him to desire his townspeople to be less extortionate in the matter of rents, and adding, "If you continue your present course we shall ourselves have to interfere in the matter." By-and-by the scholars took the matter into their own hands, and they hired large houses in various parts of the town—large enough to contain ten to thirty scholars—and got a master to act as warden, and so they lived more peaceably, and possibly at a cheaper rate than they had done previously. These houses had various names, but were generally spoken of collectively as *hospices*. They were not, however, colleges in the sense that they spoke of colleges now, for the college system did not come into being until the end of the XIIIth century. What was understood now to be a college was a range of buildings inhabited by as many students as could be

conveniently crowded into them, as much as possible being done for their comfort and convenience and possibly also for their instruction. There was a Master, Warden, or President, and a certain number of Fellows. When the college system was first started it was a device for finding a house and commons and to a certain extent an income for the teachers. The undergraduates lived away where they could, and although there were exceptions, yet it might be said that the college system was started in the main for the college teachers and not for the taught. The term "college" did not mean the buildings, but the people who inhabited them—people who were "collected" together: just as the word "convent" meant the "congregation" of monks or nuns who lived there. When, in 1264, Walter de Merton founded his college at Oxford it was founded for a Warden and twenty scholars, i.e., Fellows. The main object of it, besides providing a convenient home for teachers, was to provide a body of regular clergy who would have nothing whatever to do with the monasteries. At that time it was thought that the monasteries were becoming too grasping and were sweeping everybody into their own precincts. The system of Walter de Merton was copied at Cambridge, for the Bishop of Ely of the day, Hugh de Balsham, founded the earliest Cambridge college, that of Peterhouse in 1284. It was founded for a master and fourteen scholars or fellows, and they would see here again that the undergraduates of the period were not thought of. The question then arose as to what these early colleges did for buildings, and he might say that usually they did nothing. Walter de Merton did what was usual for a founder, which was to buy a site and then take advantage of the houses on the site and place his beneficiaries in them. If one house was not large enough he took two or three. The founder also selected his site in the neighbourhood of a parish church, in order that those in the college might follow the daily services. The founders of these early colleges were wise in not beginning by building, because the system was an entirely new one, and no one could tell whether it would be successful or not. Walter de Merton, however, who was a man of wealth, did build for his scholars, but Hugh de Balsham packed them into certain houses and left them 300 marks to build a hall, which they did. Mr. Clark proceeded to illustrate his remarks by a series of lantern slides, and first exhibited a bird's-eye view of Merton College, Oxford, taken by Loggan in 1688, which showed that the buildings were quite irregular and included a church, which was the parish church that Merton bought and enlarged. The college was entered through a modest gate, and beyond the church was a small quadrangle, which was not there, however, till a century after Merton's death. The point he wished to emphasise was that the buildings, although placed round a quadrangle, were built without regularity and seemed to have been placed there by accident. When they came to Cambridge they would find that the first attempt to find a suitable plan for a college resulted in the taking of an ordinary mediæval house and copying it. He could not go into the somewhat difficult question of the evolution of the mediæval house, but it no doubt evolved itself from the hall. The hall was the principal room, and was not merely the place where people ate, but the place in which they met, and where a good many slept, and it was probably not without intention that the early builders usually began by building a hall, because by so doing they provided their beneficiaries with a place to eat in and also a place to lecture in. The earliest college at Cambridge which provided itself with a quadrangle was Corpus Christi, which was founded by a guild of townspeople, and was little changed now from what it was. It was built between 1362 and 1377, and was merely a mediæval house enlarged. It was built close to the church of St. Benedict and was entered by an extremely modest door in the wall. On the north, east, and west sides were chambers. On the other side was the hall, with the Master's Lodge at one end and the library at the other. The buildings were extremely simple, in two floors. The roof had no parapets or battlements, and the garrets were added at a later date. These early colleges were exceedingly rough. They had a minute account of this college drawn up by the secretary of Archbishop Parker, which showed that at first the floors were of mud, the walls were not plastered, and the roof timbers were left open. Of course there were no fireplaces, the only fire

being in the common hall, and there were many instances of benefactors leaving money to supply a fire there. Peterhouse, although the first Cambridge college founded, was not the earliest in point of building. Mr. Clark showed a view of the exterior of the north wall which proved how rough and coarse the work was. Pembroke College, Cambridge, was founded in 1346 by the widow of the Earl of Pembroke, and the quadrangle might be dated about 1355. The rest of the college was probably much later in point of date. It was entered by a small and somewhat insignificant door, which, with its oriel windows over it, still existed. On the north side there was the chapel, opposite the gate of entrance the college hall, and in close proximity to that the apartments of the master. Unfortunately the hall and the south side of the quadrangle were sacrificed a few years ago to modern innovation, and it was only by looking at ancient prints that one could judge what it was like. Trinity Hall was built about the same time as Pembroke College by Bishop Bateman, who was brought up in a monastery and no doubt imparted monastic ideas into his buildings, for while there was a quadrangle like Corpus Christi, it was not entered direct from the side, but there was a subsidiary court like the outer court of a monastery. It was a curious point and perhaps not worth very much.

So far he had dealt with the college for which the mediæval house was taken as the type, but now he came to the first great innovation introduced by William of Wykeham, Bishop of Winchester, who, in 1360, founded New College, Oxford. Being a prelate of great energy and wealth, William of Wykeham had the gratification of completing his college buildings in six years and of introducing his Warden and Fellows in solemn ceremony on April 14, 1366. His was the innovation of a great and original architect. William of Wykeham was compelled to use a somewhat cramped site, which would have crippled anyone else, at a corner of the city wall. At the north side of the site, close to the city wall, he put a magnificent chapel with a great transept. Immediately west of that he placed a cloister, and on the north side of the cloister he put a lofty belfry. The college quadrangle was situated to the south of the chapel, and it was entered for the first time in collegiate architecture through a gateway specially designed for the purpose. Two sides of the quadrangle were occupied by chambers. The side opposite the gate had chambers, with the college library over them, and the hall was in quite a new position. It was a continuation of the building containing the chapel, so that the chapel had no east window. The hall was approached by a flight of stairs at the corner of the quadrangle, where there was another tower. The kitchen was at the end of the hall, and the college garden beyond that again. The Warden's lodge was over the gate of entrance, so that he could see everything going on in the court. Magdalen College, Oxford, was founded by Waynflete, another Winchester bishop, about a century after Wykeham's work. It was founded in 1473 and completed in 1479. It was much the same as Wykeham's building plus the cloister, or rather Wykeham's cloister was there, but was made use of in a different way. Waynflete used his cloister as a means of getting round the court without those using it being exposed to bad weather. The chapel was arranged like Wykeham's, with the hall immediately beyond it. Mr. Clark showed a plan of King's College as intended by Henry VI., but never built. It was a reproduction of Wykeham's plan with certain changes.

When the college system had taken root and given evidence that it was going to be permanent, they looked about at Cambridge for a design that would be generally acceptable, and they adopted the plan on which Queens' College was built. This was begun about 1448 by Margaret of Anjou, the Queen of Henry VI., and the same arrangements were to be found in nearly all the other Cambridge colleges. They were entered from the street through a gate flanked by four turrets, and on the north side was the chapel. The hall was immediately opposite to the gate of entrance, and in close proximity were the kitchen, the pantry, and the buttery. At the high table end of the hall was the master's lodge, and close to that the library. There was at this college and at others a second court, which was entered by a passage leading from the hall, and that second court was variously treated. In the case of Queens'

College it had on the west side a building, intended originally for the public use of the college. The building was called the auditorium, but had since been absorbed by the president's lodge. The north side was occupied by the president's gallery, which was one of the most beautiful things at Cambridge. The south side was intended to have been occupied by chambers, and, as a matter of fact, was so treated, but the buildings now there were entirely modern. In that college they got all that was required for collegiate life arranged in a convenient fashion. Originally there were caves, but they had been replaced by battlements.

He had now to come to the question of where this planning came from. The college arrangements at both Oxford and Cambridge were often stigmatised as monastic, but, as he had remarked in reference to Merton College, from the very beginning the college system was started to counteract the monasteries, and none of the leading features of the monasteries were copied in either the college statutes or the buildings. To show the great differences which existed in the college buildings and the monasteries Mr. Clark showed bird's-eye views and ground plans of the Benedictine monastery of St. Germain-des-Prés, near Paris, the Cistercian monastery of Cîteaux, and Fountain's Abbey, Yorkshire. In neither of these buildings were to be found the college arrangements, although Jesus College, Cambridge, which took possession of a Benedictine nunnery and altered it to serve as a college, did resemble them, but in this respect it was different from the other colleges in the University. He believed there was no doubt that the colleges took their design from the manor house, and in the plan of Haddon Hall they saw Queens' College over again, with one exception, which was that at Haddon Hall the gate of entrance was at the corner and not in the middle of one side. The arrangement of the principal court was the same. Opposite the gate of entrance was the hall, the gallery was in the same position, the apartments of the president occupied the same position as those of the Lord at Haddon, and the buildings were arranged in the same way. Oxburgh Hall, Norfolk, built in 1482, was exactly like the college building, and showed where the great gate with four turrets came from. Compton Wynyates, Warwickshire, was another instance, and Wardley Hall, Lancashire, showed what a diminutive college might have looked like when first built.

Now they came to the second great innovation, which was introduced by Dr. Caius. Dr. Caius was a celebrated physician in the days of Elizabeth, and was introduced by Shakespeare into the "Merry Wives of Windsor." He had very strong views on the subject of collegiate arrangement, based on his medical experience. He was master of Gonville Hall, and bought up land in the neighbourhood with the view of increasing the buildings of his college. He built two parallel ranges of chambers, so arranged as to form the east and west sides of a second court; and in one of his statutes this clause occurs:—"We decree that no building be constructed which shall shut in the entire south side of the college of our foundation, lest for lack of free ventilation the air should become foul, the health of our college, and still more the health of Gonville's College, should become impaired, and disease and death be thereby rendered more frequent in both." It would be seen that at this time they had a foreknowledge of the sanitary opinions of the present day. Dr. Caius was fond of the curious symbolism so dear to the age of Elizabeth, and he directed that the outer gate of his college should be called the "Gate of Humility." Thence the student passed along a straight road till he reached the "Gate of Virtue," which led into the court built by Caius. Thence the student, after three or four years, if successful, passed through the "Gate of Honour," opposite the chapel, to the schools, where the University honoured him with a degree. This arrangement of Caius, with two parallel ranges of buildings connected together by a wall, gave great satisfaction, became popular, and was copied everywhere. After the Reformation a great deal of additional accommodation was required in the colleges, and they would find in nearly all the colleges founded subsequently to this date, and in the colleges to which further accommodation was added, one or two ranges of buildings built in such a position that there was a full circulation of air. Sidney-Sussex College, founded in 1589, fifty years

after Caius College, had a rather curious arrangement, having two courts side by side. There was a curious development of Caius's principle at Peterhouse. It was the earliest college, but it never had a fourth side to the quadrangle. In 1628 it was moved to have a chapel, but that did not close the quadrangle in, but, by an ingenious device, they put the chapel in the centre of the court facing due east, and it was connected with the buildings north and south by cloisters, which were built over. This scheme was adopted at Trinity College and St. John's and New Colleges, Oxford, and in fact at both Universities it became popular.

To recapitulate for a moment. It would be seen that at first in the colleges the mediæval house was followed and taken as a proper type of what a college should be, and that this was developed and altered by Wykeham in the splendid plan he gave at New College, Oxford. The plan of Wykeham, which obtained at Oxford, was never followed at Cambridge. At Cambridge they developed the college from the manor house, and so they went on building until Dr. Caius showed them that they must in future allow sanitary considerations to have weight.

Mr. Clark next dealt with some of the details of the colleges, and showed a photograph of the great gate at Queens' College, with its four turrets, which was a feature that came from the manor houses. It first appeared in Cambridge in King's Hall, which no longer existed, in 1427. The second was at Old Court, King's, in 1441; the third at Queens', in 1448; the fourth at Christ's, in 1505; and the fifth at St. John's, in 1501. The ornamentation of the gate of St. John's commemorated the Lady Margaret, the foundress. The string-course between the first and second stages was formed of the branch of a vine bearing leaves and fruit. Two portulicuses and two roses were set amongst the foliage. Below this string-course was a band of daisies or marguerites, in allusion to the name of the foundress. These bands projected outwards in the centre of the façade, and formed a bracket for the niche containing the statue of St. John. This statue was of later date than the gate, and was not put up till the reign of Charles II., but presumably there was a statue there before. He believed the only gate with four turrets which came into use at Oxford was at Christ Church. As he had stated at first, the colleges were placed near the parish church, and did not require chapels, and the first chapel at Cambridge was at Pembroke College. College chapels, as a rule, were simple structures, containing seats for the members, and were in many cases not remarkable for any particular architectural beauty, but the roof of King's College chapel was a triumph of architecture, and was the finest thing of its kind, not only in England but in Europe. The interior fittings were almost as beautiful as the stone work. The organ screen was a splendid example of Italian work, and was the finest specimen of a screen north of the Alps. It was set up while Anne Boleyn was Queen. In sharp contrast was the chapel of Trinity College, which was begun in the reign of Queen Mary and finished in the reign of Elizabeth. It was fitted up at the beginning of the XVIIIth century by the celebrated Dr. Bentley, and although it was not in the present taste, yet it marked a period. A slide was next exhibited of the hall of Cheetham College, Manchester, as a type of a manorial hall, together with one of the hall of Peterhouse, which was built about 1304, but had been almost rebuilt under the direction of Sir G. G. Scott. The combination room at Cambridge was the common room at Oxford, and that of Peterhouse had been little altered except that it had been made comfortable according to modern ideas. With regard to the college libraries, of course every college had books, and in primitive times they were kept in a chest. They could always recognise the college library by the arrangement of the windows, which were close together. In conclusion, Mr. Clark described some of the primitive chambers, and said that although they were small and had primitive arrangements, yet they must remember that they were the forerunners of the excellent chambers in use to-day.

On the motion of the Chairman a hearty vote of thanks was passed to the lecturer.

APPOINTMENT OF SANITARY OFFICER.—The Local Government Board has sanctioned the appointment of Mr. J. C. Nicholson as a sanitary inspector in the Metropolitan Borough of Hackney.

THE ADVERTISEMENTS REGULATION BILL.

The following is the text of the Bill brought forward by the "Society for Checking the Abuses of Public Advertising," which passed the second reading in the House of Lords on Thursday, the 9th inst. The Bill has been prepared with careful regard to the experience of the last ten years, and is intended to assert the principle that there ought to reside somewhere a legal authority able to deal in specific cases, with exceptionally disfiguring developments of advertising display:—

"**CLAUSE 1.**—This Act may be cited as the "Advertisements Regulation Act, 1905."

CLAUSE 2.—Any local authority as defined by this Act may make by-laws.

(i.) For regulating, restricting, or preventing advertising by means of dazzling light, or special use of light or sound, advertising on pavements, and scattering of advertising papers.

(ii.) For limiting the height of hoardings, or preventing the use for advertising purposes of hoardings above a certain height.

(iii.) For preventing the exhibition of advertisements in such places and in such manner, or by such means as to injuriously affect the amenities of a pleasure resort, public park, promenade, or residential district, or to disfigure the natural beauty of a landscape.

(iv.) For enforcing the removal or discontinuance of advertisements exhibited in contravention of such by-laws.

(v.) For enforcing the removal within a prescribed time, not being less than a year after the by-laws come into operation, of any advertisement erected or placed before the making of the by-laws, in such a manner as would be in contravention of the by-laws, if the same had been previously made.

Under this Act by-laws may be made with respect to any class or classes of advertisements, and with respect to any particular place or places as may be specified in the by-laws.

CLAUSE 3.—Any by-laws made by a local authority under the provisions of this Act shall not be approved by the sanctioning authority unless they have been published twice in some newspaper or newspapers circulating in the district of the local authority, nor until two months after the second of such publications, and the sanctioning authority shall before approving the same consider any objections which may be made thereto by any ratepayer.

CLAUSE 4.—The power of making by-laws conferred upon local authorities by this Act shall be deemed to be in extension of the powers conferred by the following enactments, that is to say:—

(i.) As to the London County Council and other county councils in England, by the Local Government Act, 1888, section sixteen.

(ii.) As to county councils in Ireland, by the Local Government (Ireland) Act, 1898, section sixteen.

(iii.) As to county councils in Scotland, by the Local Government (Scotland) Act, 1889, section fifty-seven.

(iv.) As to Boroughs in England, by the Municipal Corporations Act, 1882, section twenty-three.

(v.) As to boroughs in Scotland, by the Burgh Police Act, 1892, section three hundred and sixteen.

(vi.) As to boroughs in Ireland, by the Municipal Corporations (Ireland) Act, 1840, section one hundred and twenty-five.

And subject to the provisions of this Act by-laws under this Act shall be made in like manner subject to the same conditions as by-laws under those enactments.

CLAUSE 5.—For the purposes of this Act the expression "local authority" means:—

(a) Within the administrative County of London, the London County Council.

(b) Within any borough in England or Ireland, the council of that borough.

(c) Within any burgh in Scotland, the council or police commissioners.

(d) Elsewhere in England, Scotland, or Ireland, the county council.

The expression "district" means the area within which the local authority has jurisdiction.

The expression "sanctioning authority" means the authority whose approval is required before the by-laws take effect.

THE "ARMocreTE" TUBULAR FLOOR SYSTEM:

DISPENSING WITH MOULDS AND FALSEWORKS.

In the construction of a concrete-steel floor of the ordinary kind it is necessary in the first place to erect falseworks comprising beam moulds and a complete wooden floor extending over the whole area to be covered. Then the steel bars forming the reinforcement have to be placed and fixed, and the floor is finished by depositing concrete in the beam moulds and over the intervening panels. This mode of construction involves the employment of considerable quantities of timber, which cannot be removed until after the concrete has set, and the quantity of material required is much increased if moulds for two or three stories are erected simultaneously for the purpose of saving delays. Practical objections, in addition to the cost of the timber, are represented by the time consumed in erecting and removing the moulds, and hindrance to the rapid execution of work.

The invention here described has for its object the construction of concrete-steel floors without falseworks of any kind, except moulds for beams of more than 25 ft. long. Although new in this country, the system has been

largely employed in Germany, and during the last twelve months some 200,000 sq. yards of flooring were laid down for various purposes in Berlin and other cities. A complete floor structure under this system consists of three different parts—the so-called "web" *a*, the "tube" *b*, and the concrete filling *c* (see Fig. 1). The webs are made in lengths, up to

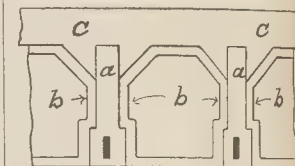


Fig. 1.

25 ft. according to span, of concrete reinforced with flat steel bars. They are manufactured in three standard sizes—6 in., 8 in., and 10 in. in depth, as shown in Fig. 2, the dimensions of the reinforcing bars being proportioned to the load and span. The tubes, made in 8-in. lengths, can be of concrete, terra-cotta, or any other light and cheap material.

When constructing a floor on the Armocrete system, the workmen first place the webs in position on their permanent supports, 9 in. apart centre to centre, and directly afterwards the tubes are dropped between the webs. Thus a strong and solid floor is at once obtained without the use of timbering, and is quite strong enough to carry the weight of the workmen who have to deposit concrete for the floor slab as well as of building materials and plant. As soon as a certain area has been laid, other workmen commence laying the concrete filling, the upper part of which forms the floor surface. The thickness of concrete above the top of the tubes varies from 2 in. to 4 in. according to the live load the floor has to carry. The result is a floor in which the reinforcement of the web takes up the tension, and the top part of the webs, together with the concrete filling, takes up the compression. The upper surface of the webs and tubes may be plastered or left rough, according to requirements. The webs can be supplied by the patentees, or manufactured by the builder on the site as may be most convenient, and being of small cross sectional area they can be handled and hoisted into position without

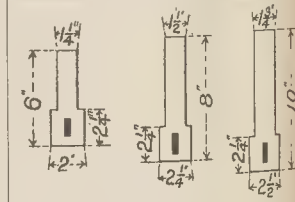


Fig. 2.

difficulty. If made of concrete, the tubes can be moulded on the site, or if of terra-cotta or stoneware they can be procured from any pottery. By altering the sectional area of the reinforcing bars, and by varying the thickness of the concrete filling, the three standard types of web illustrated in Fig. 2 can easily be adapted to any required span and load. The nearest approach to the Armocrete floor is that made under the Siegwart system, in which the floor consists of hollow beams laid side by side and connected by concrete laid on top. The chief objection to the latter form of construction is to be found in the heavy weight of the beams and the consequent expense of hoisting them to the required positions.

Compared with existing methods of ordinary concrete-steel floor construction, the advantage of the new system are obvious. As no timbering is required, considerable expense is saved, and the work can be executed with great rapidity, two men being able to lay about 40 sq. yards per day.

In many Continental cities the Armocrete floor is recognised by the authorities as being absolutely fireproof, and as strong as any other

known type. Owing to the air confined in the hollow tubes the latter afford efficient insulation against changes of temperature, and can be utilised as conduits for electric wires or for water or steam-pipes.

The system is being introduced into this country by the Armoured Construction Co., of Westminster.

THE ARCHITECTS' BENEVOLENT SOCIETY.

The annual general meeting of the subscribers and donors of the Architects' Benevolent Society was held in the rooms of the Royal Institute of British Architects at No. 9, Conduit-street, W., on Thursday last week.

In the unavoidable absence of the President, Mr. John Belcher, A.R.A., Sir Aston Webb, R.A., presided, and there was a good attendance.

The minutes were read and confirmed, and the annual report and balance-sheet were taken as read. From the annual report we take the following extracts:—

"The Council of the Architects' Benevolent Society, in submitting their fifty-fourth annual report to members, has to record a year in which possibly the existence of the Society was never more amply justified. Whatever may be the cause, the fact remains that more numerous applications for grants have been received than usual, and many of these applications have called for special sympathy and help. The Council fortunately have been able to meet the unusual demands made upon them, and have expended £850. 15s. in the payment of grants, and in the relief of deserving cases—the largest sum ever distributed by the Society in one year. It is interesting to note, as an indication of the steady progress of the work, that the sum granted to applicants ten years ago (1894) was £582. At the end of last year, however, the income account showed a deficit of 471. 9s. 1d. The Council hope that, as on a previous occasion, when the income had been exceeded, a generous donor may come forward to make good the arrears.

During the year 5392. 5s. was received in subscription, and 5882. 10s. 3d. in dividends from invested capital. The sum of 457. 14s. 2d. was also received from the inland revenue in response to a claim for the rebate of two years' income-tax.

With regard to the capital account, the Council have to report a falling-off in the donations, the sum of 275. 10s. 10d. only having been received—the smallest for many years. In addition to this sum, there was, however, a balance brought forward from the preceding year of 212. 11s. 3d., and legacies were received from the estates of the late Mr. H. Saxon Snell of 1000., and of Mr. Chester Foulham of 50. 6s. The Council were, therefore, enabled to add to the investments by the purchase of 2000. New Zealand 3 per cent. inscribed stock at a cost of 1742. 11s. The sum total of the Society's invested capital now amounts to 18,771. 8s. 2d. Notwithstanding the depreciation in recent years in the value of Consols, of which the Society holds 4,706., the total investments realised at current market prices. There is a further sum of 1812. 6s. 3d. standing to the credit of the capital account in the hands of the bankers. Members are reminded that all donations are placed to the credit of this account, and that it has been the aim of successive Councils for many years to increase the stability of the Society by adding to the amount of its investments. It is much to be regretted, therefore, that the amount received in donations last year should be so much below the average.

As the majority of cases relieved by the Society come from the provinces, the Council, with much satisfaction, note that the annual made in recent years to the Societies allied to the Royal Institute of British Architects has not met with a sympathetic response. Last year the Leeds and Yorkshire Architectural Societies (through their President, Mr. Bertram Bulmer) gave a donation of 10. 10s., and added their name to the list of annual contributors. Towards the close of the year Mr. William Glover, a past-President and general benefactor of the Northern Architectural Association, promised, through the Honorary Secretary of that Association (Mr. W. R. H. Tinsley), a donation of 500., with an expression of the wish that the Northern Association might have the privilege in perpetuity of supporting the claims of applicants coming from the counties of Northumberland and Durham. The thanks of the Society are due to Mr. William Glover for his handsome gift.

Sixty-six applicants have been assisted during the year, and ten pensioners have been paid their annual grant. One pensioner died during the year.

The Red Book was issued as usual in June, not only to members of the Society, but to every member of the Royal Institute of British Architects. The expense incurred, however, was hardly justified by the result, the number of annual subscribers being only increased by seven. In view of the comparatively small number of solicitors in active practice who contribute to the Society, the Council make an earnest appeal for more liberal support.

The Council have to record with deep regret the death of Mr. Arthur Green, Mr. Thomas Blashill, and Mr. Henry A. Hunt, all of whom took an active interest in the work of the Society. Mr. Hunt was one of the Society's auditors, and Mr. Green its largest annual subscriber.

Owing to the death of Mr. Hunt it was necessary to nominate a second auditor. Mr. Henry Lovegrove kindly undertook to fill the vacancy, and Mr. John T. Christopher audited the statement of accounts.

The following gentlemen, being the five senior members, retire by rotation from the Council:—Mr. J. J. Burnet, Mr. J. E. Christian, Mr. St. A. Roumieu, Mr. G. G. Somell, and Mr. R. A. Ormington. To fill the vacancies caused by these retirements the Council have the pleasure to announce Colonel Robert W. Edis, C.B., Mr. H. L. Poynter, Mr. G. Bertram Bulmer, Mr. F. W. Hunt, and Mr. Walter L. Spiers.

The Chairman, in moving the adoption of the Report and balance-sheet, said that, as in past years, there had been before them many sad cases during the last year, and all members of

the Council knew how urgent were the needs of the Society to meet such cases. It was the duty year by year of every occupant of that chair to tell the same sad tale, and to ask for help—a tale of sorrow and sadness which through ill-health or accident might at any time apply to those who worked with and existed by the use of their brains and hands, as architects did. One of the most useful things the Institute did was to give the Society the help it did—the use of its rooms, and in other ways. The officers of the Society carried out their work with the greatest possible care, and he had never heard that those who applied for help, who were often in a nervous and sensitive condition, and who were particularly liable to feel any slight or hurt, had ever received anything but the most sympathetic treatment at the hands of the Society. He must again mention the small amount of subscription received in comparison with the number of architects, and they must really try and increase the number of subscribers in some way. He happened to be connected with the Artists' General Benevolent Institution—which included all artists—whose income was about 4,000., and the subscriptions to the Architects' Benevolent Society compared very unfavourably with that. Only 5 or 6 per cent. of the members of the Royal Institute of British Architects subscribed to the funds, which seemed ground, might regard the subscription to the funds of the Society as in the nature of an insurance, bearing in mind what the risks of life were. The Society did not go outside the profession for help, as they desired to do what they could for themselves amongst themselves. He was glad to see that Mr. William Glover had helped the Society in the way he had, and that he had done it in his lifetime, while he could receive their thanks and gratitude, and he hoped others might follow his example. Mr. T. E. Colclutt had given a donation of 250., and he (the speaker) would be glad to follow his lead and subscribe the same amount.

The report and balance-sheet having been adopted, promises of 250. each from Mr. E. T. Hall and Mr. W. Woodward were made.

Mr. Woodward said that it might not be understood that some time ago it was made known, on the suggestion of Mr. Arthur Cates, that the Society would be glad of small subscriptions of 5s. or 10s. from architects' assistants and others.

On the motion of Mr. H. Lovegrove, seconded by Mr. Christopher, a vote of thanks was accorded to the retiring members of Council.

Mr. G. Somell then moved, and Mr. R. St. A. Roumieu seconded, and it was agreed, that the Council for the present year should be elected as follows: President, the President of the Institute; Mr. Edwin T. Hall, Mr. Lewis Solomon, Mr. Wm. Woodward, Mr. H. H. Collins, Mr. T. E. Colclutt, Mr. Rowland Plunbe, Mr. G. T. Hine, Mr. Ambrose M. Poynter, Mr. Wm. Grellier, Colonel Edis, Mr. H. L. Florence, Mr. G. B. Bulmer, Mr. F. W. Hunt, and Mr. Walter Spiers.

On the motion of Mr. Colclutt, seconded by Mr. H. H. Collins, votes of thanks were accorded to Mr. W. Hilton Nash, hon. treasurer, and Mr. Percival Currey, hon. secretary, and they were re-elected for the ensuing year.

Messrs. Nash and Currey having replied (Mr. Currey mentioning the great assistance they had received from Mr. Dircks, the assistant secretary).

Mr. M. Poynter moved, and Mr. Nash seconded, and it was agreed, that a vote of thanks be accorded to the retiring auditors, Mr. John T. Christopher and Mr. Henry Lovegrove, and that Mr. Graham C. Awdry and Mr. Sydney Perks be elected auditors for the ensuing year of office.

Mr. Collins then proposed the alteration of By-law 43, by inserting the words, "Vice-Presidents" between the words "President and Council," and other consequential alterations. The object of the alteration, he stated, was in order to be able to show some little appreciation to those who specially assisted the Society.

Mr. Currey seconded, and after discussion the motion was agreed to, but it was left to the Council to bring up a resolution on the subject at the next annual meeting.

Votes of thanks to the Institute for the use of the rooms, and to the Chairman for presiding, brought the general meeting to a close.

Immediately following, a special general meeting was held to confirm the alteration in the by-law, and the Chairman moved the

following resolution: "That the resolution moved and adopted at the annual general meeting to add the word 'Vice-Presidents' to By-law No. 43, be herewith confirmed."

This having been agreed to, the Chairman proposed, and Mr. Lovegrove seconded, that Mr. William Glover be elected a Vice-President of the Society. Mr. Glover, he said, was an enthusiastic worker in the profession, and he would be a worthy man to elect as their first Vice-President.

The motion was heartily agreed to, and the proceedings then terminated.

THE SURVEYORS' INSTITUTION.

An ordinary fortnightly meeting of the Surveyors' Institution was held on Monday at No. 12, Great George-street, Westminster, S.W., Mr. H. T. Steward, President, in the chair.

The minutes having been read and confirmed, Mr. Percival Currey, Hon. Secretary, read a list of donations to the Library and the Library Fund.

A vote of thanks having been accorded to the donors, it was announced that Mr. H. W. Dewhurst Theobald had been elected to fill the vacancy on the Council caused by the death of Mr. Thomas Blashill.

Surveyors' Reports and Certificates.

Mr. E. Morten, Barrister-at-Law, then read a paper on "Surveyors' Reports and Certificates." To realise the importance of the work done by surveyors it was only necessary, he said, to consider the enormous value of landed property in this country, and to remember how much of it becomes from time to time the subject of surveyors' reports. In non-contentious matters their valuations were generally accepted without question, and the market value of properties depended to no small extent on their methods and their judgments. It was not surprising, under such conditions, to find that Parliament, although it had not deemed it necessary to enact that surveyors should possess any statutory qualifications, had nevertheless in various Acts fully recognised the meritorious work of the profession, and had paid its members the compliment of devolving upon them important duties requiring skill and experience for their due performance. Important work carried with it a corresponding liability, and surveyors who undertook to report on properties incurred a liability to their clients which, in some instances, was a very onerous one. It was a matter, therefore, of interest to the profession that the duty owed by a surveyor to his client should be accurately defined. For this purpose recourse must be had to the decisions of our courts, and a surveyor, who would know the extent of his liabilities, must know the general principles involved in those decisions which relate to the class of work undertaken by him. The general principle applicable to all skilled labour was that a man who undertook to perform it also impliedly undertook to bring to the exercise of it a reasonable degree of care and skill, or to quote the words of Willes, J., in *Harmer v. Cornelius*, in 1858—"There is on his part an implied warranty that he is of skill reasonably competent for the task he undertakes." Whichever form of words might be adopted, the meaning was the same, and unfortunately the same element of uncertainty was to be found. There was no possible definition of the duty of a surveyor to his client which did not involve the use of the word "reasonable," or of some other word equally capable of leading to differences of opinion. Actions against surveyors for breach of this duty had been far too rare to afford any guide which would enable one to point out by reference to them what care and skill would be considered reasonable in particular cases, and it was essential for the practical application of the standard of duty to the varied circumstances of a surveyor's work, that some general principle should be found for ascertaining what care and skill should be deemed to be reasonable, according to the circumstances of any case. Some test of negligence of general application must be found which might be applied in every case, whatever its circumstances, and, as far as he was aware, there was none other than that suggested by Tindal, C. J., in 1833, in the case of *Chapman v. Walton* (10 Bing. 57), in which, after pointing out that the question whether the defendant did or did not exercise reasonable and proper care, skill, and judgment was a question of fact, he went on to say that the decision of it

appeared to rest upon this further inquiry, namely, whether other persons exercising the same profession or calling, and being men of experience and skill therein, would or would not have come to the same conclusion as the defendant. He added that that appeared to the court to be not only an unobjectionable mode, but the most satisfactory mode of determining the question, and he expressed the opinion that there was no hardship on the plaintiffs involved in this course of proceeding, as they might have called members of the same profession to give opposite evidence if the facts would have warranted it, and the jury would then have decided upon such conflicting testimony, according to the relative skill or experience of the witnesses on either side, or according to the strength of the reasons which were advanced by the witnesses in support of their respective opinions.

He (the author) was not sure that this opinion did not ignore a real difficulty in the way of plaintiffs in such cases, arising out of the natural repugnance of members of any profession to give evidence against their fellow members, and the evidence given by them in favour of such members would undoubtedly have to be received with considerable caution; but, subject to this, the test appeared to be the only practical one, and from a surveyor's point of view it should be conclusive. It entitled him, in effect, to claim to be judged by the members of his own profession, and in any case where their opinion was against him, he could hardly hope to justify the conclusions embodied in his report or certificate. It must not be forgotten, however, that such evidence was of no value unless the particular circumstances of the case in question were taken fairly and fully into consideration. In dealing with the necessity for a full and fair consideration of all the circumstances, it should be remembered that a surveyor might, and often did, undertake work which he could not properly perform without bringing to bear upon it collateral knowledge not required in the discharge of his ordinary duties. In these cases the reasonable skill required of him involved such knowledge, and he impliedly warranted that he had it, since without it he would be incompetent to do the work undertaken. Apart from the special circumstances which called for the collateral knowledge, the work might be skillfully done, but if the employer suffered owing to the want of such collateral knowledge he would have a good cause of action against the surveyor.

The duty that surveyors owe to their clients was a qualified and not an absolute duty. They did not guarantee the absolute accuracy of their reports or certificates, but only undertook that those reports and certificates should be accurate as far as the exercise of reasonable care and skill according to the circumstances would make them so, and this qualified duty, whether or not it involved the possession of collateral knowledge, arose only out of contract, so that the surveyor was not liable for any breach of it except to persons with whom he had actually contracted. There was no vague general duty upon him towards the world at large, although, in 1888, an attempt was made (and for the time succeeded) to extend the liability of a surveyor and make him responsible to persons with whom he had no contractual relations.

The author then dealt with several cases bearing on this, and, proceeding, he said that the liability was limited to damage actually suffered by the employer, owing to the breach of duty. In *Columbus Company v. Clowes* (1903), the plaintiffs employed the defendant to prepare plans for a building to be erected on a site belonging to them. The defendant neglected to measure the site, and understanding that the dimensions of it were less than they in fact were, prepared plans accordingly and had the quantities taken out. The plaintiffs paid the defendant, but were unable, for lack of funds, to erect the building, and parted with their interest in the property. They afterwards discovered that the plans and quantities were incorrect, as they did not cover the whole of the site, and brought their action for the return of the money paid, or in the alternative for damages for negligence. Justice Wright, after pointing out that the case was a somewhat singular one, and one which, as far as he could ascertain, was not exactly covered by authority, held that the plaintiffs were not entitled to the return of their money, and that it was clear that, as far as the plans were concerned, they had suffered no real damage, since they were never in a financial position to make use of the plans, and

he awarded the plaintiffs forty shillings in respect of them. For some reason, however, he gave judgment for the plaintiffs for 40*l.* in respect of the quantities. It might happen that a surveyor's position under a contract was, in some respects and for some purposes, that of a quasi-arbitrator. When this was the case the surveyor was not liable to his employer for negligence in the discharge of the duties in question. It was often difficult to ascertain what the position of the surveyor really was under contracts for works. Under such contracts he was generally the agent for the owner, but he might also undertake the duty towards both parties of holding the scales even, and deciding between them impartially as to the amount payable by the one to the other. In such cases he might be exercising functions of a judicial character, and not liable to actions for negligence in respect of what he did in the exercise of those functions. On this point the cases of *Chambers v. Goldthorpe* and *Restell v. Nye* (1901), decided together in the Court of Appeal in 1901, were worthy of consideration. In the first case the architect was suing the building owner for fees for supervising the erection of certain houses by a contractor, and the defendant alleged that he had negligently certified for a larger amount than he ought to have done. In this case, it was agreed that the question of law should be decided in the first instance, and that the question whether or not the plaintiff had been guilty of negligence should, if necessary, be referred to arbitration. In the second case, the plaintiff sued the defendant for damages for negligently checking the builder's accounts and improperly certifying, and this negligence had been proved and found as a fact at the trial. In both cases, the contracts provided for progress certificates and payments on account, and that a certificate showing the final balance due, should be conclusive evidence that the works had been completed, and that the contractor was entitled to receive payment of the final balance. The majority of the Court held that, in both cases, the architect was placed in the position of a quasi-arbitrator, and was not liable. Lord Justice Collins said:—

"What, then, is the position of an architect who, under a contract such as that here in question, has to give a certificate which is to be final and binding, not only on his employer, but also on the other party to the contract? Can he address himself to his duty in the matter of giving that certificate, free from any obligation towards that other party, or is he placed in a position in which it is his duty to exercise his judgment impartially, as between the parties to the contract? It appears to me that he is placed in the last-mentioned position. No one disputes that, for many purposes, the architect is the agent of the building owner, and would therefore be liable to an action for negligence; but it is not inconsistent with that proposition that, for some purposes, he should assume the rôle of a quasi-arbitrator, in which case, an action will not lie against him for negligence."

And A. L. Smith, M. R., gave judgment to the same effect. Romer, L. J., however, dissented from this view of the cases in the following terms:—

"Suppose a person undertakes, for reward, to value or estimate for another work about to be done for his principal by a third person; in my opinion he does not, so far as his principal is concerned, become in the position of an arbitrator in regard to his valuation or estimate, merely because he knows that his principal and the third person have, by a contract between them, agreed that, in default of dispute previously arising with regard to the matter, his valuation or estimate is to be taken as conclusive, and as determining the price to be paid by his principal for the work to be done by the third person. In such a case, in giving his valuation or estimate, he would still be acting for his principal, and, so long as he acted without fraud, he would be under no obligation or liability to the third person, and, acting as he would do for his principal, if he was guilty of negligence causing damage, would be liable to his principal in an action. I cannot bring myself to think that this view is wrong, and yet undoubtedly the contrary view must be maintained by the architect in the present case, to enable him to succeed in this appeal. I think it would be lamentable that, in cases of this kind, an employer who pays an architect for supervising work, and who has sustained damage by his negligence in the performance of the duties, for which he is paid, should have no remedy against him."

Unless the House of Lords decided otherwise, the view of the majority of the Court would continue to prevail, and surveyors, under such circumstances, would be freed from liability for negligence. The surveyor's liability was thus made to depend, not upon his contract with his employer, but on the employer's contract with a third person.

In dealing with the limitations of the liability of surveyors for negligence in the discharge of the duties undertaken by them, the effect of the Statute of Limitations must not be forgotten. The statute, in cases of the neglect of a duty arising out of the contractual relations existing between two parties, began to

run from the date of the neglect or breach of duty and not from the occurrence of actual damage. As to the responsibility of surveyors for the work done by their clerks, he had to act, more or less, on his clerk's measurements and calculations. He could not be expected to go into every small matter of detail himself, and he might recover his fees, even though it might be shown that he left such work to his subordinates. But where the surveyor adopted work done for him by others, or acts upon information derived by him from others, he took the risk. If, with their work, he adopted errors they had made in it, they become his errors, and he would not excuse himself or escape liability by showing that he was himself misled. If the work, owing to errors made by the clerks and adopted by the surveyor, was useless, the latter would not recover for it.

As the liability of a surveyor rests upon contract, so also did his claim for his fees. It had sometimes been thought, particularly in company cases where property had been vested in connexion with the formation or reconstruction of a company, that the equitable doctrine that "he who takes the benefit must bear the burden" might enable surveyors to recover their fees for work from persons who had not given instructions for it, but had afterwards taken the benefit of it. But a surveyor must look to the person who employed him for the payment of his fees, and, even where a new company made use of his report and published it in their prospectus, the company would not be liable to pay him for the work, unless they gave instructions for it.

During the last two years, an unusual number of questions of importance to surveyors had been decided in the Law Courts. Most of those to which he desired to refer had arisen in compensation cases, but, before he dealt with these, he must mention the case of *Colls v. Home and Colonial Stores, Limited* (1904), in which the House of Lords laid down the rule which must in future govern questions of interference with ancient lights. Before this decision judges had sometimes thought that the enjoyment of light for twenty years entitled the owner of a tenement to all the light enjoyed during that period, without any diminution whatever. But the House of Lords held that that was not so, and that to constitute an actionable obstruction of ancient lights, it was not enough that the light was less than before. A substantial privation of light was required sufficient to render the occupation of the tenement uncomfortable according to the ordinary notions of mankind, and (in the case of business premises) to prevent the plaintiff from carrying on his business as beneficially as before. The application of this principle to the circumstances of particular cases would often be difficult, but it was something gained to know with certainty what principle to apply, and it would, at any rate, sometimes happen that surveyors reporting on the value of land and building site would not have the fear of injured lights before them, merely because some ancient lights, though they might still have light enough, would have less when a building was erected upon the site than they had before. Also it was conceivable that the value of buildings and building sites might in some instances be diminished owing to the limitation thus imposed on the rights attached to ancient lights.

The author, having dealt in regard to land, with claims for compensation in regard to land, proceeding, said, "So many schemes are on foot now which include street widenings, that surveyors are often called upon to report on the value of foreclosures and other similar strips of land which, as a rule, are not available for buildings or, by themselves, for any other remunerative purpose, save to be sold. In an value the same thing twice over. In an ordinary case, where the land taken is capable of beneficial occupation by itself, and so has a value of its own apart from the other land sold with it, it is right and necessary to value separately the land taken and the injury to the land affected, but where the only value of the land taken is its value in connexion with the rest of the property, surveyors sometimes forget that the difference between the value of the whole and of that which is left includes the value both of the land taken and of the injury to the rest. To put a substantial value on the land taken first, and then to get at the injury to the part left by saying, for instance, that the property was worth 60*l.* a year, and will in future be worth only 50*l.* a year, and by capitalising

the difference of 10k, is to include twice over in the valuation the value of the land taken."

The principle that compensation value was value to the owner had been established for many years, and the author quoted the two cases: *Stebbing v. Metropolitan Board of Works* and *South London Railway Company v. S. Mary Woolnoth and St. Mary Woolchurch* Bay beating on the point.

In order to maintain a claim for compensation under the Lands Clauses Acts, it was essential that the claimant should have an interest in the land taken or injuriously affected, and the case of *Frank Warr & Co., Limited, v. The London County Council*, was briefly reviewed by the author. He also dealt with the case *The King v. The High Bailiff of Westminster*, in which connection he said: "Claimants in future should know that it is never too late, until verdict or award, to accept the promoters' offer, and this knowledge should sometimes enable them to avoid a worse fate."

In conclusion, he referred to the position of surveyors who are called upon to advise trustees. "The duty they owe to trustees by whom they are retained is the same that they owe to all other clients—they must use reasonable skill and care, according to the circumstances. But the circumstances are different where a trustee is concerned, for the law allows a trustee lending money upon the security of land, to shift some of his responsibility on to the shoulders of his surveyor. . . . Looking to the importance of surveyors' reports and certificates generally, and to the care and skill required in their preparation, it may safely be said that no one is fit to undertake the work who is not, in the words of the Act, just referred to, 'an able practical surveyor.'"

A vote of thanks, proposed by Mr. Howard Martin and seconded by Mr. A. Vernon, and supported by Messrs. P. E. Pilditch, W. Woodward, and E. Hudson, was accorded to the author, who briefly replied.

It was announced that the next meeting will be held on March 27, when Mr. F. Oliver Lyons will read a paper on "The Rating of Railways, and Over-taxation, and Cause and Remedy." The meeting then concluded.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring Gardens, S.W., Mr. J. Williams Benn, Chairman, presiding at the opening of the proceedings.

Election of Chairmen.—The following gentlemen were elected as Chairman, Vice-Chairman, and Deputy-Chairman respectively, i.e., Mr. E. A. Cornwall, Mr. Evan Spicer, and Colonel Probyn.

Lands.—On the recommendation of the Finance Committee, it was agreed to lend Hammersmith Borough Council £1,500, for street improvements, Mile End Old Town Guardians 2,748l. for works at their workhouse, and Westminster City Council 14,961l. for street improvements, etc.

Lewisham Palace of Varieties.—The Theatres and Music Halls Committee recommended that Messrs. Owen and Ward be informed that, provided the works shown on the eight plans submitted by them with regard to a building to be known as the Lewisham Palace of Varieties, and to be erected at the corner of High-street and Limes-grove, Lewisham, are commenced within six months, the Council will be prepared to grant a certificate to the owner of such building. The recommendation, to which conditions were attached, was agreed to.

Proposed New Theatre at the Corner of Aldwych and Drury-lane.—On the same Committee reported as follows:—

"The Council on March 29, 1904, approved plans for a theatre proposed to be erected at the corner of Aldwych and Drury-lane. Mr. J. P. Stanger submitted to us, on behalf of Mr. Stanger, a plan showing a theatre on the site. The total number of persons for whom accommodation is proposed to be provided is 1,000, and for this number the means of exit from the building are quite sufficient. The Council on March 7, 1905, on the recommendation of the Finance Committee, approved of the design submitted by the architect."

The Committee recommended accordingly, and it was agreed.

The New Building Act (Amendment) Bill.—Mr. Radford asked the Chairman of the Parliamentary Committee what was proposed in regard to the Building Act (Amendment) Bill. Dr. Napier, Chairman of the Committee,

replied that it had been agreed, by those acting for the Council and those against, that all the Bill, with the exception of the fire clauses, should be dropped, and that the fire clauses should go before the Committee.

Collapse of Electric Derrick Crane.—The Building Act Committee reported as follows:—

"Our attention has been drawn to the collapse on March 1, 1905, of an electric derrick crane used in the erection of the Waldorf Hotel and Theatre, on the west side of Aldwych, at the corner of Catherine-street, Strand. The crane, which was supported on a lofty timber gantry within the outer walls of the building, at present about 50 ft. high, and was designed to carry three tons, was being used to hoist a block of Portland stone, weighing about two tons, from a van in Catherine-street, when the base of the vertical mast was wrenched from its bed, causing the jib to fall outwards towards the street, with the result that the block of stone fell into the roadway, and the jib was broken across the top of the scaffolding, the head being only held in position by the hoisting tackle. The damage done to the building and scaffolding appears to have been slight, but one of the workmen employed on the building was injured. The accident may form the subject of legal proceedings, and we do not, therefore, think it advisable to say anything at the present time as to the probable cause. We would, however, point out that there is no provision in the London Building Act 1894, for the inspection of building plant or scaffolding by any public authority; but that Clause 173 of the London Building Acts (Amendment) Bill would, if the bill were passed, give the Council power to appoint inspectors, and to require the removal of such plant as might be likely to be a source of danger, and it is probable that such a provision would reduce the number of accidents of the kind now under consideration."

Holborn to Strand.—The following recommendation of the Improvements Committee was agreed to:—

"That, subject to the result of the usual inquiries proving satisfactory, the site between Kingsway and Kent-street, having an area of about 4,000 sq. ft., and shown by red colour on the plan (Reg. No. 17) presented to the Improvements Committee on February 22, 1905, be let to the Council on usual conditions, to Messrs. W. B. Smith & Son for a term of ninety-nine years at a ground rent of 900l. per annum; that the solicitor do complete the matter; and that the seal of the Council be affixed to any necessary documents in connexion therewith."

Housing of the Working Classes.—The Housing of the Working Classes Committee reported as follows:—

"In continuation of previous reports on the subject of the displacement of persons of the working classes in connexion with the redevelopment of private property, we desire to submit further particulars of cases which have recently been brought under our notice. In Gaubert-street, Teesdale-street, and Teesdale-yard, Bethnal-green, forty-one houses have been demolished, involving the displacement of about 270 persons, and tenement buildings with accommodation for probably a larger number of persons are being erected on the site. Sites are also being, or about to be, cleared for the erection of commercial premises in Collier-street and Collier-place, Finsbury, in Elm-street and Elm-court, Holborn, and in Camelot-street and Delphi-street, Southwark. The displacement of 25, 30 and 23 persons of the working-classes will be effected by the respective clearances. In Myrtle-street, Finsbury, and in Romford-street, Stepney, about 450 persons of the working classes either have been or are about to be displaced. The site is being re-arranged by widening Romford-street from 22½ to 30 ft., and working-class tenement buildings are being erected on the remainder of the site."

The Committee also reported that working-class dwellings containing accommodation for 31,011 persons have already been provided by the Council, and that, in addition, blocks of dwellings capable of accommodating 912 persons are almost ready for occupation. The gross rent receivable therefrom amounts approximately to 118,000l. per annum. The income from all the dwellings has hitherto been sufficient to meet all outgoings after making full provision for repairs and renewals, charging interest on capital outlay, and setting aside a sinking fund sufficient to replace the whole of the capital outlay within a period of sixty years.

The Council adjourned soon after seven o'clock.

WAR MEMORIAL BARRAS BRIDGE, NORTHUMBRIA.—The committee of the Northumberland War Memorial Fund have decided to accept the design of Mr. T. Eyre Macklin, of Newcastle, for the statue which it is proposed to erect in Barras Bridge, in memory of the men of the Northumbrian regiments who fell in the South African War. The accepted design, which was selected from forty-one other models sent in open competition, is for a monument which will stand between 60 ft. and 70 ft. high. A figure of Northumbria, over 9 ft. high, and of bronze, and a figure of Victory of the same material, 10 ft. high, are included in the design. The pedestal of Northumbrian stone is a six-sided obelisk, and there will be five bronze shields for the names of the fallen. Garlands of oak leaves join the shields together, and these, like the rest of the figures and ornamentations, will be in bronze. The cost of the memorial will amount to 2,000l. in all.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Strand.—The retention of a projecting sign over the main entrance to Lyons' Popular Café, Nos. 201 and 202, Piccadilly (Messrs. Bartlett & Gluckstein for Messrs. J. Lyons & Co., Ltd.).—Consent.

Wandsworth.—A building in front of the gardener's lodge at the entrance to the Lambeth Cemetery, Blackshaw-road, Tooting (Mr. H. C. J. Edwards for the Council of the Metropolitan Borough of Lambeth).—Consent.

Dulwich.—Buildings upon a site abutting upon the southern side of Herne-hill and eastern side of Holmdene-avenue, Dulwich (Messrs. J. Bott & Sons for Mr. J. Parr and the trustees of the late Henry Fisher).—Consent.

Lewisham.—Thirty-four houses on the south side of George-lane, Lewisham, eastward of No. 32 (Messrs. Gledhill Brothers).—Consent.

Walworth.—A two-story building at Nos. 136 and 138, New Kent-road, Walworth (Mr. C. A. Lansdown for Mr. F. W. Belleini).—Consent.

Wandsworth.—Four one-story shops on the east side of Cavendish-road, Wandsworth, abutting also upon the north side of Grove-road (Messrs. J. D. Mathews & Son for Mr. J. King).—Refused.

Width of Way and Lines of Frontage.

Holborn.—A building upon a site on the east side of Southampton-row, Holborn, abutting also upon the south side of Fishers-street and north side of Eagle-street (Messrs. Brasshaw & Gass for the Royal London Friendly Society).—Consent.

Width of Way and Space at Rear.

Kennington.—A two-story addition at the rear of stables on the west side of Bond-street, Vauxhall, to abut upon Clark's-place (Messrs. J. A. J. Woodward & Sons for Messrs. G. Howlett & Sons).—Consent.

Formation of Streets.

Walworth.—That an order be issued to Messrs. Cluttons, sanctioning the formation or laying out of new streets for carriage traffic upon the Walworth estate, to lead from Portland-street to Villa-street and South-street, Walworth (for the Ecclesiastical Commissioners).—Consent.

Hackney, North.—That the application of Mr. C. Cheston for an extension of the period within which a new street for carriage traffic to be named Leweston-place to lead from Upper Clapton-road to Portland-avenue, Hackney, was required to be clearly defined throughout by posts and rails, or so otherwise as the Council might permit, and thrown open to the public as a highway, be granted.—Agreed.

Whitechapel.—That an order be issued to Mr. A. Davis sanctioning the formation or laying out of new streets for foot traffic only upon a site on the south side of Fashion-street, Commercial-street, Whitechapel.—Consent.

Lewisham.—That an order be issued to Mr. E. Van Putten sanctioning the formation or laying out of a new street for carriage traffic to lead from Nightingale-grove to Ennersdale-road, Hither Green, Lewisham (for the Metropolitan Borough of Lewisham).—Consent.

Cubical Extent.

Woolwich.—An addition to a bakery at the premises of the Royal Arsenal Co-operative Society, Powis-street, Woolwich (Mr. F. Bethell for the Society).—Refused.

Means of Escape at the Top of High Buildings.

Westminster.—That Mr. J. S. Gibson be informed that the Council has considered the drawings submitted by him for Messrs. Holloway Brothers, London, Ltd., showing means of escape in case of fire proposed to be provided on the seventh (top), sixth, and fifth stories of a block of office buildings on the north side of Tothill-street, Westminster, eastward of the Imperial Theatre.—Consent.

St. George, Hanover-square.—That Mr. J. P. Bishop be informed that the Council has considered the drawings showing the means of escape in case of fire proposed to be provided on the seventh (top), sixth, and fifth stories of the Ritz Hotel, Piccadilly, and Arlington-street, St. George, Hanover-square, for the persons dwelling or employed therein.—Consent.

Strand.—Means of escape in case of fire proposed to be provided on the sixth (top) story of Nos. 228 and 229, Piccadilly, and 39, Haymarket (Mr. W. Woodward).—Consent.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.*

The ninth meeting of the Discussion Section took place on the 1st inst., when Mr. E. J. Stubbs read a paper upon "Flats." The following is a brief summary of some of the more noticeable points in it.

After laying down the principles which generally govern the planning and carrying out of schemes for flats, the speaker went on to enumerate the points that must be attended to if a successful treatment of the building is to result. Preliminary investigation was most important, and the success of a client's investment is a very great measure depended upon the accuracy of the judgment displayed. Overcrowding the site must be avoided, and no hesitation in setting back the building line should arise if necessity demanded an area in front of your ground-floor windows. As regarded arrangement, the greater the number of flats on each story that could be served by one staircase or lift the more economically could the building be erected and administered. Each flat should have a frontage to a street, and back flats were only justified if they overlooked a large open space. In the case of cheap land in the suburbs he was convinced that buildings of more than four stories in height above the pavement were unprofitable. Regarding accommodation, the plan of the first floor practically decided the plan of all the other floors. He had found it almost impossible to prevent sound passing through the floors. As a guide to the accommodation expected for varying rentals, he had found the following was what generally obtained:—150*l.*, at least six rooms; 200*l.*, seven rooms; 300*l.*, eight rooms. Coal-cellars should be placed outside the building, as tending to convenience and immunity from disturbance by noise in delivery. Likewise the boiler and furnace for heating flats should be outside, with the flue or shaft built against the outside of the building. Entrance ways into the various flats should be made as wide as possible, for convenience in moving in furniture. All water-closets should have lockers to disconnect them from passages, and no water-closet should be placed in a bathroom. Decorations and finishings should be of as permanent a character as possible, to avoid constant expense in renewals. No materials except such as can be easily cleaned should be used in the public portions, and the paving of sculleries, water-closets, and bathrooms should be of impervious materials.

The discussion was opened by Mr. W. Trant Brown, who proposed a vote of thanks, which was seconded by Mr. R. H. Weymouth and supported by Messrs. E. W. M. Wonnacott, L. Ambler, and the Chairman (Mr. H. Gregory Collins). Referring to Mr. Stubbs's remarks as to the impossibility of preventing the passage of sound through a building, one speaker thought the provision of double windows greatly helped matters, and another that systematic pugging of floors and partitions and the avoidance of the thin patent partitions in use in some buildings were also very conducive to the non-carrying of sound. The possibility of arranging rooms on more than one floor in a flat was hazarded as a suggestion, and it was understood that this had been tried in some flats near the Albert Hall, but not very satisfactorily. As to the question of maintenance of a building of this kind, Mr. Stubbs, in his reply, stated that no scale could be laid down, each building having to be considered on its individual merits.

A practical suggestion was that of the provision of a shaft or shafts to take the various pipes, such as drain (if allowed by the authorities), water, gas, etc., with access at various levels and points. Practical unanimity existed as to the desirability of providing more cupboards and storage-room than was usually done, but the question of the administration of the storage gave rise to a difference of opinion. An enhanced probability of securing a tenant was likely if repetition of plan were avoided. The provision of a common hot-water supply was queried by one speaker, but Mr. Stubbs, in replying later, said his experience of this was not satisfactory. With reference to electric wiring, it was very desirable that no two or more flats should be on one common lead, as in the event of a wire fusing all the flats might be plunged in darkness. Mr. Stubbs pointed out that it was desirable that the wiring of a flat

should not be carried through another, as in the necessity of repairs it gave rise to inconvenience. Replying to the objection on one speaker's part to back stairs, it was pointed out by another speaker that a secondary means of escape in a fire was an absolute necessity. The provision of a fly-wheel lift added greatly, in one speaker's opinion, to the ease in working a flat.

As differing from Mr. Stubbs, a speaker thought that an insurmountable objection to the provision of an electric motor above a lift lay in the tremendous vibration set up and the impossibility of preventing this unless it were placed in a sub-basement. The provision of a lift in the well-hole of a staircase was generally decried, as it tended to act as a powerful flue in case of fire, and even if the brick walling were replaced by open metal protection this was still in some measure the case. A novel idea which it was understood had been successfully employed was the provision of a movable fire-place in the main hall, this space in the summer being given up to writing-tables or lounges.

Mr. Stubbs, in replying later to this, said that he preferred the close form of stoves for halls, as they maintained the heat during the night, and in answer to another speaker he said that there was no hard-and-fast rule for estimating the cost of flats. Anything from 9*d.* to 1*s.* per foot cube might be taken, except in the cottage type of flat, which worked out cheaper.

TRIBUNAL OF APPEAL CASE: DISPUTE OVER A HACKNEY FOOTWAY.

The Tribunal of Appeal, under the London Building Act, sat at the Surveyors' Institution, on Friday, to hear an appeal by Messrs. Stones, Morris, & Stone, on behalf of Mr. Charles Winkley, under sections 19 and 44 of the Act, against the order of the London County Council, dated January 31, refusing to sanction the erection of buildings on sites abutting upon the east and west sides of Priory-place, Well-street, Hackney, and the widening of a portion of Priory-place.

The members of the Tribunal present were Messrs. J. W. Penfold (Chairman), E. A. Grüning, and A. A. Hudson.

Mr. Cunningham Glen appeared on behalf of the appellants, and Mr. Andrews, from the Solicitors' Department of the London County Council, for the respondents.

Mr. Glen pointed out that Priory-place led out of Well-street, Hackney, and was a private approach, with a public right of way to Eaton-place, and certain lands at the rear. The paved footway had been in existence for many years, and, originally, the gardens of the houses fronting thereon came up flush with the footway. In December last Mr. Winkley, having in view certain improvements, submitted plans to the Building Act Committee of the London County Council. These provided for the widening of the footway between Priory-place and Eaton-place to 20 ft. for the greater part of the length. As a matter of fact, one part could not be widened to this extent. Coupled with this proposal was one to pull down certain walls, and to erect buildings on the site. In its notice of refusal to sanction the application, the Council stated that it was not satisfied that Priory-place was a street for foot traffic only. Counsel was, however, prepared to show that the footway had been used as an approach to a stable for a considerable time. The Council also objected to any modification or relaxation of Part V. of the Act, but, on the evidence he should call, there was, he contended, no justification for refusal on these grounds.

Mr. Andrews said the position taken up by the Council was this:—That Priory-place was not an "existing street," and that, in regard to Part V., the space required—10 ft.—by the Act was not provided. A portion of the rear of the last addition was less than 10 ft. from the edge of the footway, and there remained only 40 ft. for the whole of those houses. The Council, on general grounds, objected to the scheme because it was felt that there was an intention to crowd the land with dwellings—a slum, in fact.

Mr. Glen repeated his assurance that Priory-place was a private street for foot traffic only, and pointed out that, under the plans submitted by the appellants, ample air space was provided. He then called evidence.

Two tenants in Eaton-place and Well-street spoke to using the footway for thirty-five years. One of the witnesses, however, admitted, in cross-examination, that he was a cabman, and was out the greater part of his time, and had not a very good knowledge of the kind of traffic actually using the passage in question. Mr. Winkley, the appellant, also gave evidence. He explained that it was his intention to erect on one side of the footway five

cottages as single tenement dwellings, and on the other six double tenement dwellings. It was not his intention to convert the footway for carriage traffic.

After sitting for several hours, the Tribunal adjourned the further hearing.

Fifty Years Ago.

TELEGRAPHIC PROGRESS.—TELEGRAPHIC WITHOUT WIRES!—Among the most startling wonders of this wonder-working age, is the announcement that M. Bonelli, of Turin, has invented a new electric or magnetic telegraph, by which trains in motion on a railway are enabled to communicate with each other at all rates of velocity, and, at the same time, with the telegraphic stations on the line, while the latter are simultaneously able to communicate with the trains; and it is added that M. Bonelli is in possession of a system of telegraphic communication by which wires are entirely dispensed with. The idea, however, is not new; we have repeatedly alluded to its possibility; but like multitudes of such ideas the suggestion drops into oblivion and reappears after a while as a fresh novelty. Who was its real originator we do not know, but the nearest approximation to its practical realisation we remember anything of was the mode by which a Dundee gentleman transmitted messages across rivers and straits without any intervening or subaqueous wire. Still wires were necessary, and a good long coil too, at either extremity of the space telegraphed through.—*The Builder*, March 17, 1855.

Illustrations.

A WORKING DRAWING.

THIS illustration is a reproduction of one of the working drawings employed in the erection of these buildings, forming No. 33, Dorset-street, and shows all the details of the construction and finishings of those parts having direct connexion with the frontage to Dorset-street.

This drawing may be taken as a fair example of the amount of information it is necessary to convey to the various trades employed in erecting town houses in London, as it will be seen that it deals not only with the steel construction, which is a part of almost all buildings of considerable size, and more especially those which are devoted to shop purposes necessitating girders to carry the upper part of the structure over large spans, but also deals with such matters as pavement and stallboard light, and the more artistic details required in stone work and joinery.

The various materials employed are clearly marked on the drawing, and this, I think, helps the builder, as it obviates reference to the specification and tends to prevent mistakes.

JAMES S. GIBSON.

ENTRANCE, 42, GREAT PORTLAND STREET, W.

The terra-cotta details of the alterations and additions to these premises were executed by the Burnantofts works of the Leeds Pottery Company in dull glazed ware, with coloured portions in the frieze and figure panels.

The roundels representing the chase, harvest, and the vineyard, and the figure of Plenty in the column, shown to a larger scale, were modelled by Mr. F. E. Schenck.

The general contractors were Messrs. Haywood & Son, of 320, Regent-street, and the architect was Professor Beresford Pile.

OAK CHIMNEYPIECE, HULL.

THIS elaborately-carved oak mantelpiece is one of the chief features of the ancient "Plotting Parlour" at the White Hart Inn, Hull, which was erected about the year 1550. The room, with its wainscoted walls, is almost black by reason of their antiquity, known as the "Plotting Parlour" owing to the fact that it was here that a council of war was presided over by Sir John Rotham, then military governor of the city, deputed to receive admittance to King Charles I. and the Royalists into Hull, which was then one of the best fortified places in the kingdom.

ARTHUR F. WICKENFORD.

* Report postponed from last week.

ARCHITECTURAL SOCIETIES.

LEIDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—At the rooms of this Society on Thursday, the 9th inst., Mr. E. C. Skill read a paper on "Architectural Photography." Mr. G. B. Bulmer, President, in the chair. The lecture opened with a brief sketch of the early struggles of the pioneers in the science of photography, commencing at the early stage when experiments and discoveries were made by Scheele in 1777 with the action of light on silver compounds, followed twenty years later by a further application of these primitive discoveries by Messrs. Wedgwood & Davy, who obtained pictures of objects they wished to copy by throwing the shadow upon paper impregnated with the silver salts, thereby producing a white image upon a dark ground. The work of Daguerre and Niepce was mentioned, also the discoveries and patents taken out by Mr. Fox Talbot for his photo-lithographic process work, etc., an illustration from one of his original results being shown. Mention was made of the discoveries and experiments with bichromate of potash, and of the carbon printing process patented by Pontevin in 1855. After comparing this later process with one of the latest in use at the present time, the lecturer dealt with the subject of the evening, and proceeded to give a rough illustration, with description, of the camera best suited for architectural purposes. While not altogether condemning, he disapproved the hand camera as being unsuitable for this class of work. Suggestions were made as to the most suitable form of lens to be chosen, and the names of some of the most noted makers, both English and foreign, were given. The choice of time and proper illumination for buildings to be photographed was dealt with, the lecturer remarking that very often what might have been good pictures were spoiled for want of a little care in this direction, especially for beginners. Slides illustrating this were shown. The choice of plates was next considered, and comparisons made between backed and unbacked ones, followed by a diagram illustrating the cause of halation, which was described, and succeeded by examples of photos showing comparison between both kinds of plates. The orthochromatic plates and screen were next described by the aid of a diagram showing the action of a screen when interposed between the lens and plate. On this the two extreme rays of light—viz., violet and red—were delineated, and some idea of the controlling power of the screen upon the undulations of the violet ray was thus given. Two slides of exposures made through a set of coloured glasses in conjunction with white followed, firstly on an ordinary plate, and other exposures on orthochromatic plates in conjunction with different screens were shown, after which some flower studies and views taken under similar conditions were exhibited, illustrating the effect of colour under different treatment. Architectural work was then returned to, and a number of slides shown, with notes on the arrangement of perspective and the conditions under which operations frequently had to be carried out, also the best method of lighting or choosing light for subjects in relief. The lecturer made a few further remarks on the help of photography to the architectural student, and its use in making valuable records of ancient buildings, etc.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The ordinary monthly meeting of this Society was held on the 9th inst. in the lecture hall of the Literary and Philosophical Society, Leopold-street, Mr. T. Winder presiding, when a lecture was given by Mr. A. E. Tunell on "The Bacterial Treatment of House Drainage." The purification of the sewage of isolated dwellings, he said, had always been a difficult problem for architects, for up to a few years ago the different chemical, mechanical, and electrical processes of purification were giving more or less unsatisfactory results. The sewage, after treatment, must be clear and free from turbidity, must not form flocculent deposits in the bed of the stream into which it was turned, and must be free from solid organic matter or pathogenic bacteria. It was unwise to dogmatise, but it would appear as if this result were rendered possible by the process of biological purification. It had long been known that the complex elements of which organic bodies were built were broken down and reduced by decomposition to their simpler forms, but it had only comparatively recently been realised that this change was brought about by the

agency of the organisms present in these bodies, whose number and activity were increased by some alterations in the physical conditions by which they were surrounded. Sewage was an ideal nidus for bacteria, but it was a breeding place only, for, as far as they were at present aware, there was no such thing as spontaneous generation among these organisms, as they were all normally present in other spheres and under less favourable conditions before they were mixed up with or became part of the sewage. The satisfactory purification of small quantities of sewage was now an accomplished fact; this result had been brought about without the aid of filtration, chemical or mechanical processes, but by the cleansing agency of those organisms with which Nature completed and perfected the scheme of life. Roughly speaking, these micro organisms were divided into two classes, the anaerobic bacteria, which were most active in the absence of air, and the aerobic bacteria, which flourished best in the presence of air. The former broke down and liquefied complex organic compounds, the latter built up assimilable compounds and further oxygenated and purified the sewage. At the present time there were from ten to twelve recognised processes for the biological purification of sewage, which were only variations of the principle of cultivating the different species of bacteria present in the sewage itself. These processes were open and closed septic tank with single and double contact beds, open and closed septic tank followed by continuous filtration, and single and double contact beds alone. The septic tank, or, more properly speaking, the cultivation tank, was the old cesspool slightly improved and dignified with a high-sounding name. This tank was the home of the anaerobes, which broke down, made soluble, and liquefied the organic compounds present in the sewage. The cultivation bed was the home of the aerobes, whose chief functions were those of oxidation and nitrification, and the solids in suspension in the sewage after treatment on this bed almost disappeared. A cultivation tank and bed could be built at very small cost, and sewage treated by this method might be turned on the land or into a stream without fear of further putrefaction or of causing a nuisance to adjoining estates.—On the motion of Mr. J. B. Mitchell-Withers, seconded by Mr. H. L. Paterson, and supported by Dr. Scourfield (Medical Officer of Health), Messrs. W. J. Hale, E. M. Gibbs, and W. C. Fenton, a hearty vote of thanks was accorded the lecturer. Messrs. C. Gibson and W. Potts were elected auditors of the society.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—At the tenth general meeting of the session, held on Friday, March 3, the President, Mr. Thomas Cooper, in the chair, Mr. Arthur Bolton gave a paper on "Ingram House," a residential club for young men in the south of London. Mr. Bolton set forth in detail the various points he had endeavoured to attain in planning the building, and illustrated his paper by exhibiting many of the most important drawings in connexion with the work. At the conclusion of the meeting, Mr. Bateman suggested that the Association should visit Ingram House, and arrangements are now being made with that object.—A special general meeting of the session was held at the rooms, Norwich Union Chambers, on Friday, the 10th inst., the President, Mr. Thomas Cooper, in the chair. Mr. W. S. Cross and Mr. George Hubbard read papers on "The Statutory Qualification of Architects." Mr. J. L. Ball, the Vice-President, opened the discussion, and spoke in support of the lecturers, while Mr. C. E. Bateman proposed as an amendment that registration was inadvisable. Finally the following resolution was carried, viz., that—"The Birmingham Architectural Association having listened with great interest to the addresses of Messrs. Cross and Hubbard upon the subject of 'The Statutory Qualification of Architects,' hereby records its approval of the general principle they advocate, and wishes them every success in their endeavours to bring about, through the most appropriate channels, suitable legislation upon the subject."

ABERDEEN SOCIETY OF ARCHITECTS.—The annual general meeting of this Society was held recently in the Grand Hotel. The Society's form of general conditions of contract was under consideration, with reference to a proposal on the part of the Master Builders' Federation to modify slightly the terms of the clause relating to the subject of arbitration. On the recommendation of the council, the suggested alteration was, after some discussion, agreed to,

satisfaction being expressed that, as the result of the concession, complete agreement now existed between the Society and the general body of contractors in Aberdeen in regard to the matter. The annual report of the council dealing with the affairs of the Society during the past year having been read to the meeting and approved, the election of office-bearers and council for the ensuing year was then proceeded with, the result of the election being as follows:—President, Mr. R. G. Wilson; vice-president, Mr. John Rust; hon. treasurer, Mr. William Kelly; hon. secretary, Mr. A. H. L. Mackinnon; council—Messrs. Arthur Clyne (past-president), A. Marshall Mackenzie, H. MacLennan, G. Bennett Mitchell, and James B. Nicol. On the motion of Mr. Wilson, seconded by Mr. George Watt, and supported by several other members present, a cordial vote of thanks was awarded to Mr. Clyne for the manner in which the affairs of the Society had been conducted by him during his five years' tenure of office as President. Mr. Clyne replied, and the proceedings terminated.

NORTHERN ARCHITECTURAL ASSOCIATION.—The annual meeting of the Northern Architectural Association was held in the Y.M.C.A. Buildings, Newcastle, on the 7th inst. Mr. J. Walton Taylor, President, occupied the chair. The Council in their annual report recorded the increased success of the Association. During the session, and since the last annual report, nine members, ten associates, and thirteen students had been elected, the roll now standing as follows:—Members, seventy-eight; associates, seventy-three; students, seventy; total, 221. Excepting Manchester, the Northern Architectural Association had now more members and associates of the Royal Institute of British Architects on its roll of membership than any other allied society in or out of the kingdom. The report then went on to give in detail the doings of the Association during the year. The Library report, the Students' Sketching Club's report, and the report of the West Hartlepool Branch, each of which were of a satisfactory character, were also submitted. The financial statement for the year showed the total receipts to have been 250l. 5s. 8d., and the expenditure 121l. 3s. 1d., leaving a balance of 129l. 2s. 7d. The receipts for the Permanent Premises Fund up to date amounted to 1,132l. 5s. 8d., exclusive of promises. The report and the balance sheets were adopted. The following new members were elected:—Mr. N. Vaux; associate, Mr. D. A. Adam; students, Mr. J. A. Bruce, Mr. G. E. Hunter, and Mr. R. A. O'Reilly. A Standing Advisory Committee to the Council on questions of professional practice, consisting of past-presidents and others, were appointed as follows:—Messrs. J. T. Cackett, F. E. Caws, A. M. Dunn, W. Glover, G. H. Hoskins, J. H. Morton, J. Oswald, F. W. Rich, J. W. Taylor, the Vice-President, the Hon. Secretary, the Hon. Treasurer, and the Hon. Librarian. The President then presented to Messrs. H. M. Spence, North Shields, and H. L. Hicks, Newcastle, the prizes given by the Northern Association for the best testimonies of study prepared for the Royal Institute of British Architects' examinations. The following officers were elected:—President, Mr. J. T. Cackett; Vice-President, Mr. G. T. Brown; Hon. Secretary, Mr. A. B. Plummer; Hon. Treasurer, Mr. R. Burns Dick; Hon. Librarian, Mr. H. C. Charlewood; Hon. Auditors, Ald. Winter, Mr. T. Reay, and Mr. J. Hill; council, Messrs. H. G. Badenoch, J. Bruce, F. E. Caws, J. W. Dyson, C. S. Errington, J. Oswald, and F. W. Rich (members); and Messrs. J. W. Boyd, M. G. Martinson, A. K. Tasker, R. P. S. Twizell, and H. A. Wilson (associates). The retiring President invested Mr. Cackett with the chain of office, and the new president briefly returned thanks. A vote of thanks was accorded Mr. Taylor for the excellent manner in which he had acted as President. After the annual meeting a discussion on the "Statutory Qualification of Architects" took place. It was opened by Mr. G. Hubbard, F.S.A., a member of the Royal Institute of British Architects' Council, who, in the course of his remarks, said the necessity for a Bill, having for its object the statutory qualification of architects, would in time become apparent to all in London who had the interests of the profession at heart. Although the allied societies had made up their minds on the matter the London men had remained apathetic. It must have been apparent that the profession was constantly being recruited from the untrained, and it was essential that steps should be taken to

protect architects. This could only be done by compelling those who aspired to practice to prove their qualification before being allowed to do so. A Bill had been drafted by a sub-committee for the purpose of safeguarding the profession. The Bill did not contemplate that every employer should engage the services only of registered architects. The employer would be at liberty to engage anyone he chose; but what the Bill would insist upon would be that the non-registered practitioner should not be at liberty to call himself an architect, legally claim fees as such, or issue legally valid certificates.—Mr. A. W. S. Cross, M.A., also of the Royal Institute of British Architects Council, followed.—After some discussion the meeting expressed itself in favour of the proposals put forward in the Bill.

EDINBURGH ARCHITECTURAL ASSOCIATION.—At a meeting of the Edinburgh Architectural Association, held in the Association rooms, 117, George-street, on the 8th inst., Mr. J. T. Baillie, Vice-President, in the chair, Mr. Hippolyte J. Blanc, R.S.A., read a paper on "The Arts of the Monastery." Mr. Blanc, after sketching briefly the genesis of the monastery from the original hermit cell, dealt at some length with the arts fostered in the monastery. With the aid of a lantern he showed nearly sixty slides.

CARDIFF, SOUTH WALES AND MONMOUTHSHIRE ARCHITECTS' SOCIETY.—The Cardiff, South Wales, and Monmouthshire Architects' Society held their annual dinner at the Royal Hotel, Cardiff, on Tuesday evening, when the President (Mr. C. James) presided. Amongst those present were the Mayor of Cardiff, the Deputy-Mayor, Mr. John Belcher, A.R.A. (President R.I.B.A.), Colonel E. M. Bruce-Vaughan, Colonel A. P. James, Principal Griffiths, Dr. C. T. Vachell, Messrs. E. W. M. Corbett, D. T. Alexander, Lewis Morgan, Harry Cousins, E. Seward, John Gibson, E. Franklin Thomas, Geo. Thomas, John H. Phillips, David Morgan, W. J. Locke (secretary R.I.B.A.), and E. G. C. Down (hon. secretary of the Society). After the loyal toasts, Colonel Bruce-Vaughan proposed the toast of "Our Legislators and Defenders." Mr. John Sankey and Colonel James responded.—Mr. Seward, in proposing "The Royal Institute of British Architects," said Parliament had never touched anything connected with architecture without making a failure of it. Very few members of Parliament could keep themselves *au fait* with subjects connected with art while engrossed in the social and Imperial problems which they had to consider. Mr. John Belcher responded, saying that the collective wisdom and experience of the Institute were always placed at the service of all members of the profession, whether inside or outside its ranks. He then presented a gold badge of office to the President of the Cardiff and South Wales Society, wishing the Society every success, and offering Mr. C. James his heartiest congratulations.—Mr. C. James responded. He said they in South Wales, as in other centres, had grievances against public bodies. Certain works had to be done by those bodies, and should be put in the hands of competent architects. Competent architects should be paid a recognised fee. He asked them to drink the health of the donors of the gold badge, Lord Windsor, Lord Tredegar, and Sir W. T. Lewis, and the toasts having been honoured, he presented Mr. Belcher with a jewel as a memento of the occasion.—Mr. E. W. M. Corbett proposed "The Local Governing and Educational Bodies." Speaking as an architect, he considered that England and Wales were indebted to Cardiff for their grand scheme in Cathays Park. There was nothing like it in any town in the country except London.—The Mayor, in responding, said many eminent authorities had referred to the splendid monuments of architecture in the town. They in Cardiff were now passing through a crisis in their endeavour to obtain for the borough the location of two great national institutions, and the recognition of it as the metropolis of Wales. They were, therefore, deeply indebted to the sister town of Newport, whose Council had that morning unanimously decided to present a petition in favour of the location of the National Museum and Library at Cardiff.—Principal Griffiths and Mr. Lewis Morgan also responded. Other toasts were "The Master Builders," and "The Visitors."—Meetings of architects have been held this week at Cardiff, at the invitation of the Society. The first conference took place at the Society's rooms, High-street, when papers were

read by Mr. G. Hubbard, F.S.A., and Mr. A. W. S. Cross, F.S.A., on the registration of architects, followed by a discussion in which Messrs. Corbett, Seward, Morgan, Birkenhead, and the Chairman (Mr. C. James) were the leading speakers. The architects also visited some of the most important Cardiff buildings.

BOOKS RECEIVED.

RECORD OF THE BRITISH FIRE PREVENTION COMMITTEE'S SPECIAL COMMISSION. (Published by the British Fire Prevention Committee. 6s.)

THE HOME MECHANIC. By John Wright. (John Murray. 6s.)

ELEMENTS OF MECHANICS.—By Mansfield Merriman. (Chapman & Hall.)

THE ST. LOUIS EXHIBITION, 1904.—By H. Phillips Fletcher, F.R.I.B.A. (B. T. Batsford. 5s.)

AN EPITOME OF THE LAW RELATING TO EASEMENTS. By T. T. Blyth. (Sweet & Maxwell.)

Correspondence.

OLD MINIATURISTS AND THEIR METHODS.

SIR,—A recent notice in the *Builder* of a small exhibition of old miniatures at Messrs. Dowdells Galleries is of interest to students of the so far incomparable works of the great miniaturists of the late XVIIIth and early XIXth centuries. It seems to bring confirmation of an irresistible theory, for which evidence has been sought, that the study of single eyes by these artists was not mere caprice of fashion or absurdity.

There was a deliberate opinion of an oculist, very eminent in his profession, expressed some years ago, after examination, under high magnifying power, of an incomparable example of portrait miniature (it was one ascribed to Andrew Plimer) that such a study of a human eye within the size of pin-head was a marvel of human achievement, and but possible under high magnifying power, and reduced from a careful life-size study.

This is borne out for the student of a number of master miniatures. The theory is irresistible to him that in this concentration of minute study, with a certain trick of imparted brilliancy, lies the secret of that lost expression of vivacity and humanity which it is the despair of the modern revivalist to attain, and before which the modern photographic portrait is vacuous by comparison.

These single-eye studies would be then rather practical stock-in-hand of the miniaturist than a fancy conceded to capricious patrons. It is known that the fashionable miniaturist did not often give to his lady sitter true representations of her own eyes, but flattered with conventional ideal eyes. Such persuaded, I believe, the portraits of Engleheart, who gave to his sitters a type of unnaturally great languorous eyes which, Dr. Williamson has recorded, were derived from studies of the remarkable eyes of his own daughters.

THOMAS DREW, P.R.H.A.

CHEAP COTTAGES EXHIBITION.

SIR,—May I, through your columns, remind those who are interested that the last date for sending in designs for cottages to be built at this exhibition is March 25?

It will interest many of your readers to know that the applications up to the present make us confident that the exhibition will be a success. The financial support, too, has been readily and generously given. About 3500 have been received, of which we are able to allocate a large proportion to the prize fund. But, though the expenses of organisation are kept as low as possible, we need more subscriptions if the prizes are to be as numerous and substantial as we wish them to be.

347, Birkbeck Bank-chambers,
Holborn, W.C.

MEMORIAL PULPIT, LLANDREW, NEAR BRECON.—The dedication of a pulpit, which has been erected in Llandrew Church, in memory of Giraldu Cambrensis, who was Archdeacon of Brecon from 1175 to 1203, took place recently. The pulpit was designed and executed by Mr. Robert Clarke, Hereford. It is of carved oak and in character with the late XIVth century work of the chancel seats. It is erected under the tower, and consists of three bays, with carved tracery panels containing shields.

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE. STEEL.—XI.

L'EGLISE DE ST. JEAN DE MONTMARTRE (Continued).

Fig. 77. Commencing to consider some of the more important structural details of this church, we may first call attention to Fig. 77, which is a typical section of the cylinder of reinforced concrete with its filling of rammed earth, part of a column resting upon the base-plate of cement-steel and held firmly in position by a filling of concrete, and a small portion of the floor system of the crypt.

Fig. 78. This is the cross-section of a column 44 centimetres square. The outer portion is built up of six bricks each measuring 22 centimetres long by 11 centimetres wide by 7 centimetres thick, and perforated by eight square holes. The central core consists of ordinary concrete. Except at the four corners, the vertical reinforcement consists of steel wire, No. 20 French wire gauge, measuring 4.4 millimetres diameter, the wires passing through the holes, which are afterwards filled in with concrete. At each corner of the column the vertical reinforcement consists of a steel bar with an area equal to 48 of the No. 20 gauge wires, and it will be observed that each of these bars practically fill the square hole in the brick. In the horizontal joints of the brickwork steel wires, also of 4.4 millimetres diameter, are woven in and out of the vertical reinforcement as represented in the section, and at intervals of 70 centimetres, measured vertically, diagonal ties cross from corner to corner of the column, being securely connected to the vertical bars of the reinforcement. The bricks in alternate courses are disposed so as to break joint, and when the nature of the reinforcement is also taken into account it is evident that the column is very adequately bonded.

Fig. 79. This is a cross-section of a column in the crypt, showing the projecting ribs. The diagonal square drawn in dotted lines is the outline of the column in the church above.

Fig. 80. This is taken from a cross-section of the building, and illustrates a portion of the column and floor construction. In this drawing will be seen the curved ribs springing from the columns and affording rigid support for the church floor. The portions of the upper columns appear to be wider than those in the crypt, this being, of course, because they are placed at a different angle, as explained in Art. X. and as represented by dotted lines in Fig. 79. **Fig. 81** is a plan including four columns, and the curved ribs springing therefrom.

The twisting of the columns at the floor level of the church is made practicable by the arrangement of the vertical reinforcement, in the manner described below, so as to afford support for the overhanging corners of the upper portion of each column. In the diagrammatic plan Fig. 83, let a, a', a'', a''', a'''' represent the four sides of the cross section of a column in the crypt, and b, b', b'', b''' the four sides of its continuation in the church above. Then we have four projecting corners requiring support, namely, b, b', b'', b''' . This condition is fulfilled as shown in the perspective diagram Fig. 82, where a, a', a'', a''' are the corner bars corresponding with those in Fig. 78. For the sake of clearness no account is taken in the diagram of any but the four corner bars of the vertical reinforcement. The projecting corner b of the upper part of the column is supported by continuing the vertical bar a , as shown in Fig. 82, first in the curved direction $a c$ and then vertically to b , which stands for any point in the column vertically above c . The vertical bar a' is continued in a similar manner to c' and b' , the bar a'' to c'' and b'' , and the bar a''' to c''' and b''' . The result is shown in plan by the thick lines in Fig. 83, where the axes of the vertical bars are diverted thus:— a to b , a' to b' , a'' to b'' , and a''' to b''' . Assuming that in this manner, let four other bars, b, b', b'', b''' , be attached (see Fig. 82), one at each of the points c, c', c'', c''' , and carried vertically downwards, as shown by dotted lines in the diagram, to the lower points b, b', b'', b''' .

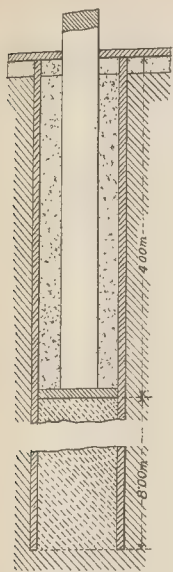


FIG. 77.

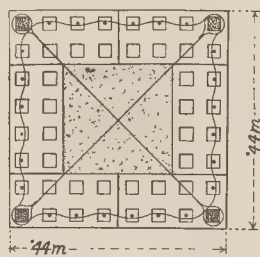


FIG. 78.

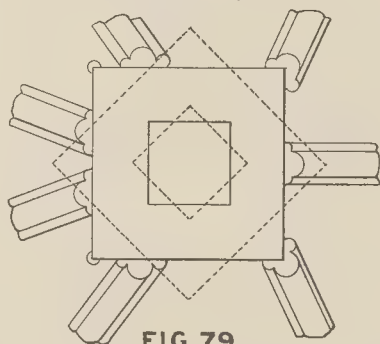


FIG. 79.

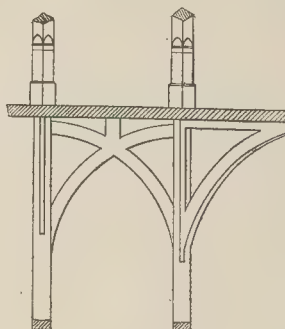


FIG. 80.

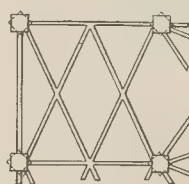


FIG. 81.

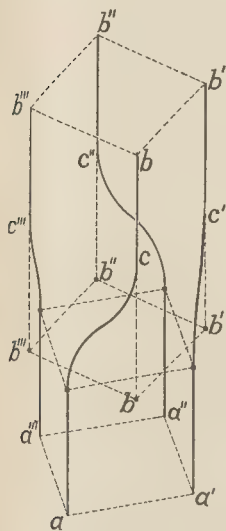


FIG. 82.

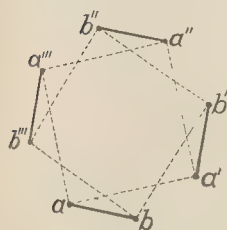


FIG. 83.

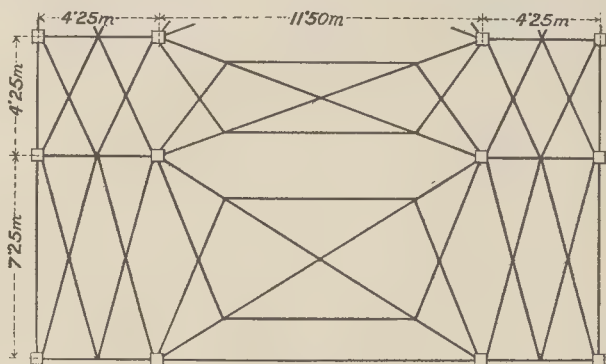


FIG. 84.

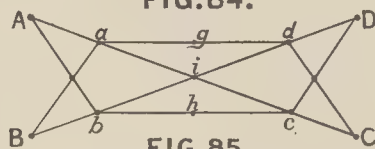


FIG. 85.

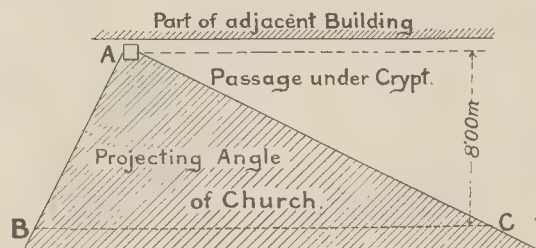


FIG. 86.

It is evident that these overhanging points must receive such support as the column above is able to afford, by means of the four bars which form a part of its system of reinforcement throughout its whole height above the floor of the church.

As the octagonal portion of the upper column (see Fig. 83) receives adequate support from below, and as a system of reticulated reinforcement (see Fig. 78) permeates the substance of each part of the column and passes unbroken from one portion to the other, there can be little doubt as to the value of the support given to the projecting corners. We must remember also that the bars ab , $a'b'$, $a''b''$, and $a'''b'''$, even though they are bent, possess sufficient rigidity to resist a considerable downward force exerted in the directions bcb , $b'c'b'$, $b''c'b''$, $b'''c'b'''$. Moreover, all the vertical rods or wires in the column are also bent to follow curves similar to those of b to c , b' to c' , b'' to c'' , and b''' to c''' in Fig. 82.

But the projecting corners of the columns in the church receive further support from three other parts of the structure, namely, the reinforced floor slab, the horizontal floor ribs, and the ribs springing from the columns in the crypt, as shown in Figs. 79 to 81.

Some of the longer ribs radiating from the columns are prolonged to form the joists of the church floor, while the shorter ones afford support by means of blocks placed at the point of intersection (see Fig. 80). As these stiffening ribs are braced together laterally, a series of four-legged frames is formed, each of which is able to carry a very great load upon its centre if the ribs be properly connected at the point of convergence. This part of the construction is, in fact, based upon the principles governing the design of domed or vaulted structures.

The mode of procedure adopted in connexion with the design of the church floor—or, as it may be termed alternatively, the crypt roof—is made clear by Fig. 85. Here the points A, B, C, and D stand for columns. Arched ribs Ai and Ab spring from A; similar ribs Bi and Bo from B; similar ribs Ci and Co from C; and similar ribs Di and Do from D. Connecting ribs ag , dq , meeting at g , and corresponding ribs bh , ch , meeting at h , complete the triangulated panel. Since all these arched ribs are braced together by the cement-steel floor slab, a comparatively small percentage of reinforcement is sufficient to insure very great resistance.

The principle here outlined has been extended to the whole of the floor system, and the result is the complete triangulation represented in Fig. 84, which is a skeleton plan of the ribs, 30 centimetres deep, with an average thickness of 7 centimetres, below a portion of the floor slab of the church. The position of this part plan may be identified by reference to Fig. 74 ante.

We may here mention that the reinforcement of the floor slab is disposed in meshes, which vary in size in accordance with the diagram of bending moments for different parts of the floor. In this way the metal is utilised in the most economical manner and the dead weight of the floor is reduced to a minimum.

It is stated that, on the completion of this building, the district surveyors of the city of Paris expressed a very decided reluctance to approve a floor constructed in accordance with the theory named and of the proportions described above. After due examination they declined to pass the work and proposed that it should be replaced by a floor following recognised methods of construction. As the designer contested this decision, it was ultimately decided by the authorities, to whom an appeal had been addressed, that the stability of the construction should form the subject of investigation by an experienced engineer. Accordingly, M. Boutillier, Inspector-General of the Ponts et Chaussées, formerly Professor at l'Ecole Nationale des Ponts et Chaussées, and at the present time Professor at l'Ecole Centrale des Arts et Manufactures, was commissioned to inquire into and report upon the matter. At the outset M. Boutillier was far from being convinced of the stability of the work, but after examination of the drawings and three stringent tests he was completely satisfied, and wrote a report which had the effect of reversing the decision made by the district surveyors.

This floor, in which panels measuring 11.50 metres by 7.25 metres are entirely supported upon four piers of 44 centimetres square, is certainly of much interest, not merely because

of its daring design, but also for the economy of construction which it exemplifies.

Let us now turn to the columns extending from the church floor and continued into the roof structure.

Fig. 73 ante is a longitudinal section of the church showing the manner in which the columns are branched out and finally become merged into the domed roof system. The strength and rigidity secured by extension of the columns in the form of arched ribs affording mutual support to each other has already been pointed out in connexion with the design of the crypt vaulting. It may be realised by considering the somewhat analogous case of a tripod, on which far more than three times the load can be supported than that which the three legs would be able to carry if employed separately as vertical columns. Further, if the three legs of the tripod be braced, the resistance of the frame is so greatly augmented that the cross-sectional area of the members may be considerably reduced. As illustrated by Fig. 73, this is practically the method which was adopted, only the straight legs and the straight bracing of the tripod are replaced by arched ribs and arched bracing. The bracing is further represented by the reinforced brick walls of the structure and by the reinforced cement surfaces of the roof system.

One of the most remarkable features of this church is to be found in an angle of the building where it was necessary to form a passage below the crypt (see Fig. 86). Here there is at A a column 44 centimetres square, which commences at ground level, and at the height of about 3 metres supports a platform, which constitutes the floor of the crypt over the triangular area A B C. The column rises straight above this floor to the height of 26 metres, to carry the ribs of the roof, and supports, in addition to the floor of the crypt, part of the floor and gallery of the church.

This part of the structure particularly struck the Inspectors-General of the Ponts et Chaussées who came to inspect the work. On approaching the span A B across the passage, 8 metres in width, they looked for the bressummer supporting the superstructure, and were considerably surprised when told that, apart from the wall itself, the only member in the nature of a bressummer was a steel bar 40 millimetres wide by 9 millimetres thick. Nevertheless, the explanation is perfectly simple. As in the case of the Rue de Lagny dépot of the Compagnie Générale des Omnibus, described in Arts. VIII. and IX., the wall itself constitutes the bressummer. In that building it will be remembered that the wall, 5.50 metres high, spans an opening 15.21 metres wide, whereas at St. Jean de Montmartre the wall is really a bressummer 26 metres high, spanning an opening of only 8 metres in width. Considering the great depth of the trussed wall, a little reflection will make clear the fact that a comparatively small amount of steel is necessary to provide for carrying very heavy loads, if only the reinforcing network is disposed so as to bind the construction together.

As will be gathered from the description and the illustrations—several of which have been reduced from the working drawings—the construction as a whole is designed strictly in accordance with mechanical principles, and the manner in which these are applied constitutes an interesting study. The church is certainly one that deserves personal inspection, and although our readers may not be anxious to emulate the example presented by St. Jean de Montmartre, they may learn from this building how great is the adaptability of reinforced construction, and how useful is the aid offered by the system to the architect who is bold enough to break away from stereotyped methods of realising his designs.

THE SANITARY INSTITUTE.—At an examination in Sanitary Science as applied to Buildings and Public Works, held in Birmingham, March 10 and 11, five candidates presented themselves, and the following two candidates were granted certificates:—Amos Evans (Nottingham); W. T. Hughes (Wolverhampton).

KIRKCALDY HARBOUR EXTENSION.—The estimates for the first section of Kirkcaldy Harbour extension have been received by the Town Council, and the tender of Messrs. Brand & Sons, contractors, Glasgow, has been accepted. Their offer is 25,900*l.*, while they are to be allowed another 500*l.* for alterations on the railway siding. It is expected that work will be commenced immediately.

ARTISANS' DWELLINGS, TOWN HALL ESTATE, BATTERSEA.

PROVISION has been made on this estate for housing thirty-six families, or about 150 persons. There are two types of dwellings—viz., two-roomed and three-roomed tenements. Most of the three-roomed tenements in Theatre-street have a frontage of 23 ft. 9 in. and a depth of 27 ft. 6 in. The living-rooms measure 14 ft. 7 in. by 10 ft. 7 in., bathroom-scully, 9 ft. by 7 ft. 3 in., and bedroom 15 ft. by 8 ft. 6 in. each. One bedroom to each first floor tenement is a little larger, and measures 15 ft. by 11 ft. 6 in., exclusive of space over staircase. The two-roomed tenements have a frontage of 17 ft. 6 in., and a depth of 29 ft., the living-room measuring 13 ft. 6 in. by 13 ft. (inclusive of porch), bathroom-scully, 13 ft. 6 in. by 6 ft., and bedroom 10 ft. 6 in. by 10 ft. The three-roomed tenements to Town Hall-road have a frontage of 23 ft., and a depth of 27 ft. 6 in., the living-room measuring 13 ft. 10 in. by 10 ft. 7 in., bathroom-scully 9 ft. by 7 ft. 3 in., and bedrooms 15 ft. by 8 ft. One bedroom to each first floor tenement is a little larger, and measures 15 ft. by 11 ft., exclusive of space over staircase. The two-roomed tenements in the centre of Town Hall-road have a frontage of 26 ft. 6 in., and an average depth of 18 ft. This extra length of frontage has been necessitated owing to there being very little depth of land at the back of the Town Hall estate, previously erected on the site. The living-room measures 13 ft. 6 in. by 12 ft. 10 in. (inclusive of porch), bathroom-scully 10 ft. by 6 ft., and bedroom 12 ft. 6 in. by 9 ft. The height of all living-rooms and bedrooms is 8 ft. 9 in. in the clear. The whole of the tenements are fitted with kitchen, copper, bath, and sink, and the tenement on the first floor are, in addition to the front entrance staircase, provided with rear staircases giving access to the back garden which is allotted to each tenement. The living-rooms are fitted up with combined food cupboard and dresser, with cupboard under and pot-rack above. There are picture rails in the whole of the living-rooms, and a hanging wardrobe in the bedrooms. Ample shelving accommodation is provided in the sculleries, and hat and coat rails in the passages. The dwellings are built of good hard stock bricks, the fronts being faced with Leicestershire red, and the roofs slated with Welsh Countess slates, capped with red ridge tiles, the coping to the party walls being red tiles. The whole of the heads and gills to windows are constructed of granolithic, the entrance doorways being surmounted by a projecting canopy, with moulded brackets, supported by a segmental arch. The front entrance doorways and the back entrance doorways have salt-glazed bull-nosed reveals. The floors are constructed of coke breeze and Portland cement, the first floor being supported with steel joists, and the boarding nailed direct to the coke breeze. The walls between the passages and the bedrooms are also constructed of coke-breeze slabs, 3 in. thick, set in cement, the plastering to the walls being executed in sirapite plaster. The whole of the sills, heads, copings to gables, canopies, and brackets to entrance doorways, are constructed in granolithic. The windows are framed with moulded bars in small squares, to economise in the case of broken panes, and are fitted with deep beads for ventilating purposes. The front and back doors, also scullery doors, are fitted with fanlights to open so as to provide through ventilation. The whole of the internal woodwork throughout the building is grained in oak and twice varnished, the walls of the living-rooms, bedrooms, and passages being papered, and the scullery discoloured. The elevations of moulded coping quite plain, but gables with beads have been introduced over some of the entrance doorways to form a break in the skyline. The houses in Theatre-street are set back lineable with the existing villas, the forecourts being enclosed with dwarf wall with stone coping and wrought-iron railing. Each tenement has its own separate entrance and back garden, and the whole of the floors are fireproof, these being constructed of coke-breeze concrete and steel joists. The houses are provided with venetian blinds to the windows (made at the Council's workshops), and are wired throughout and fitted with electric light and fittings by the Council's workmen, and electrical energy will be supplied on the penny-in-the-slot system, at a cost of, approximately, 1*d.* per night. The most interesting portion of the kitchen or living-room and the scullery-bathroom is the combined kitchen range, copper, and bath arrangement, patented by Mr. Court. The cillor Cornes, of Leek, Staffordshire. The apparatus has been designed so as to secure the maximum of convenience with the use of a cooking, heating, and washing, with the use of a

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hot or cold bath, at a minimum cost of fuel. The heating and cooking range is fixed in the kitchen, the grate being in the centre with an oven on one side and a boiler on the other. The boiler has a capacity of twelve gallons of water, ten gallons of which can be run off; the remainder being held in reserve. The water is heated by a moderate heat for general domestic requirements, but if hotter or boiling water is wanted it may be quickly obtained by taking a few live coals from the main fire through an opening at the side of the range into a small secondary grate fixed under the boiler. The estimated cost of the scheme, including the formation of Town Hall-road, which has been paved throughout with patent Hard York Non-slip Stone, is 10,414l. The whole of the work in the buildings, including the making and fixing of the granolithic sills, heads, canopies, brackets, lintels, concrete partitions, slabs, etc., has been carried out by the Council's Works Department, and the wrought-iron railings have also been made and fixed by the Council's workmen. The two-roomed tenements are being let at 6s. 6d. per week, and the three-roomed tenements at 8s. 6d. per week. The dwellings were opened on March 11 by the Mayor of Battersea, Alderman W. J. West. The plans and specifications have been prepared by the Borough Surveyor, Mr. T. W. A. Hayward.

WESTMINSTER CITY COUNCIL.

The usual fortnightly meeting of this Council was held on Thursday last week at the City Hall, Charing Cross-road.

London Building Acts (Amendment) Bill.—The Law and Parliamentary Committee reported the receipt of letters relating to this Bill from the Barlinchmere Club and the Incorporated Association of Municipal and County Engineers. The letter from the latter body enclosed the following resolution:—"That the London Building Acts (Amendment) Bill, 1905, apart from its drastic character and its interference with the powers and duties of the metropolitan borough councils, tends to further confuse and increase the working difficulties of the present laws relating to streets and buildings in the Metropolis; and, in the opinion of this Association, the Bill should be withdrawn and a new measure introduced, consolidating into one Bill all the statutory provisions necessary for governing the formation of streets and buildings, simplifying the present laws, and relegating to the borough councils all duties which, in the opinion of Parliament, can be properly entrusted to them, and thus relieve the London County Council of some portion of the enormous burden of work cast upon them." A letter was also received from the Ward Clerk of the Copmanstreet Ward enclosing copies of resolutions passed at a recent ward meeting of that ward. The resolutions condemned the provisions of the Bill generally, and suggested that, if the Acts required amending, the remedy was an entirely new Act drawn up by the Government in consultation with the Corporation, the London County Council, the Local Authorities, the Royal Institute of British Architects, and the Surveyors' Institution. It was directed that the receipt of the letters should be acknowledged with an intimation of the steps taken by the Council in opposing the Bill.

Tramways over the Bridges.—The same Committee also reported the receipt of a copy of the resolution passed recently by the Camberwell Borough Council in support of the London County Council's proposals to construct tramways over Thames bridges and along the Victoria-embankment.

Broadstreet and South Molton-street: Proposed Widening.—The Improvement Committee submitted a lengthy report on this matter, and recommended that the widening should be carried out, and that the Council should acquire the necessary property. A resolution to this effect was carried.

Mouth-court, Proposed Closing.—The same Committee reported having received a letter from Mr. H. T. Turner, on behalf of his clients, Messrs. Hampton & Sons, asking that Messrs. Hampton & Sons should be allowed to absorb Mouth-court and build over it at once in accordance with a plan submitted, Messrs. Hampton to agree on their part to build over their freehold property on the north side of the street, the same line of the new street, and to surrender to the Council, when required for the new street, the remaining portion of their freehold and court. The letter pointed out that this arrangement would obviate the necessity for the Council paying compensation for setting back the new buildings which would be erected projecting over the line of the new street. The Council were of opinion that the offer was not an advantageous one for the Council, and recommended that it should not be accepted. The Council agreed to this, and, having transacted other business, adjourned.

BAPTIST CHURCH AND SCHOOLS, ST. ANDREW'S-STREET, RUGBY.—The foundation-stone of these buildings was laid on Wednesday last, the 15th inst. The buildings are faced externally in red brick, the dressing being in Bath stone. The church will accommodate about 760 persons, and the school over 300. The contract was let to Messrs. Linnell & Son, of Rugby, for 5,881l. 8s. 3d. The architects are Messrs. George Baines & R. Palmer Baines, of London.

BOARD SCHOOL IMPROVEMENT, DUNDEE.—Designs have been prepared by Mr. J. H. Langlands, architect to the Dundee School Board, for alterations and extensions which are to be made to the Ancrum-road school. The plans provide for the addition of a flat and attics over the entire range of the existing school buildings. By the alterations the accommodation will be increased from 779 to 1,400 pupils. A central hall for physical drill will be constructed, and on the upper flat fourteen additional classrooms will be provided. The estimated cost of the work is 7,500l.

PAROCHIAL ROOMS, NETHERTHORPE.—On the 9th inst. the foundation-stone was laid of the new parochial rooms, which are being erected in connexion with St. Anne's Church, Netherthorpe. The lower floor is to consist of one large classroom and two smaller classrooms, kitchen, cloakrooms, and heating vault. The upper floor will comprise one large hall extending the length and breadth of the whole building, and capable of accommodating about 300 people. The architects are Messrs. J. D. White & Son, and Messrs. George Longden & Son, Ltd., are the contractors.

REFORMATORY, CATTAL, YORKSHIRE.—This new building is on the high land in the angle formed by the crossing of the York and Knaresborough, and the Cattal Station and Whitley roads. The main entrance is by the administrative block which is flanked on either side by the male and female blocks. It, and the other parts of the institution, is of red brick with yellow stucco, and in general design the buildings are similar to those erected by Messrs. Cadbury at Bourneville. The entrance is surmounted by a clock tower, and the administrative block consists of offices and quarters for the staff, and there are reception-rooms on either side into which those committed to the reformatory will first be received. Flanking the central blocks, are, on the left, the women's quarters, and on the right those for the men. The establishment consists of three principal parts, and in the rear are a laundry, boiler-house, and a tower, the whole site being about 2 acres in extent. The tower provides the means whereby water, after having been pumped to a height of 50 ft. from the ground, can be distributed to all parts of the premises. There is to be accommodation at first for sixty women and twenty men, who will be engaged in field work on the land around the reformatory, and in domestic duties, and as far as possible, it is intended to make the institution self-supporting. The whole establishment will be lighted by electricity, and there is a hot-water service for the laundry, lavatories, and baths, and for heating. One of the features of the institution is a large recreation-room, which is fitted with a platform. The buildings are so planned that extensions can be made if necessary until ultimately accommodation may be found for 250 patients. The institution has been designed by Mr. Vickers Edwards, the West Riding architect, the builders were F. W. Denholme & Co., of Wakefield, and the engineering work, heating, water supply, drainage, etc., has been under the direction of Messrs. Ashwell & Nesbitt, of Leicester and London, while the Wallsall Electrical Company were the contractors for lighting. There being accommodation for sixty women and twenty men, there are three blocks for the former and one for the latter, and they are connected with the administrative block by covered but open corridors. Each of the blocks is about 100 ft. in length, and a like distance apart. Each inmate will have a small bedroom, which can be heated if desired. There is a large assembly or recreation room, with a platform. The kitchens are fitted in modern style, and there is a large laundry. The power for pumping, for the hot and cold water supply, the baths, fire appliances, and for lighting, is provided by a large steam boiler. Sewage is treated on the bacteria and patent triple-contact system of Messrs. Adams & Co., engineers, York, in tanks in a field some distance away, and when clarified is discharged into a stream.—*Yorkshire Herald.*

MINERS' HALL, SEATON DELAVAL.—The new miners' hall at Seaton Delaval was opened recently. The building is of brick, with facings of stone from the Burradon Quarries, and it occupies a site by the side of the Shields and Morpeth main road. The hall proper will accommodate 600 people, and there

are also offices for the transaction of the business affairs of the Seaton Delaval branch of the Northumberland Miners' Association. The contract has been carried out by Messrs. T. Robinson & J. Edwards, of Seaton Sluice, from plans prepared by the late Mr. Joseph Dobinson, at an approximate cost of about 1,250l.

INSURANCE OFFICES, GRIMSBY.—The new buildings for the Royal Insurance Company, which have been erected on a site at the corner of Victoria-street and Brewery-street, Grimsby, are from the designs of Mr. H. C. Scapling, architect, Grimsby. The plinth and dado are in polished grey granite, with Burnantofts buff terra-cotta to the height of the first floor, and to the whole of the cornices and window dressings, together with the domed turret over the main entrance to the offices. The facing bricks are red Accrington, set in white mortar. The angle entrance and turret is flanked by a gable on either side. The roofs throughout are slated. The ground floor is occupied entirely by the Royal Insurance Company, and consists of a general office, 34 ft. by 20 ft., with manager's private room and entrance lobby to the front. The rear of the premises is occupied by cloakroom, lavatories, strongroom, and a room for bicycles and stores, and a back entrance. The first and second floors have been let to the Grimsby and County Club, and are reached by an independent side entrance-hall and stone staircase, giving access on the first floor to a billiard-room, with two tables, reading-room, steward's room, cloakroom, and lavatories. The second floor comprises a large dining-room, which can be divided by removable screens, kitchen, larder, and out-offices for the staff. The floors throughout are of fireproof construction, and laid with maple wood blocks, the office and club entrances and hall are laid with black and white marble slabs. The woodwork, paneling, and screens and office furniture throughout is in fumed oak. The premises throughout are lighted by electricity. The general contractors were Messrs. J. H. Thompson & Sons, Grimsby; the fireproof floors and wood blocks and steel construction are by Messrs. Homan & Rodgers, of Manchester; the plumbing, glazing, and electric installation has been carried out by Mr. D. J. Dolby, Grimsby; the masonry work has been done by Mr. W. T. Green, Grimsby; the terra-cotta has been supplied by the Burnantofts Works, Leeds, and the desks, counters, and other furniture is the work of the Wellington Furnishing Company, Grimsby; the slating has been done by Messrs. Dawber, Townsley & Co., Grimsby; the grates and mantelpieces have been supplied by Messrs. Geo. Wright & Co., Rotherham, and Messrs. James Duke, Ltd., Grimsby.

PANMURE GOLF CLUBHOUSE, BARRY.—Mr. T. Martin Cappon, architect, has prepared plans for the remodelling and extension of this building. The chief feature of the improvements is a smokerom and dining-room to the left of the block, while the present dining-room is to be converted into an entrance hall, and there will be a smoking-lounge in the tower. Extra box and cloak room accommodation is to be secured by utilising the existing smokerom, and all the necessary conveniences are also provided. The hall and public rooms will be panelled. In addition, the plans provide for the extension of the clubmaster's house. A verandah will run along the whole length of the front of the building, and there will also be a verandah on the tower. The new clubhouse is to be built of harled brick, with red tiles, and is estimated to cost about 2,300l.

PUBLIC LIBRARY, GOOLE.—The new public library at Goole, which has been erected by Mr. John Walker, builder, from designs prepared by Mr. H. B. Thorpe, architect, both of Goole, has just been opened. The style adopted is the late Perpendicular. Red glazed bricks have been used for the front of the building. On the right and left of the doorway are panels bearing coats of arms. In the centre of the ground floor is the lending department, containing 1,719 volumes, of which 600 are works of fiction. There is also a reference library, and separate rooms for newspaper readers and magazine readers are provided. The upper floor is set apart as a lecture-room.

NEW BAKERY, STIRCHLEY, BIRMINGHAM.—A model bakery has just been completed at Stirchley, near Birmingham, for the Ten Acre and Stirchley Co-operative Society. The building consists of a main block of three stories in height; the top floor is used for the flour stores, the second for the general machinery for flour-mixing, dough-dividing, cake machines, etc., and a portion is screened off and specially heated for dough proving, and on the ground floor is the bakery and the ovens, two of which are yet only put in, but space remains for two more, they are Baker & Sons' patent draw-plate, double-

decker, continuous pattern, costing 350*l.* each. Adjoining the main block is, on the north, the oven block, with a sloping passage at the rear of the ovens, and a fuel store; on the east side is the entrance and staircase, off which bathrooms, men's messroom, etc., are arranged, and beyond which, on the ground floor, is the breadroom and loading platform. Stablings, etc., are also provided off the yards adjoining the building. In the construction, the floor loads have been taken off the walls and conveyed to the concrete footings direct by a system of steelwork built into the walls, and for this and the floor girders the new wide-flange, heavy-section "Differdange" beams have been employed, those for the main spans bearing 38 ft., and are placed in bays of 10 ft. centres. The floors are of concrete reinforced with steel angle-iron and wire mesh and rods, and finished with granolithic paving. The work amounts in cost to 3,400*l.* (exclusive of the cost of the ovens), and has been carried out by Mr. W. Harvey Gibbs, builder, King's Heath, Birmingham; the steelwork by Mr. Frank W. Saffield, of Birmingham. The architect is Mr. Francis B. Andrews, of Birmingham.

FOREIGN.

FRANCE.—At the request of the Vieux Paris Committee, the Prefect of the Seine has decided to preserve the two pavilions on the Place de la Nation built in 1787 from the designs of Ledoux, and which formed part of the celebrated "mur d'enceinte" of the *Fermiers-Général*.—The Municipality of Courbevoie has decided to carry some important architectural improvements at a cost of 2 million francs.—M. Albert Benard has completed, for the next Salon, part of a ceiling at which he has been working for two years for the *Comédie Française*. It represents Apollo on his car drawn by four horses and surrounded by figures symbolizing the house of the day and night, saluting the great French dramatic poets—Corneille, Racine, Molière, and Victor Hugo, to whom the Muses bring crowns and palms.—An exhibition of the works of Whistler is to be opened at the Ecole des Beaux-Arts in May.—The Municipality of Dijon has voted a sum of 640,000 francs for town improvements, including the enlargement of the museum.—The works are to be shortly taken in hand for the completion of the quays and jetty at Ajaccio, at the cost of a million francs.—The municipality of St. Etienne propose the building of a new circus-theatre, at a cost of 673,000 francs.—A scheme is under consideration for the construction of a canal from Moulins to Sarcelles. The expense is estimated at 16 million francs.—The Government has combined with the town authorities of Châmbéry to purchase the house and garden known as "Les Charmettes," for a long time the residence of Rousseau.—M. Jules Thomas, the eminent sculptor, has died at the age of eighty-one. He carried off the *Prix de Rome* in 1842. His career may be considered as divided into two portions, the first having been devoted to the production of a number of remarkable works—"Orphée," "Le Soldat Spartiate Apporté à sa Mère," "Attila"; the statues of Virgil and of Midde. Mars; and numerous allegorical works decorating the gardens of the Tuileries, the Louvre, etc. All these works are in a faultless classic style and most carefully modelled; and the reputation gained by them opened to him the doors of the Institut, where in 1875 he was appointed to the post of Professor at the Ecole des Beaux-Arts. During this second part of his life he was almost entirely occupied by the exercise of his duties as Professor; although, as late as 1903, he exhibited a statue, "L'Adolescence," which showed that age had in no way affected his powers. It was his last work.—We have also to record the death, at the age of fifty-two, of another sculptor, M. Bastet, who, commencing his artistic education at the Ecole des Beaux-Arts of Avignon, became subsequently a pupil of Dumont and of Jules Thomas. Among his works may be mentioned the "Vigne Mourante" (Salon of 1881); "La Source de Vaucluse" (1882); "L'Abandonnée" (1886); "Manon," purchased a few years ago by the municipality of Paris, and which is in the Petit Palais collection; and "Eve," which was bought last year by the Conseil Général of the Seine.—We have also to record the death, at the age of 81, of the eminent engraver on medals and precious stones, M. Galbrüner, an old pupil of Rude and of Faronch. He made his *début* at the Salon of 1848, and was noted especially for the perfection of his cameo in the style of antique work. He had received medals at five Salons, 1860 being the last.

GERMANY.—The new cathedral at Berlin, built by Professor J. C. Raschdorf and his son, Professor Otto Raschdorf, was consecrated on February 27.—The so-called

"Kaiserhaus," at Hildesheim, has been bought over by the town so as to ensure its preservation; the house owes its name to the medallions containing heads of Roman Emperors that are on its facade, and to four great statues each standing between columns and representing Judas Maccabeus, Hector, Alexander, and Julius Caesar.—Competitive designs from German architects are invited for a new modern school (Realschule), to be built at Eisleben.

SWITZERLAND.—In a competition for designs for the Exchange, to be built in the "Fish Market," at Basel, the first premium was awarded to the architects, Herr H. Weideli and Herr R. Bischoff.

AUSTRIA.—An Industrial Exhibition will probably be held in Vienna in 1908 to commemorate the sixtieth year of the reign of the Emperor Franz Josef.—The architects, Fellner & Helmer, of Vienna, have undertaken to design the new theatre for Posen.—The architect, Herr Ludwig Baumann, has been commissioned to design the new commercial buildings for the Ministry of Commerce.

DELAGOA BAY.—To meet the increased demand it is intended to introduce an additional supply of water to the Town of Lourenço Marques, at an estimated cost for construction of about 87,000*l.* The new supply will be taken from the river Umbeluzi at a point eighteen miles from the town. The scheme will provide for all the requirements of a population of 35,000, consuming 2,000,000 gallons of water daily. The necessary surveys and plans for the additional works have been prepared by Mr. Frank N. Gibbs, engineer for the works, and these plans have been submitted to Messrs. Beesley, Son, & Nichols, Westminster, consulting engineers to the Delagoa Bay Development Corporation. The works are to be proceeded with at once.

MISCELLANEOUS.

ARCHITECTURAL ASSOCIATION STUDENTS' "SMOKER."—This entertainment will take place on the 28th inst. at the Monico, 9 p.m., when the President, Mr. Guy Dawber, will occupy the chair. The proceeds are to go towards the expenses connected with the new premises in Tufton-street. About 200 tickets have been sold, but, to make a substantial profit for the building fund, it is estimated that at least 500 must be sold, so we hope that those who desire to combine a pleasant evening with assisting a good work will not overlook the opportunity.

THE TOWING PATH, RICHMOND.—Considerable dissatisfaction is expressed by residents in Richmond and the vicinity with the proposals of the Office of Works to erect an iron railing along the river towing path for about one and a half miles between the railway bridge and the south-west corner of Kew Gardens opposite St. John's House. A stream, known as the Ha-ha, having some prettily-wooded islets and banks, separates the towing path from the Old Deer Park; the iron railing would exclude the public from the outer bank of the stream, and would, it is urged, afford no compensating advantage, whilst destroying the present amenities and rusticity of the path and its surroundings.

THE VENTILATION OF THE HOUSE OF COMMONS.—During the recess effect was given in part to the recommendations of the Select Committee of the House of Commons by way of a new type of water screen for a complete washing of the air, the provision of a much more powerful intake fan, and a better isolation of passages joining the main air-ways. The extract fan is not completed yet, but some experimental tests will be made for securing a better distribution of air to the chamber, and for testing the air so distributed. A report is issued of a prolonged investigation conducted in the course of last session by Dr. M. H. Gordon, assisted by Dr. W. H. Hunter, Demonstrator of Public Health Chemistry at St. Bartholomew's Hospital, and by Dr. J. Aitken, by request of the First Commissioner of Works. Dr. Gordon considers that the existing air inlet should be raised and widened, and that traffic over the north inlet should be abolished. He suggests, too, that in future the moistening spray for purifying the air should be regulated, and, if possible, occasionally, used, and advocates the adoption of increased measures of precaution, to include the removal or else the rendering absolutely air-tight, of the three doors between the ventilating fan and the inlet, the prohibition of traffic across the air-way whilst the House is sitting, the suspension of shallow pans charged with perfectly clean water, and, if possible, of wet mats also, in the battery chamber over the heating apparatus, in order to satisfy the natural avidity for moisture of the heated air, and the keeping of more continuous and complete hygrometrical records. Dr. Gordon further points out that hair matting might be found to be more suitable than the string

matting now in use for the floor covering of the House, as the latter is liable to become injured by steam, and therefore only furnishes the admitted air, and that the air from the legislative chamber at the end of the ceiling over the Speaker's chair and the ladies' gallery should be more effectually withdrawn.

CONCRETE FOUNDATIONS FOR PAVING.—Recent experience in Germany shows that the use of concrete as a foundation layer is attended with considerable advantage in the case of certain kinds of paving, such as granite, wood, and asphalt, if the earth be sufficiently consolidated. However little the concrete may have hardened during the first month, its resistance to the action of the load to be supported is very noteworthy. At the same time it is desirable, by way of additional precaution, to make the thickness of the underlying layer of concrete very ample so as to secure adequate resistance to flexure. The proportions recommended for concrete to be used in this manner are six parts of gravel to one part of Portland cement. The gravel should be of uniform quality, and the pieces contained in it should not measure more in any direction than the equivalent of one-fifth the thickness of the foundation layer to be formed.

CANADIAN CEMENT.—Sir Sandford Fleming, President of the Board of Directors of the International Portland Cement Company, Hull (Quebec), is reported as having said, after a visit of inspection to the works of the Company, the other day, "I am greatly satisfied with all I saw. The plant appeared to me to be first-class and most ingenious and complete in its saving of labour and economical construction. I am satisfied that it will be one of the most important industries in this country. The use of cement as a building material has come at an opportune time, for timber is beginning to get very scarce. One has only to pay a visit to the Ottawa University to be convinced of its great utility and value. That building is entirely of cement, and is practically indestructible."

MANCHESTER INFIRMARY SITE.—A meeting of the Royal Infirmary Special Committee of the Manchester Corporation was held on the 7th inst. at the Town Hall. The Committee, it was stated at the close of the meeting, decided to prepare a report for presentation to the Council showing how the site of the Infirmary could be utilised for the purposes of an Art Gallery and Free Reference Library, and the City Architect was instructed to prepare a plan showing what portion of it was available for building purposes.

TRIBUNALS FOR SANITARY PROSECUTIONS.—Chelsea Borough Council considered, at its last meeting, a letter from the Islington Borough Council, stating that its attention had been called to recent decisions of police magistrates as indicating the need for sanitary assessor to be appointed to assist them in dealing with cases which involve a technical acquaintance with sanitary work, and that, in certain prosecutions under the Building Act, the assistance of technical experts had been found to be of advantage. The Islington authority desired to know if the Chelsea Council would be prepared to join in making representations to His Majesty's Government in the matter. The Medical Officer of Health (Dr. Parkes) submitted the following report:—

"From 1891 to 1894 the same question was raised in Chelsea that is now being the subject of consideration in Islington. The decisions of one of the stipendiary magistrates sitting at Westminster in Chelsea sanitary cases were considered to be unsatisfactory by the vestry and its officers, and this led to a deputation being received by the Under-Secretary of State for the Home Department in 1894, who heard the views of the vestry on this subject. It is probable that some representation was made by the Home Secretary to the court at Westminster, but shortly after the practice of taking cases to Westminster ceased, as the Petty Sessions Court at Kensington was called at that time again to exercise jurisdiction in sanitary and adulteration cases, such jurisdiction having been in abeyance for a considerable period, owing to uncertainty as to the powers of the court. The methods employed at Kensington in the adjudication of sanitary and adulteration cases are undoubtedly better than those prevailing in stipendiary courts elsewhere, and I consider that the Borough Council has every reason to be satisfied with the decisions given at Kensington. I should suggest that the Islington Borough Council be advised, if they are dissatisfied with the decisions of the stipendiary magistrates in their borough, to ask to be received as deputation by the Home Secretary, so that their views might be laid before the Government Department that exercises some sort of magisterial supervision, and that, failing any action by the Home Secretary, they would be desirable to convene a conference of metropolitan sanitary authorities, with a view to taking joint Parliamentary action for the redress of the grievances which are likely to be seriously hampering the administration of the Public Health Act by the responsible authorities."

This report was approved, and representations are to be made to the Islington Council on the lines suggested.

NORWAY TIMBER TRADE. Sir Rennell Rodd, K.C.M.G., His Majesty's Minister at Stockholm, reports that there is every probability of there being a considerable shortage in the supply of Norwegian timber and wood pulp during the current year. Up to the present time, Sir Rennell Rodd states, there has been scarcely any snow in Norway, and snow is an essential element for the transport of timber by sleigh to routes of communication. Consequently a great deal of timber has had to remain where it was felled, and the season is now too far advanced for there to be much prospect of its now being conveyed to the markets. The weather throughout last summer and autumn was also exceptionally dry, and there is great fear that the necessary water to drive the saw-mills will fall during the present year. Even if rain were to fall now in abundance, the frozen condition of the soil in the mountains would prevent its absorption and retention. The outlook, therefore, for the timber, pulp, and wood fibre trade is far from reassuring.

PIAL BOARD, EXETER CATHEDRAL.—A tablet has been placed in Exeter Cathedral to commemorate the first peal of Grandiose Caters rung upon the cathedral bells by residents in Devon. The work has been carried out and fixed by Messrs. Harry Hems, of Exeter.

"MITCHELL'S NEWSPAPER PRESS DIRECTORY."—

We have received the Diamond Jubilee issue of "Mitchell's Newspaper Press" (C. Mitchell & Co., 1 and 2, Snowhill, Holborn-viaduct, E.C.), which has just been issued. It not only contains full particulars of the newspapers, magazines, reviews, and periodicals published in the United Kingdom and the British Isles, but considerable information as to the Continental, American, Indian, and Colonial papers, etc. In addition to a newspaper map, it also contains the following articles:—"The Daily Newspaper of To-day," "The Judgment of the Press," "The Empire and the Traffic," "The Australian Labour Party," "The Early Struggles of the Colonial Press," and "The Legal Year in its Relation to the Press." The arrangement of the work is excellent, and the information under the separate towns is of considerable use.

YEB BOOK OF AUCTION SALES.—"The Land and House Property Year Book" for 1904 ("Estates Gazette," St. Bride-street, E.C.) is the thirteenth year of issue of a useful and careful record of the sale of land and house property during the past year. The work is clearly printed and arranged, and is published at 7s. 6d. net.

ASSOCIATION OF TEACHERS IN TECHNICAL INSTITUTES.—The first ordinary meeting of the

building section was held on Saturday, March 11, in the Regent-street Room, at the Regent-street Polytechnic. Mr. Hugh Davies, head of the architectural and building trades department, Northern Polytechnic, in the chair. A paper, entitled "The Training of a Craftsman," was read by Mr. E. L. Bates, of the London County Council School of Building, Brixton, S.W. The paper reviewed the past training of the craftsman, set forth in the chapters of several of the City Companies, emphasised the entire lack of any systematic training at the present time, the difficulties of teachers and students under present conditions, and made valuable suggestions for the efficient training of the future craftsmen. After suggestions and criticisms by the chair, the secretary and others, it was felt by all present that it was not possible to discuss adequately the paper in an impromptu manner, and it was decided, on the suggestion of Mr. Hobart Pritchard, of the Regent-street Polytechnic, to adjourn the discussion to the next meeting of the section, on April 1, and that, in the meantime, the paper be printed and circulated in order that members might give the matter careful consideration. The meeting was of the opinion that some practical scheme would be evolved as the result of the discussion, and which, taking into account the personnel of the section, would be a valuable contribution towards the solution of a very difficult problem. A vote of sympathy with Mr. C. F. Mitchell, head of the Technical School, Regent-street Polytechnic, on his present serious illness, was passed unanimously.

PROPOSED SEWERAGE WORKS AND WORKING-CLASS DWELLINGS.—BRIGHTON.—Major J. Stewart, R.E., held a Local Government Board inquiry at the Brighton Town Hall on the 13th inst. into the applications of the Brighton Corporation for sanction to borrow £410,000 for the purchase of the forecourts in Gloucester-place for the purposes of street improvements. Among the respondents were the Town Clerk (Mr. Hugo Talbot) and the Deputy Borough Surveyor (Mr. A. Weller). The Town Clerk said the sewer proposed was one in addition to the existing means of draining that area. The existing Preston Park-avenue sewer was no longer equal to its work. The new sewer would extend from

Preston-drove to Stanford-avenue (Preston-road end), being laid through Preston Park under the Ride. Only a portion of the loan was to be raised at present, the amount required being just over 1,000. The remainder of the scheme would be completed when it became necessary. Turning to the second sum required, the Town Clerk indicated that the purchase of the forecourts fronting Gloucester-place Baptist Church was part of a scheme for widening that thoroughfare. The property was freehold, and covered 423 sq. yds. The costs of the purchase were not included in the 600L. In the evening Major Stewart conducted another inquiry in respect of an application for sanction to a loan for the erection of three working-class dwellings in St. Helen's-road, Brighton. The amount asked for was 950L; but the Town Clerk explained this had been reduced to 875L.

MEMORIAL TO CANON AINGER, BRISTOL CATHEDRAL.—The committee for promoting a memorial to the late Canon Ainger in Bristol Cathedral have resolved to devote the amount contributed, which exceeds £400, to filling in with stained glass the western window of the south transept, and to the erection, in a recess in the south wall of the nave, of a mural tablet of architectural design, and containing an inscription. The work of the window has been entrusted to Mr. C. E. Kempe, London, and of the tablet to Mr. C. J. Harold Cooper, also of London.

EDINBURGH JOINERS.—The Edinburgh Master Joiners have notified the operatives that the present working agreement between them which runs annually from April 14 will not be renewed by them.

STANDARD'S NEW MAP OF METROPOLITAN RAILWAYS, TRAMWAYS, AND MISCELLANEOUS IMPROVEMENTS.—Owing to the increasing number of projects for tubular railways, the present issue of this useful map is in two sheets, each of the dimensions formerly adopted for the complete map of the Metropolitan. The improvement effected by this enlargement will be very evident to those who have had occasion to use previous editions of the same publication. In spite of the check given to enterprise in the direction of traffic facilities, a considerable number of schemes is comprised in the list of plans deposited at the London County Council for the session 1905. We cannot refer to all these in detail, but will briefly mention some of the more important. In the north-eastern district two railways very much needed are the North-East London line, from the City through Bethnal Green, and thence into Essex, via Hackney, Leyton, and Walthamstow. The neighbouring districts of Shoreditch, Stoke Newington, and Clapton are also to be served by the eastern end of the Hammersmith, City, and North-East Railway, of which one branch runs out into Essex, and another continues in a northerly direction through Tottenham. In the north-western district are the Baker-street and Waterloo and the Charing Cross, Euston, and Hampstead railways, all being excellent schemes that will link up the various terminal stations between the Angel and Paddington, with other terminals at and near Charing Cross. The proposals of the Central London, the Great Northern, Piccadilly and Brompton, and the Hammersmith, City, and North-East railways also deserve hearty support. In addition to ordinary and underground railways, numerous tramway extensions are projected in all parts of London outside the central area, some by the County Council and others by private companies. When the report of the Traffic Commission has been published, we may reasonably expect that many schemes will be brought forward to provide more completely for the pressing needs of the Metropolitan, especially in the way of communications from north to south. Under the head of "Miscellaneous Improvements" we are pleased to notice the project of the Metropolitan Pneumatic Despatch for the establishment of a parcels service, similar to that already in operation in many American cities. As usual, the map is excellently produced, but the shade adopted for indicating "railways sanctioned" is rather too faint to be readily distinguishable, especially in the parts of the map that are coloured.

Legal.

DAMAGE TO HOUSE BY TUBE RAILWAY.

THE hearing of the case of Stockton and others v. the Great Northern and City Railway Company concluded before Mr. Justice Lawrence and a special jury in the King's Bench Division, on the 10th inst., after a five days' trial.

This was an issue to determine the amount of compensation (if any) to which the plaintiffs were entitled for alleged injury to their premises by reason of the construction and working of the defendants' tube railway.

Mr. J. P. P. Rawlinson, K.C., and Mr. Dobb appeared for the plaintiffs, and Mr. McCall, K.C., and Mr. A. Lankester for the defendants.

Mr. Rawlinson, in opening the case, said that the plaintiffs were the personal representatives of a gentleman named O'Brien, and the action was brought by them in respect to the injury caused to their house, No. 20, Highbury-crescent, by reason of the construction of the defendants' tube railway. The facts of the case were as follows:—In 1895 the late Mr. O'Brien took a lease of the house for twenty-eight years, which was determinable at the end of seven, fourteen, or twenty-one years. He took it from a Mr. Wynn, and the lease contained the ordinary stringent repairing covenants. At the time Mr. O'Brien went there he liked the locality, and thought it would be a most desirable residence for himself and his three daughters. After he had taken the place he built some stabling, and he also spent a large sum of money in putting the place into thorough decorative repair. Mr. O'Brien spent 1,100L. entirely in decorative repair. He was anxious to and succeeded in making it an exceedingly comfortable house, and he spent some 1,500L. in furnishing it. Mr. O'Brien lived there till 1900. At the end of 1900 the tube railway came along directly underneath the stables and part of these premises. Soon after a subsidence occurred from the peculiar way in which the tube was constructed. In 1901 the people in the house noticed that something was going wrong. In 1902 Mr. Douglas Young, surveyor, visited the house to inspect it on behalf of the railway company, and Mr. Shiner examined it on behalf of the plaintiffs. From this time Mr. O'Brien began to suffer discomfort, and he complained to Mr. Shiner. The coachman, who lived in the stables, complained of the pictures shifting. In February the walls of the house began to show cracks, and the decorations became unsafe and fell, as well as the cornices. In April, 1903, Mr. O'Brien died, and after that things became worse than before. One of the walls went out of plumb. In December, 1903, the place got out of repair, and the Misses O'Brien went out of possession. In 1904 the surveyors came to the conclusion the place was unsafe for habitation. Long before that date the library and the billiard-room were abandoned because they were said to be dangerous. On December 18, the plaintiffs left. On January 18, 1904, a letter was written to the defendants asking them to inspect the premises before the contractors for the necessary work to the house commenced the contract. Miss O'Brien went to a flat, and in the meantime, Messrs. Wall, Ltd., proceeded to carry out the repairs. The work was finished in August last. When the work was begun it was found that the drains were wrong. In 1895 Mr. O'Brien had spent some 100L. in putting them right. The drains were found by the contractors to be in good order, but were broken in places below the joints, clearly the result of the subsidence of the ground. The joints were sound. The result was, that the plaintiffs had now had to spend 126L. on the drains. The contract price for the restoration of the house was 1,100L. Unfortunately, cracks were showing again in the new brickwork. The jury would see from the facts that the liability on the plaintiffs at the end of the lease would be very serious. The plaintiffs had been put to 450L. extra expense owing to the removal. Another item of compensation was the question of rental of the house. It had formerly been worth 120L. a year. Since the cracks the plaintiffs had tried to let it, but the only offer they could get was one of 90L. a year, the plaintiffs to put the house in thorough repair. In addition to this the plaintiffs claimed a substantial sum for the expenses they had incurred, and the discomfort they had experienced in being turned out. They also claimed something for possible structural injury in the future.

Mr. G. F. Deacon, a civil engineer, practising in George-street, Westminster, examined, said that on March 25, 1904, he paid the first of four visits to the house, 20, Highbury-crescent. He found numerous cracks due to apparent sinking. If the building was ever level it had gone down bodily several inches. The general result was that the sinking of the house was greater towards the part where the tunnelling was than anywhere else. He attributed the cracks to some displacement of the ground below, due, he thought, in this case, to the tunnelling for the tube line. He saw the drains when the ground had been opened up, and they were broken, evidently by an irregular movement of the ground. When they were relaid they put in iron pipes

to guard against damage from future movements of the ground. In his opinion, the clay not only sank immediately over the tube, but shifted on either side, drawing for some distance on either side the clay. The defendants had removed the lower half of the steel tube and filled it up with brickwork and cement. This would inevitably produce further subsidence.

Cross-examined, it was impossible to say how long these subsidences or movements of the clay would go on. Visible cracks, he thought, would go on in this house for about another year.

Mr. Wm. Woodward, A.R.I.B.A., examined, said that, on January 26, 1904, with Mr. Shiner, he had carefully examined the premises in question, and found a large number of cracks in the walls of the house. There were also fractures of the brickwork due to the action of the tube railway.

Mr. Shiner, A.R.I.B.A., examined, said he had formed the opinion that the damage to the house was by subsidence due to the construction of the tube railway. He plumbed the building and found it out of plumb 1'87 in., and that the building had fallen away towards the tube. The plaintiffs left the house because he advised them to do so as the house was unsafe.

Mr. Benjamin L'Anson Breach, of Messrs. Farebrother, Ellis & Co., Mr. C. R. Mitchell, F.R.I.B.A., Mr. Pidditch, Surveyor to the Board of Trade, Mr. Silvester, quantity surveyor, Mr. Barnett, and several other witnesses were called to prove that the subsidences were caused by the tube and to prove the damage to the premises.

At the close of the plaintiffs' case Mr. McCall, on behalf of the defendants, said the principle of the construction of a tube railway was to avoid the enormous claims which burdened the Metropolitan and Metropolitan District railways. It was to run the tunnel in the London clay in which there was no risk of meeting fissures, faults, or water. The danger arose from withdrawing water out of the strata. The ground would be then contracted and the foundations shaken. In the strata in which this tunnel was driven there was no water, and no sand or pockets of soft material were met with. While the Greathead shield was in position the tube was put in. Between the shield and the tube liquid cement was forced in under pressure. A segment of the tube was then taken out and had a foundation of grouting or liquid cement put in its place. It was said that the exposed end of the shield was without support, and that movement could take place there. It had been found by experiment that that was not so. One thing was always to be remembered—subsidence only followed removal. If there was substituted for what was taken out an exact amount of substituted material, no subsidence could take place. In the present case the only portions of the premises over the tube had nothing wrong with them. The places that were affected were affected before the tube went there. He submitted that the case had been grossly exaggerated because it was a railway company which had to pay.

Mr. Basil P. Everett, examined, said he was an engineer in charge of the works during the construction of the line. The tunnels were laid entirely in the London clay, and there was no water. They started grouting within two or three minutes of the shield going forward. The cement was forced into the space by pneumatic pressure of 60 lb. per sq. in. The cement in setting expanded into the crevices of the clay and compressed the clay. They found on inspection when they opened up a part of the tube under Hornsey Fields that there was 2 in. of grouting. He had made tests and there was no movement on the exposed surface of the clay. There was no difficulty in setting the brickwork at the bottom of the tube, and that showed there was no movement.

Cross-examined, he had no qualifications as an engineer. There was no excavation by the men in front of the shield. They used lime for grouting. The Act said that they should use cement. The grouting might contract when it cooled. They removed the lower sections of the tube from three to twelve months after it was set in position. They then broke the grouting at the bottom, and then the clay was dug out 2 in. or 3 in., and then they put in 15 in. of brickwork. The top half at that time was standing without support under it. No concrete was put under the bricks. Every week-end they put up timbering at the exposed end of the clay. If it was exposed long enough there was a chance of movement.

Mr. Douglas Young, F.S.I., Mr. Gruning, F.R.I.B.A., Mr. Chatfield Clarke, and Mr. Leslie Vigers, architects and surveyors, gave evidence to the effect that the house contained indications of old faults and cracks, and that

the movement was due to the nature of the upper clay, and not to the tube, which was driven into the lower London clay.

Other evidence was given with a view to showing that the latent value of houses in Highbury-crescent was diminishing.

In summing up the case to the jury, his lordship said the question for determination was whether the house was injuriously effected by the making of the tube, and, if so, what were the damages.

In the result, the jury returned a verdict for the plaintiffs for 2,000 damages, and judgment was entered accordingly.

WORKMEN'S COMPENSATION ACT:

QUESTION AS TO "ABOUT."

DEPUTY-JUDGE CLEMENT LLOYD, last Friday, at the Brompton County Court, delivered judgment in the case of *Saunders v. Lole & Lightfoot*, reported in the *Builder*, January 14 last.

In the first instance, the plaintiff, Edward Saunders, carpenter and joiner, living at Croydon, sought to recover damages, under the Employers' Liability Act, from Messrs. Lole & Lightfoot, builders and contractors, Trafalgar-square, Manresa-road, Chelsea, S.W., in respect of personal injuries. The jury, however, on that occasion, found that negligence was not proved against the defendants nor against anyone to whose orders the plaintiff was bound to conform. It appeared that a van, standing outside the defendants' yard, had been loaded with joiners' work, and that the plaintiff, in accordance with the foreman's directions, got into the back of the van to go to the City to fix the work. Suddenly the horse, getting beyond the driver's control, swerved completely round and bolted up the street, throwing the plaintiff into the road.

Having failed under the Employers' Liability Act, the man applied for compensation under the Workmen's Compensation Act. In opposing this application, Mr. W. Shakespeare, counsel, submitted that, when the applicant was in the loaded van and ready to start, his connexion with the workshop or "factory" had ceased to exist. To be "about" a workshop a man must not only be in physical contiguity with it, but also engaged in the regular work of the shop. A man could not carry the protection of the Act with him when he left the workshop or "factory" premises, and when his "factory work" had ceased.

His Honour, after recapitulating the evidence, said the question which he had to decide was, whether the man sustained his injuries whilst engaged in the respondents' work "in, on, or about" a factory. It was admitted by counsel for the respondents that his clients' workshop was a "factory" within the meaning of the Act. His Honour thought he was justified in finding, on the evidence, that the van had not really started on its journey to the City, but was in proximity with the workshop when the accident happened. He quite agreed with the contention that mere physical proximity with the factory would not entitle the applicant to succeed; but, in the present case, it appeared, the applicant had just finished helping to load the van—so far engaged in the business of the factory—and got into the van in obedience to the orders of the foreman—all in close proximity with the workshop, or factory. That being so, he thought he would be justified in finding in favour of the applicant. The man's wages had been 2*l.* a week, and his Honour assessed the compensation at 1*l.* a week so long as total incapacity might continue.

Costs were allowed the applicant, to be set off against the costs of the other side in the Employers' Liability Act proceedings.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

8,614 of 1904.—R. E. PEARSE and R. E. PEARSE & Co., LTD.: *Casements*.

A casement, which consists in the construction wherein the length of the end members of the intermediate frame is such that the sash is balanced, and the width of said sash is such that when the intermediate frame and sash are swung inwards, the outer edge of the sash intersects the plane of the main frame.

22,510 of 1904.—J. M. NEWALL: *Fastenings for Doors, Windows, or the like*.

A fastening for doors, windows, or the like, comprising a pivoted arm carrying a sliding bolt, a guide with which said bolt is adapted to engage, means for securing said bolt upon its arm, and means whereby said bolt is prevented from accidentally disengaging from the guide.

*All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

23,547 of 1904.—A. CLINCH: *Fowlhouse*.

This invention consists in the use of a tray constructed of strips of wood, wire netting, or other suitable material, on a frame, which shall slide into the house. Under this tray slides another tray or drawer, constructed of board, or galvanised iron, or other suitable material, to receive the excrement falling through the first tray. The trays may be inserted at an elevation; in this case the under tray may be so inserted as to form an incline down which the excrement may roll into a trough below, or the tray may be in two parts, meeting in the middle of the house like an inverted V, and falling to each side, and having a trough on each side.

24,712 of 1904.—L. F. KWIATKOWSKI: *Process of Making Bricks, Artificial Stone, and Similar Products*.

A process of producing artificial stone or brick from a composition including lime and sand, consisting in simultaneously incorporating and pulverising the entire quantity of unslaked lime and part of the sand in its natural moist state, whereby the lime is partially hydrated and the moisture in the sand thereby absorbed and the ingredients thoroughly mixed and intermixed, thereafter adding the remaining quantity of sand in its natural state, together with sufficient moisture to complete the hydration of the lime, intermixing the ingredients, then moulding said mixture, and thereafter subjecting same to the action of superheated "salts-impregnated-steam" under pressure.

29,320 of 1904.—T. A. H. CROMPTON and GEORGE HOLLOWAY & WEBB, LTD.: *A Foldable Table*.

A foldable table, comprising a table top having an underframe, consisting of flat end supports hinged to the ends of the underframe so as to be adapted to fold flat thereagainst, and to be set at right-angles thereto, and hinges to the intermediate parts of the underframe so as to be adapted to fold into the plane thereof, so as to be set at right-angles thereto, and to the end supports when the supports are set at right-angles to the underframe, and then to strut the supports apart, and means enabling, respectively, the strut to be secured in the strutting position, and the end supports to be secured in their folded positions.

8,257 of 1904.—T. H. ROCHFORD: *Indicating Apparatus for Street Fire Hydrant Boxes and the like*.

The object of this invention is to provide means to enable a person to locate rapidly a street or other hydrant in case of fire. This invention consists in having the hydrant cover made with a recess or sunken space of suitable size in or on the upper face or surface of the cover. Into this recess or sunken space a tile or tablet of suitable material, construction, and size, is fixed or fastened with composition or cement flush with the face of the cover. This tile is preferably of a white colour, with such a word as "Fire," "Fire Hydrant," "Plug," burned or let into it in red or vermilion letters. The tile with the lettering on it can easily be seen, particularly when it rains, as it shows up conspicuously from the street or pavement. The cover can, in the usual hinged way, be raised back, and the standpipes attached.

8,436 of 1904.—A. GRAY: *Roofs, Light Floors, Dormers, Ceilings, and the like*.

Roofs, light floors, dormers, ceilings, and the like, consisting in making terra-cotta clay-iron or other fire-resisting slabs, having a base of greater width than the top surface, so that on their being fitted to the metal joists a space shall be left between the slabs, into which space a material can be placed into which nails can be driven for securing battens thereto.

8,690 of 1904.—W. C. STEWART: *Pickaxes*.

A pickaxe or like tool, which consists in interposing between the eye of the pick and the haft or shaft a tapered metallic ferrule or shield, constructed in halves and long enough to extend some distance below the head, and the separate halves of the said ferrule or shield being secured thereto.

8,948 of 1904.—H. R. ANTCLIFF: *A Self-locking Mechanism for Safes and Strong-rooms*.

Self-locking mechanism for safes and strong-rooms, which consists in the use with a lock of ordinary or suitable construction, and provided with suitable release mechanism such as a trigger and release piece, of a sliding bar and tension plate, in one with the carrier bar, and bolts provided with a striking portion or projection, and a cutaway portion of the bolt of the reception plate being the lock, the said extension plate being operated from the safe handle by a follower, against springs, and released by the

action of a bolt provided with a bevelled contact end taking against the adjacent safe framing and cutaway portion for engagement with a pin on the carrier bar.

2711 of 1904.—T. C. SOMERVILLE: Means for securing Roofing Slates and the like.

Means for securing roofing slates and the like, consisting of a screwed bolt, part of the head of which is shaped to enable it to be slid up between the fixed slates with its head engaging with the underside thereof, in combination with a washer or disc, having a lip or stop against which the loose slate rests when the washer is screwed down upon and clamped to the fixed slates by a nut.

28461 of 1904.—T. W. MAY: A Flushing Apparatus for Water-closets and the like.

A flushing apparatus for water-closets and the like, consisting in the combination of an inlet pipe connected to a water main, a chamber communicating with the inlet pipe, an elbow having a hole communicating with the chamber, a pipe connected to its lower end to the elbow, a closed water tank connected to the top of the said pipe, a casing having a hole communicating with the chamber, and another hole communicating with the elbow, a valve face on the end of the valve, an outlet pipe from the casing having a valve seat and communicating with the pan of a closet, a tap for releasing water from the closet, a tap for delivering the released water to the outlet pipe, and means for operating the tap.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

March 3.—By FORBES & WILDERESS (at Driffield).

Middleton-on-the-Wolds, Yorks.—Middleton Grange Farm, 175 a. 3 r. 1 p. 1, w. r. £3,600

By FRANKS & SONS (at Southampton).

Hamble, Hants.—Four freehold building sites and eleven cottages (in lots). 2,210

March 4.—By J. M. & R. BALLS.

Stile Heddingham, Essex.—Heddingham Gas Light Works, 1. 690

By Wm. HODGKINSON.

Walthamstow.—8 and 10, Byron-rd., 1, w. r. 220

281. 18s.

Romney.—123, Finborough-rd., ut. 59 yrs., gr. 14, p. 400

By G. E. LUCE.

Highgate.—Horsely-la., "Rodsan," ut. 55½ yrs., gr. 32, 17s. 6d., y. r. 150L. 1,505

By WOOTTON & GREEN.

Walthamstow.—East-hill, freehold rent charge 18s. 6d. 450

Nothing Hill.—St. Mark's-rd., f.g. rents 12L, reversion in 50 yrs. 335

Talbot-rd., f.g. rents 40L, reversion in 50 yrs. 1,150

St. George's-rd., f.g. rents 12L, reversion in 50 yrs. 835

By VENTON, BELL, & COOPER (at Selby).

Dringworth-the-Mash, Yorks.—"Hawthorne House" and 1 a. 1 r. 36 p., ut. 65 yrs. 800

"Colchester Close," 3 a. 0 r. 37 p., c. 160

Two enclosures, 5 a. 3 r. 29 p., f. and c. 315

"Golden Field," 25 a. 2 r. 31 p., f. and c. 1,000

Two enclosures, 8 a. 0 r. 18 p., c. 380

"Holy Croft Enclosure," 11 a. 2 r. 33 p., c. 510

By G. W. DAVIES & SON.

Blonbury.—10, Heathcote-at., ut. 15½ yrs., gr. 4, 1s. 4d., r. 68L. 350

Edling.—3, Oldenham-villas, ut. 74 yrs., gr. 6, 1s. 4d., r. 82L. 860

6, Langdon-rd., ut. 68 yrs., gr. 5L 6s., y. r. 200L. 325

March 7.—By DEBBENHAM, TAYLOR, & CO.

City.—50, Bishopsgate-st. Without (s.), area 500 ft., y. r. 150L. 3,900

St. Paul's-rd., ut. 68 yrs., area 600 ft., y. r. 175L. 4,450

West Ham.—Glenparke-rd., f.g. rents 50L, reversion in 54 yrs. 1,150

By DRIVERS.

Holloway.—33, Arthur-rd., ut. 57½ yrs., gr. 6, 1s. 4d., r. 45L. 405

53, Engdown-rd., ut. 58 yrs., gr. 6L 6s., r. 22L. 285

Harvey Hill.—50, Corby-st., ut. 65 yrs., gr. 6L 6s., r. 30L. 280

Regent Park.—25, Park-rd. (a.), ut. 17 yrs., gr. 12, y. r. 65L. 445

By NOKES & NOKES.

Forest Hill.—1, Benson-rd., f. e. 40L. 530

Kensington.—51, Rydal-st., ut. 44½ yrs., gr. 4, y. r. 40L. 340

March 8.—By ELLIOTT, TOMES, & CO.

Paddington.—17, Blomfield-st., ut. 46 yrs., gr. 11. 18s., y. r. 60L. 570

Notting Hill.—18, Tavistock-rd., ut. 58½ yrs., gr. 10L, y. r. 60L. 525

Paddington.—9, Desborough-st., ut. 48½ yrs., gr. 4, y. r. 55L 18s. 250

By FIELD & SONS.

Deodar-rd.—27, Lynton-rd., ut. 44 yrs., gr. 6, y. r. 23L 18s. 200

By MORLEY & JOHNSTON.

Harlow.—4, Hamlet-rd., ut. 53 yrs., gr. 12. 18s., p. 550

Essex, Surrey.—7, Amber Park-rd., f. e. 50L. 590

By J. C. PLATT (on the premises).

Chiswick.—5, South-parade, f. e. 65L. 750

March 9.—By HENRY H. COLLIER.

City of London.—53, Fleet-st., area 1,054 ft., building lease for 99 yrs., let at per annum. 520

Hammer-smith.—32 and 34, Stove-rd., ut. 70½ yrs., gr. 12L, y. r. 61L. 720

By CHAMBERS, GIE, & FORD.

Old Ford.—5, Ellesmere-rd., f. w. 39L. 4410

By J. G. DEAN & CO.

Balham.—94, St. James's-rd., f. y. r. 40L. 760

9, Althorp-rd., f. e. 48L. 675

By DAYDALE, NURSE, & CO.

Islington.—Copenhagen-st., etc., f.g. rents 20L, ut. 38½ yrs., gr. 2L 6s. 290

By G. TROLLOR & SONS.

Oxford-street.—36½, Jauncey-st. (partly erected), f. p. 2,875

Chelsea.—26, Sloane-gdns., ut. 68½ yrs., g.r., etc., 55L 6s., p. 5,000

By WALTER VINCKY.

Kilburn.—15 and 23, Albert-rd., ut. 54½ yrs., gr. 10L 10s., w. r. 96L 4s. 530

Clerkenwell.—32, Bowling Green-ls. (s.), y. r. 50L; also four peppercorn ground rents, ut. 28½ yrs., gr. 6L. 400

29 and 31, King's Cross-rd., f. w. 183L 18s. 1,200

By C. C. & T. MOORE.

Old Ford.—39, 41, and 43, Hewlett-rd., ut. 53½ yrs., gr. 10L 15s., w. r. 82L 8s. 715

Bethnal Green.—21, Hague-st., f. w. 22L 2s. 180

Stepney.—97, 99, and 101, Eastfield-st., f. w. 78L

Commercial East.—31 to 45 (odd), Buxton-st., ut. 15½ yrs., gr. 14L, w. r. 262L 12s. 810

Brixton.—8, 9, and 10, Clarendon-rd., ut. 9 yrs., gr. 12L, y. r. 100L. 300

Camden Town.—11 and 12, Little Randolph-st., ut. 18 yrs., gr. 12L, y. r. 68L. 265

By SIMSON & SONS.

City of London.—1 to 5, Addehill; 6, 7, 8, and 10, Wardrobe-pl. (s.), freehold rental of 506L. 11,700

Nevington Butts.—No. 123 (s.), f. y. r. 75L. 1,420

No. 153 (s.) f. y. r. 120L. 2,475

2, 4, 6, and 8, Hurbutt-pl., f. w. 123L 10s. 980

Whetstone.—Oakley-pk. South, "Highlands," f. p. 2,050

Malton, Essex.—Bank premises (Bank premises, etc.), f. y. r. 92L 10s. 2,025

Farnbridge-rd., freehold arable land, 8 a. 2 r. 30 p. 280

March 10.—By DOLMAN & FRANK.

Hampstead.—5, 6, and 7, Willow-rd., f. e. r. and y. r. 285L. 4,600

Worsley-rd., a freehold building plot. 210

Denning-rd., f.g. 18s., reversion in 77 yrs. 505

Tottenham.—Elmar-rd., f.g. rents 288L 10s., reversion in 75 yrs. 7,485

Hampstead-rd.—49, William-st., ut. 19½ yrs., gr. 27L, y. r. 81L 18s. 180

Kensal Town.—159, Prince of Wales-rd., ut. 40 yrs., gr. 7L, ex. 45L. 390

By JONES LLOYD & CO.

Willesden.—81 and 83, Vicarage-rd., f. y. r. 60L. 965

Chislehurst, Kent.—2, Church-row, ut. 35½ yrs., gr. 5L, y. r. 48L. 400

Teddington, Middlesex.—Waldegrave-rd., f.g. rents 50L, reversion in 89 yrs. 960

Contractions used in these lists.—F.g. for freehold ground-rent; l.g. for leasehold ground-rent; f.g. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y. r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; glds. for gardens; yd. for yard; gr. for grove; h.h. for hearthstone; p.h. for public-house; o. for office; s. for shops; ct. for court.

MEETINGS.

FRIDAY, MARCH 17.

Institution of Mechanical Engineers.—Paper to be read and discussed: "First Report to the Steam-Engine Research Committee," by Professor David S. Capper. 8 p.m.

SATURDAY, MARCH 18.

Royal Institution.—Professor J. J. Thomson, LL.D., D.Sc., on "Electrical Properties of Radioactive Substances," II. 8 p.m.

Incorporated Association of Municipal and County Engineers.—Yorkshire District Meeting at Cleckheaton.

MONDAY, MARCH 20.

Royal Institute of British Architects.—Sir William Richmond, R.A., Mr. Alfred East, A.R.A., and Mr. Solomon J. Solomon, R.A., on "Decorative Painting." 8 p.m.

Surveyors' Institution (Junior Meetings).—Paper by Mr. R. G. G. Reed. 7 p.m.

Liverpool Architectural Society.—Mr. Frank Rimington on "Small Houses of To-day." 6 p.m.

Society of Arts (Lecture).—Mr. H. Laws Webb on "Telephone," II. 8 p.m.

TUESDAY, MARCH 21.

Royal Institution.—Professor W. E. Dalby, M.A., on "Engineering Problems," I. 8 p.m.

Society of Arts (Applied Art Section).—Mr. F. Bligh Bond on "West Country Screens and Rod Lotts." 8 p.m.

Mr. G. P. Bodley, R.A., will preside. 8 p.m.

Institution of Civil Engineers.—Paper to be further discussed: "Shipbuilding for the Navy," by Lord Brassey, K.C.B., Assoc. Inst. C.E. 8 p.m.

WEDNESDAY, MARCH 22.

Architectural Association (Discussion Section).—Mr. A. E. Mulvey, M.A., on "An Information Bureau on the Products of the Building Trade." 7.30 p.m.

Edinburgh Architectural Association.—Paper by Mr. J. Wilson, entitled "Practical Notes on Beams for Architects," illustrated by lantern slides and diagrams. 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Quarterly Meeting of the Directors. 8 p.m.

THURSDAY, MARCH 23.

Carpenters' Hall, London Wall (Free Lectures on Matters Connected with Building).—Professor W. B. Fisher, B.A., on "The Cultivation of Oak, Ash, Beech, and other Hardwood Trees in the British Isles." 8 p.m.

Society of Antiquaries.—8.30 p.m.

Leeds and Yorkshire Architectural Society.—Mr. Percy S. Worthington, M.A., on "Past Tradition and Modern Design." 6.30 p.m.

Institution of Electrical Engineers.—Discussion on (1) Report of experiments carried out at the National Physical Laboratory "On the Effect of Heat on the Electrical and Mechanical Properties of Dielectrics," and "On the Temperature Distribution in the Interior of Field Coils," by Mr. E. H. Rayner, M.A., communicated by Dr. R. T. Glazebrook, F.R.S. (2) "On Temperature Curves and the Rating of Electrical Machinery," by Mr. R. Goldschmidt. 8 p.m.

FRIDAY, MARCH 24.

Architectural Association.—Mr. A. Needham Wilson on "Sketch Plans and Working Drawings." 7.30 p.m.

Royal Institution.—Professor G. H. Bryan, F.R.S., on "The Coming Renaissance of Mathematics," illustrated. 9 p.m.

Institution of Civil Engineers (Students' Meeting).—(1) "The Wand to Victoria Falls Section: Victoria Falls Railway," by Mr. G. T. Gardner; (2) "Design of a Double-line Plate-girder Railway Bridge," by Mr. H. S. Coppock. 8 p.m.

SATURDAY, MARCH 25.

Edinburgh Architectural Association.—Visit to Inveresk and Musselburgh.

Royal Institution.—Professor J. J. Thomson, F.R.S., on "Electrical Properties of Radioactive Substances," III. 8 p.m.

Foremen's Association.—Mr. F. Jay on "Concrete." 8.30 p.m.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications. No notice can be taken of drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

PRICES CURRENT OF MATERIALS.

* Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.	
£ s. d.	
1 12 0	per 1000 alongside, in river.
Hard Stocks	" "
2 8 0	" "
Grizzles	" "
1 8 0	" "
Facing Stocks	" "
2 5 0	" "
Shippers	" "
1 8 0	" at railway depôt.
Flintons	" "
1 14 0	" "
Red Wire Cuts	" "
Best Farnham Brick	" "
Best Red Pressed	" "
Shannon Facing	" "
5 0 0	" "
Best Blue Pressed	" "
Staffordshire	" "
4 4 0	" "
Do. Bullnose	" "
4 10 0	" "
Best Stourbridge	" "
4 8 0	" "
Fire Bricks	" "
GLAZED BRICKS.	
Best White and	" "
8 p.m.	" "
Ivory Glazed	" "
Stretchers	" "
12 0 0	" "
Headers	" "
11 0 0	" "
Quoins, Bullnose,	" "
and Flats	" "
16 0 0	" "
Double Stretchers	" "
19 0 0	" "
Double Headers	" "
16 0 0	" "
One Side and two	" "
Ends	" "
19 0 0	" "
Two Sides and	" "
one End	" "
20 0 0	" "
Spalls, Cham-	" "
ferred, Squints	" "
20 0 0	" "
Best Dipped Salt	" "
Glazed Stretch-	" "
ers, and Header	" "
12 0 0	" "
Quoins, Bullnose,	" "
and Flats	" "
14 0 0	" "
Double Stretchers	" "
15 0 0	" "
Double Headers	" "
14 0 0	" "
One Side and two	" "
Ends	" "
15 0 0	" "
Two Sides and	" "
one End	" "
15 0 0	" "
Spalls, Cham-	" "
ferred, Squints	" "
14 0 0	" "
Second Quality	" "
White and	" "
Dipped Salt	" "
2 0 0	" less than best."
Thames and Pit Sand	7 0 per yard, delivered.
Thames Ballast	5 9 "

LEAD, &c. (continued).—

	Per ton, in London
Strong Sheet.....per lb.	8 s. d.
Thin.....	0 10 "
Copper nails.....	0 10 "
Bar.....	0 10 "
Strong Sheet.....	0 0 9 1/2 "
Thin.....	0 0 10 "
Three-English Ingots.....	0 1 1/4 "
Scrap.....	0 1 1/4 "
Timmen's.....	0 0 9 1/2 "
Blowpipe.....	0 0 9 "

ENGLISH SHEET GLASS IN CRATES.

	22d. per ft. delivered
15 oz. fourths.....	24d.
21 oz. fourths.....	33d.
26 oz. fourths.....	42d.
32 oz. fourths.....	53d.
Fluted Sheet, 15 oz.....	33d.
Hardy's Rolled Plate.....	45d.
1 1/2.....	24d.
1.....	24d.

OILS, &c.

	per gallon
Raw Linseed Oil in pipes.....	1 1/2
" " in barrels.....	1 1/2
Boiled.....	1 1/2
" " in pipes.....	1 1/2
" " in barrels.....	1 1/2
Turpentine.....	1 1/2
" " in drums.....	1 1/2
Genuine Ground English White Lead.....	19 1/2
Best Lead, Dry.....	18 1/2
Best Linseed Oil.....	per cwt. 0 1/2
Stockholm Tar.....	per barrel 1 1/2

VARNISHES, &c.

	Per gallon
Superfine Pale Oak Varnish.....	0 8
Pale Copal.....	0 8
Superfine Pale Elastic Oak.....	0 14
Fine Extra Hard Church Oak.....	0 13
Superfine Hard-drying Oak, for seats of Churches.....	0 13
Fine Elastic Carriage.....	0 13
Superfine Pale Elastic Carriage.....	0 13
Fine Maple.....	0 18
Finest Pale French Oil.....	1 1/2
Extra Pale French Oil.....	1 1/2
Eggshell Flattening Varnish.....	1 1/2
White Copal Enamel.....	0 12
Extra Pale Yellow.....	1 1/2
Best Japan Gold Size.....	0 19
Best Black Japan.....	0 16
Oak and Mahogany Stain.....	0 8
Best Black Glass.....	0 8
Berlin Black.....	0 15
Knotting.....	0 10
French and Brush Polish.....	0 12

TERMS OF SUBSCRIPTION.

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TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach not later than 10 a.m. on Thursdays. [N.B.—We cannot publish Tenders unless authenticated either by a professional architect or the building-owner, and we cannot publish tenders of Contractors of Tenders unless the name of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional case, and for special reasons.]

* Denotes accepted. † Denotes provisionally accepted.

ABERYSTWYTH.

For completing the new and building a tower at St. Michael's Church, near the Nicholaston & Hartree, architect, Treasurers—

Bastow, &	£5,012 8
Co.	£7,808 7 11
E. de Jenkins	£7,808 7 11
Jones & Sons	£7,236 2 6
E. Owen	£6,754 5 6
C. Cooke	£6,636 11 10
W. J. Ed-wards	£6,392 3 6
Beaven &	£6,347 6 8
Hodges	£6,347 6 8
Edward Bro-	£6,347 6 8

† Modified tender accepted.

AINWICK.

For storage tank, &c., for the Urban District Council. Mr. G. Wilson, Town Surveyor, Aynwick. Quantities by Surveyor—

For Storage Tank, capacity 12,000 gallons.

J. Whitham, Aynwick	£72 11 0
For 4-in. Water Main Extension, 180 yds.	£250
Reavell Bros., Aynwick	£215 7 1/2
For Three Street-watering Standposts and Branch Main.	£21 13 1/2
Reavell Bros., Aynwick	£21 13 1/2

ADDLEB.

For alteration of hunting stables, Wood-house-lane, for Baron de Truttschaker, Mr. Woodhouse, architect, 11, Bank-chambers, Newmarket—

J. Williams & Sons	£730 0 0
S. Manley	£665 0 0
Wright & Son	£600 0 0
Orchard & Son	£500 0 0
Wood & Sons	£590 0 0
T. Bealey	£590 0 0

H. Truttschaker, Mr. Woodhouse, architect, 11, Bank-chambers, Newmarket	£730 0 0
J. T. Gresty	£655 0 0
G. T. Gresty	£655 0 0
G. T. Gresty & Gibson	£491 10 0
T. L. Kendall	£491 10 0
W. Mould, Trent	£491 10 0
Ham	£491 10 0

LONDON.—For the erection of factory premises at Montford-place, Kennington, for Messrs. Hayward Bros., Ltd. Mr. A. W. Tribe, architect, 120, Clapham-road, S. W. :—

G. Brittain	£1,495	Hilberd Bros., Ltd.	£1,450
G. Hoare & Sons ..	1,489	F. & H. P. Riggs...	1,423
W. Smith & Son ..	1,475	Rice & Son*	1,383
J. Parsons.....	1,474		

TENDERS.—Continued on page 311.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered
*Plans for Public Elementary School	Swindon Education Committee	5 per cent. commission	April 14
*Proposed Technical Institute	Rochester Corporation	50, 20, and 10 Guineas	May 15

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Mortuary and Urinal, Portugal-place, Wallsend	The Corporation	G. Hollings, Borough Surveyor, Corporation Offices, Wallsend ..	Mar. 23
Tramway Castings, etc.	Birmingham Works Committee	J. Price, City Engineer, Council House, Birmingham	do.
Road Materials	Claypole R.D.C.	C. D. M. Trinder, District Surveyor, Brant Broughton, Newark ..	do.
Engine & Boiler Houses, Chimney & Setting Boilers	Bury Guardians	A. Hopkinson, Architect, 15, Agar-street, Bury	do.
Stores	Frome U.D.C.	F. W. Jones, Engineer, Public Offices, Frome	do.
Water Closets and Urinal in Cemetery Grounds	Armsley Burial Board	Registrar at Cemetery, Hill Top, Armsley	do.
Road Material	Glasgow Corporation	Office of Public Works, City-chambers, 64, Cochran-st., Glasgow ..	do.
Laying-out, etc., Playground at Mountfort street	Mr. B. W. Stedham	No. 23, Market-street, Torquay	do.
Residence at Livermead, Torquay	Steel Superstructure of Bridge at Bristol	Engineer, Paddington Station, London	Mar. 21
Scavenging	Caerphilly U.D.C.	A. O. Harpur, Surveyor, Council Offices, Caerphilly	do.
Broken Limestone and Granite Metalling	do.	do.	do.
Materials	Maldon R.D.C.	E. J. Ennals, Surveyor, 6, Market-hill, Maldon, Essex	do.
*Roadmaking, Sewering, and Eaving Works	Bromley Borough Council	Bromley Engineer, Bromley, Kent	do.
Granite and Slag	Northamptonshire C.C.	C. S. Morris, County Surveyor, County Hall, Northampton	do.
Carting	do.	do.	do.
House, Garbity, N.B.	Mr. Dean	10, Seaford-square, Rothes	do.
Motor First-Aid Machine	Glasgow Corporation	Chief Officer Fire Brigade, Central Fire Station, Ingram-st., Glasg W	do.
Motor Fire Engine	do.	do.	do.
Extension Fire-Escape Ladder	do.	do.	do.
2,200 lineal yds. of Pipe Sewer, Ballyholme	Bangor U.D.C.	E. L. Woods, C.E., Town Surveyor, Town Hall, Bangor, Co. Down ..	do.
Two Public Lavatories	do.	do.	do.
Painting, etc., of Gwerilley's Chapel, Dowlaish	Derby Tramways Committee	M. Lloyd, 54, Mary-street, Derby	do.
Materials and Construction for Permanent Way, etc.	do.	J. Ward, Borough Surveyor, Derby	do.
Cars	Great Western Railway Co.	T. P. Wilmshurst, Borough Electrical Engineer, Derby	do.
*Office Accommodation at Paddington Station, W.	Willesden District Council	Engineer's Office, Paddington Station, W.	do.
*Wool Paving	do.	Council's Engineer, Dyne-road, Kilburn, N.W.	do.
Pair Semi-Detached Villa Residences, etc., Idle	East India Railway Co.	J. Harper Bakes, Architect, Calverley-chbrs., Victoria-sq., Leeds ..	Mar. 22
Dressing Shed, Perseverance Mills, Wibsey	Matlock U.D.C.	Braxshaw & Dixon, Architects, etc., Bowling Old-lane, Bradford ..	do.
Four Deck Spans	Hathorn, Davey & Co., Ltd.	C. P. Foster, Tramway Engineer, Town Hall, Matlock	do.
1,907 lineal yds. of Steel Wire Tramway Cable	Easingwold R.D.C.	S. E. Smith, F.R.I.B.A., 12, South-parade, Leeds	do.
New Erecting Shop, Dewsbury-road, Leeds	Rochdale Corporation	F. J. H. Robinson, Clerk, Easingwold	do.
Whinstone and Slag	Shardlow R.D.C.	T. B. Hall, Manager, Gasworks, Rochdale	do.
Materials	do.	J. W. Newbold, Clerk, Beckett-street, Derby	do.
Scavenging, Normanton	do.	do.	do.
Scavenging, Littleover	do.	do.	do.
Scavenging, Sandiacre	Leeds Workpeople's Conval't. Home	C. Telford-Evans, Architect, 8, Queen-street, Cardiff	do.
Channel, Farish Church, Aberthaw	Hereford R.D.C.	J. Harper Bakes, Architect, Calverley-chbrs., Victoria-sq., Leeds ..	do.
Stabling and Wall, Springfield, Horsforth	Manchester Corporation	H. P. Froggatt, Surveyor, White Cross-road, Hereford	do.
Highway Tenders	do.	City Surveyor's Office, Town Hall, Manchester	do.
Stores	Preest Guardian	J. W. Hopkins, Ynystawe, Glydach-on-Tawe	do.
Setting Back Walls at Wilbraham-road Extension	Radcliffe U.D.C.	Topham, Jones & Ralton, King's Dock Works, Swansea	Mar. 23
*Hot-Water Heat Apparatus, Moriah Chap., Ynystawe	Commissioners of Irish Lights	W. L. Rothwell, Engineer, Council Offices, Radcliffe	do.
Hauling Stone to Danbyraig	Bridlington R.D.C.	Superintendent Irish Lights Stores, Kingstown, Ireland	do.
Enlarging Dining Hall at Walsoken	do.	J. S. Simpson, Clerk, Long-lane, Bridlington	do.
Sewerage Works in Dunsore Lane District	Glasgow Corporation	J. Dalrymple, 46, Bath-street, Glasgow	do.
Materials and Stores	Rhondda U.D.C.	W. J. Jones, Engineer, Public Offices, Pentre, Rhondda	do.
3,000 tons of Whinstone	Brixham U.D.C.	J. L. Arledge, Clerk, Town Hall, Brixham	do.
1,000 tons of Slag	Little Woolton U.D.C.	M. Warren, Clerk, Park House, Cardiff	do.
14-ton Lorry Chains for Tower Wags. for O'head Wk.	Landaff and Unnas Fowls R.D.C.	R. Simmons, Surveyor, Grange-lane, Gateacre, near Liverpool ..	do.
Road Macadam	Bishop of Shrewsbury	Topham, Jones & Ralton, King's Dock Works, Swansea	Mar. 24
Macadam	Henley & Wallingford Jt. Ho. Board	Myles Morley, Architect, Charlton House, Church-st., Wellington	do.
Joinery for Fitting-up 50 Cottages, King's Dock Wks.	Rhondda U.D.C.	C. Clements, Surveyor, 36, Market-place, Henley-on-Thames	do.
10-ton Compound Steam Road Roller, etc.	do.	W. J. Jones, Engineer, Public Offices, Pentre, Rhondda	do.
Catholic Church & Presbytery, King-st., Wellington	do.	do.	do.
Hospital, Nurses' Room, etc., Fishall, near Henley	do.	do.	do.
Street Works, Victoria-street, Treaslaw	do.	do.	do.
Private Street Works, Rhys-street, Treaslaw	do.	do.	do.
Street Works, Masseyflyn-road, Treaslaw	do.	do.	do.
Street Works, Dyfodling-street, Ystrad	do.	do.	do.
Street Works, Porth	do.	do.	do.
Street Works, Bailey-street, Ton	do.	do.	do.
Street Works, Dumfries-street, Treorchy	do.	do.	do.
Materials	Leek U.D.C.	W. E. Beacham, Surveyor, Town Hall, Leek	Mar. 25
Stores, Ironmongery, etc. (Electric Supply, etc., Dept.) ..	Irishich Corporation	F. Ayton, Engineer, Constantine-road, Ipswich	do.
Private Street Works, Clifton-street	Alderley Edge U.D.C.	H. Sheldon, Council Offices, Alderley Edge	do.
Road Materials	Driffield R.D.C.	T. C. Beaumont, C.E., Surveyor, Driffield	do.
Deep Lift Mine Pumping Engine	Huddersfield Corporation	J. W. Schofield, Waterworks Manager, Town Hall, Huddersfield ..	do.
Parish Institute for St. David's, Exeter	Repton R.D.C.	L. B. Reider, Architect, 12, Castle-street, Exeter	do.
Road Material and Cartage	Derby Guardians	T. H. Sidgwick, Surveyor of Highways, Repton, Burton-on-Trent ..	do.
Alterations to Vagrant Wards, Union Workhouse	Gower R.D.C.	F. C. Outhurst, Architect, 4, Albert-street, Derby	do.
Alters, etc., Ferndale Work. Men's Conservative Club ..	Ramsey U.D.C.	At the Club	do.
Stone Crushing	East Grinstead U.D.C.	R. F. Serjeant, Clerk, Ramsey, Hunts	do.
Granite	Waterloo-with-Seaford U.D.C.	W. E. Woolman, Engineer to Council, East Grinstead	do.
Materials	Gillingham Town Council	F. S. Yates, Surveyor, Town Hall, Waterloo	do.
Road Materials, etc.	do.	J. L. Reider, Borough Engineer, Corporation Offices, Gillingham ..	do.
Farmhouse, Woudle	do.	A. Steers, Architect, Aveton Gifford	do.
Fifty Cottages, Danbyraig, Swansea (Labour)	Gateshead Corporation	Topham, Jones & Ralton, King's Dock Works, Swansea	do.
Chapel at Abertridwr	Widnes Education Committee	G. A. Lundie, 53, Queen-street, Cardiff	Mar. 27
Enlargement of West Bank Council School	East and West Molesey U.D.C.	H. P. Patterson, Borough Surveyor, Town Hall, Gateshead	do.
Annual Contracts	Hull and Barnsley Railway	F. U. Holm, Arch., Westminster-chbrs., 1, Crosshall-st., Liverpool ..	do.
Four Houses, Whitehall, Hipperholme	Sowerby Bridge U.D.C.	Raymond Berry, Architect, Commercial-street, Halifax	do.
Extension of Cudworth Engine-shed	Rathmines and Rathgar U.D.C.	R. Fawley, Engineer, 9, Charlotte-street, Hull	do.
Stores and Remit	Leeds Gas Committee	Surveyor, Council Offices, Sowerby Bridge	do.
Condensing Plant	Caledonian Railway Co.	G. F. Pilditch, Engineer, Electricity Works, Rathmines	do.
Dry Gas Meters	do.	W. H. Cole, 1, Broad-street-place, Finsbury-circus, E.C.	do.
Renewal of Bridges—Steelwork Contract	do.	R. H. Townsley, Gas Officer, East-parade, Leeds	do.
		Company's District Engineer, 8, Gormiston-street, Glasgow	do.

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered
Parings, Kerbing, etc., New Road, etc., Ynyssybwl.	Mountain Ash U.D.C.	W. G. Thomas, Architect, Public Offices, Mountain Ash	Mar. 27
Passages and Dwelling-House, Park-place, Freggar.	Nuneaton and Chilver Coton U.D.C.	W. S. Williams, Architect, Freggar	do.
Private Street Works	Southwick U.D.C.	F. C. Cook, Surveyor, Council Offices, Nuneaton	do.
C.I. Water Mains, etc. (Waterworks to Woolacombe)	Ilfracombe U.D.C.	G. W. Warr, Surveyor, Council Offices, Southwick	do.
Additions to Cottages, Seaton Burn	Mr. T. Gibson	O. M. Prouse, Engineer, Town Hall, Ilfracombe	do.
Small Water Detached Villas, Ovenden	Chelsea Guardians	J. G. Crona, 21, Brainger-street West, Newcastle	do.
Annual Contracts	Gainsborough U.D.C.	W. C. Williams, Architect, 29, Southgate, Halifax	Mar. 28
Artificial Condenser, etc. (Electric Lighting)	Great Yarmouth Corporation	Clerk to the Guardians, 250, King's-road, Chelsea, S.W.	do.
Asphalt Road Material	Oxford Corporation	S. W. Parker, Engineer, Council Offices, Gainsborough	Mar. 29
Asphalt Road Material	Sutton (Surrey) U.D.C.	Freese & Cardew, Engns., 8, Queen Anne's-gate, Westminster, S.W.	do.
Asphalt Road Material	Cannock R.D.C.	C. Chambers-Smith, Engineer, Municipal Offices, Sutton	do.
Asphalt Road Material	Northumberland Education Comm.	H. M. Whitehead, Surveyor's Office, Penkridge, Stafford	do.
Asphalt Road Material	Fulham Borough Council	W. H. White, City Engineer, Oxford	do.
Asphalt Road Material	Willesden Guardians	J. A. Bean, County Surveyor, The Moorhall, Newcastle-on-Tyne	do.
Asphalt Road Material	Wood Green U.D.C.	Council's Engineer, Town Hall, Fulham, S.W.	do.
Asphalt Road Material	St. Mellons R.D.C.	A. Saxon Snell, Archt., 22, Southampton-bldgs., Chancery-lane, W.C.	do.
Asphalt Road Material	Chatham Town Council	Council's Surveyor, Town Hall, Wood Green	do.
Asphalt Road Material	Gravesend Corporation	J. Jones, Little Oak, Rogerstone, Newport, Mon.	Mar. 30
Asphalt Road Material	Southwark Union	C. Day, Borough Surveyor, Town Hall, Chatham	do.
Asphalt Road Material	Cheshire C.C.	F. T. Grant, Borough Surveyor, Town Hall, Gravesend	do.
Asphalt Road Material	Herne Bay U.D.C.	G. D. Stevenson, Architect, 13 and 14, King-street, E.C.	Mar. 31
Asphalt Road Material	Borough of Reigate Education Com.	H. F. Bull, County Surveyor, Chester Castle, Chester	do.
Asphalt Road Material	Rishworth U.D.C.	F. W. J. Palmer, C.E., Town Hall, Herne Bay	do.
Asphalt Road Material	Shrewsbury Estates Committee	Nicholson & Hartree, Architects and Surveyors, Hereford	do.
Asphalt Road Material	Sandwich Corporation	Municipal-buildings, Reigate, Surrey	do.
Asphalt Road Material	Chorlton Guardians	R. Horstall & Son, Surveyors, 22A, Commercial-street, Halifax	April 1
Asphalt Road Material	Aberdeen C.C.	W. Chapple Eddowes, Borough Surveyor, The Square, Shrewsbury	do.
Asphalt Road Material	Lewisham Borough Council	A. J. Pirby, Borough Surveyor, Sandwich	do.
Asphalt Road Material	Birmingham Tramways Committee	G. R. Peers, Engineer, 16, John Dalton-street, Manchester	do.
Asphalt Road Material	Leeds Guardians	J. Barron, Engineer, Central-chambers, 216, Union-st., Aberdeen	April 3
Asphalt Road Material	Sevenside R.D.C.	Surveyor's Department, Town Hall, Cardiff	do.
Asphalt Road Material	Mitcham & Wimb' on Dis. Gas L.C. Co.	A. Baker, 254A, Corporation-street, Birmingham	April 4
Asphalt Road Material	Metropolitan Asylums Board	J. H. Ford, Clerk, Poor Law Offices, South-parade, Leeds	do.
Asphalt Road Material	Howe Corporation	F. Fowler, Inspector of Nuisances, Longford, Sevenoaks	do.
Asphalt Road Material	Glasgow Corporation	Offices at the Works, Mitcham, Surrey	do.
Asphalt Road Material	Middleton Corporation	Office of the Board, Embankment, E.C.	do.
Asphalt Road Material	Corporation	Borough Surveyor, Town Hall, Hove	April 5
Asphalt Road Material	Cardiff Corporation	J. Dalrymple, 43, Bath-street, Glasgow	do.
Asphalt Road Material	Trustees of Clyde Navigation	W. Welburn, Borough Surveyor, Town Hall, Middleton	do.
Asphalt Road Material	Bromley & Beckenham Jt. Hos. Bd.	W. Hanstock & Son, Architects, Branch-road, Batley	do.
Asphalt Road Material	Worsley U.D.C.	C. H. Priestley, Waterworks Engineer, Town Hall, Northampton	April 6
Asphalt Road Material	St. Mellons R.D.C.	J. Ladds, Architect, 93, Pemberton-road, Harringway, N.	April 7
Asphalt Road Material	Trustees of Clyde Navigation	J. A. Corson, District Offices, Hilton-lane, Walkden	April 8
Asphalt Road Material	Bermansley Guardians	I. Thomas, Union Offices, Queen's Hill, Newport, Mon.	April 10
Asphalt Road Material	Mountain Ash U.D.C.	O. H. Baxter, Engineer, 16, Robertson-street, Glasgow	do.
Asphalt Road Material	Leeds Guardians	Guardians Offices, 283, Tooley-street, S.E.	April 13
Asphalt Road Material	Northamptonshire C.C.	W. G. Thomas, Architect, Public Offices, Mountain Ash	April 15
Asphalt Road Material	Aberystwyth Borough Council	J. Gott, Gillyard-parade, Morley	April 29
Asphalt Road Material	East Grinstead U.D.C.	Blair & Bova, Architects, 29, Park-st., Harrogate	No date
Asphalt Road Material	do.	J. H. Ford, Clerk, Poor Law Offices, South-parade, Leeds	do.
Asphalt Road Material	do.	C. S. Morris, County Surveyor, County Hall, Northampton	do.
Asphalt Road Material	do.	W. G. Peyton, 84, Colmore-row, Birmingham	do.
Asphalt Road Material	do.	Mr. Horton, George and Dragon Inn, Highington	do.
Asphalt Road Material	do.	J. Palliser, Philadelphia, Fence Houses	do.
Asphalt Road Material	do.	P. Hay, Bawdsey Estate Office, Woodbridge, Suffolk	do.
Asphalt Road Material	do.	W. E. Wooliam, Engineer to Council, East Grinstead	do.
Asphalt Road Material	do.	do.	do.
Asphalt Road Material	do.	J. P. Earle, Architect, Norfolk-row, Sheffield	do.
Asphalt Road Material	do.	Davidson & Philipson, 148, Aldersgate-street, E.C.	do.
Asphalt Road Material	do.	H. W. Pratt, Architect, 10, Sergeant's-lane, Fleet-street, E.C.	do.
Asphalt Road Material	do.	W. G. Tutt, 18, Ironmonger-lane, Cheapside	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Clerk of Works	Chertsey R.D.C.	34 3s. per week	Mar. 23
*Building Inspector	City of Coventry	130s. per annum	Mar. 25
*Public Surveyor	Tottenham U.D.C.	200s. per annum	Mar. 28
*Three General Foremen	Sierra Leone Government Railways	30s. per month	No date.

Those marked with an (*) are advertised in this number.

Competitions, iv.

Contracts, iv. vi. viii. x.

Public Appointments, xviii.

TENDERS.—Continued from page 309.

LIANDILO.—For a dwelling-house and cottage, with stable at George, for Mr. W. B. Jones, Llandilo. Mr. D. Jenkins, architect, Llandilo:—
W. Evans, Ammanford* £1,774 10

LIANFYDD.—For rebuilding farm-houses and out-buildings on Pantglas Estate, Carmarthenshire. Mr. D. Jenkins, architect, Llandilo:—
A. Jenkins, Brecon* £1,526

LLANGADOCK.—For alterations to Sardinia Congregational Chapel, for the Building Committee. Mr. D. Jenkins, architect, Llandilo:—
W. Thomas, Treanle, Breconshire* £1,183

LIANWRTYD.—For building a pair of semi-detached villas at Llanwrttyd Wells. Mr. D. Jenkins, architect, Llandilo:—
T. Barker, Bridgend, Llanwrttyd, estimated cost, £1,200

LONDON.—For the erection of a shop at Leyton, S.E. Mr. Herbert Biches, architect, 3, Crooked-lane, King William-street, London, E.C. Quantities supplied:—
C. J. L. & Co. £1,050 0
F. & T. Thorne 1,853 0
J. G. S. & Co. 1,813 0
Sons* 1,783 0

LONDON.—For external repairs and painting to "The Larch" public-house, Plaistow, E. Mr. Herbert Biches, architect, 3, Crooked-lane, King William-street, E.C.:—
A. W. Derby £104

LONDON.—For the formation of roads and sewers, Tottenham Fields Estate (Section C.), for the London County Council:—

Cunningham, Forbes, & Co. £9,224 11 8
W. Griffiths & Co., Ltd. 6,706 8 1
Mulhead, Greig, & Mathews 6,602 13 11
S. Kavanagh & Co. 2,217 8 7
J. Mowlem & Co., Ltd. 6,255 0 0
T. Adams 6,186 9 11
Martin, Wells, & Co., Ltd. 6,100 0 0
J. C. Trueman 6,068 0 0
W. Manders 6,012 14 0
W. Shepherd 5,803 7 0
E. Hes, Jun. 5,433
Laughey, Hardy, & Johnson 5,411 0 0
F. J. Coxhead 4,781 0 0
O. T. Gibbons, 11, Wallwood-road, Leytonstone 4,746 0 0
[The estimate comparable with the Tenders is £26,120.]

LONDON.—For the erection of stables at Greenmore Wharf, for the Southwark Borough Council. Mr. Arthur Harrison, Borough Engineer, Town Hall, Walworth-road, S.E.:—

Johnson & Co. £6,690 0 0
R. & F. Evans 6,417 0 0
Cliff, Ford, & Co. 6,374 0 0
Burman & Sons 6,290 0 0
J. Hoars 5,982 0 0
J. Marsland & Sons 5,979 0 0
W. J. Renshaw 5,891 0 0
W. Wallis .. £5,884 0 0
Wisdom Bros. 5,870 0 0
G. Neal 5,858 0 0
Holliday & Greenwood 5,816 0 0
Lid. 5,790 0 0
P. & H. F. Higgs 5,790 0 0
L. M. Coles 5,594 18 8
Plymouth 5,591 0 0

LONDON.—For alterations and additions to relief office, Mary Ann's-buildings, Deptford, for the Guardians of Greenwich Union. Quantities by Mr. Louis Jacob, Globe-chambers, 493, New Cross-road, S.E.:—
J. & A. Oldman .. £1,063
E. Mills 877
H. L. Holloway 847
C. Castle & Son 833
J. G. Gorham 829
W. G. Western 818
W. Martin 809
Staines & Son 795
W. Lawrence & Son £794
Hall Bros. 791
W. Mills 785
H. Groves 765
A. T. Peyton 750
W. Nash 727
S. D. Leng 694
Aldridge & Son 690

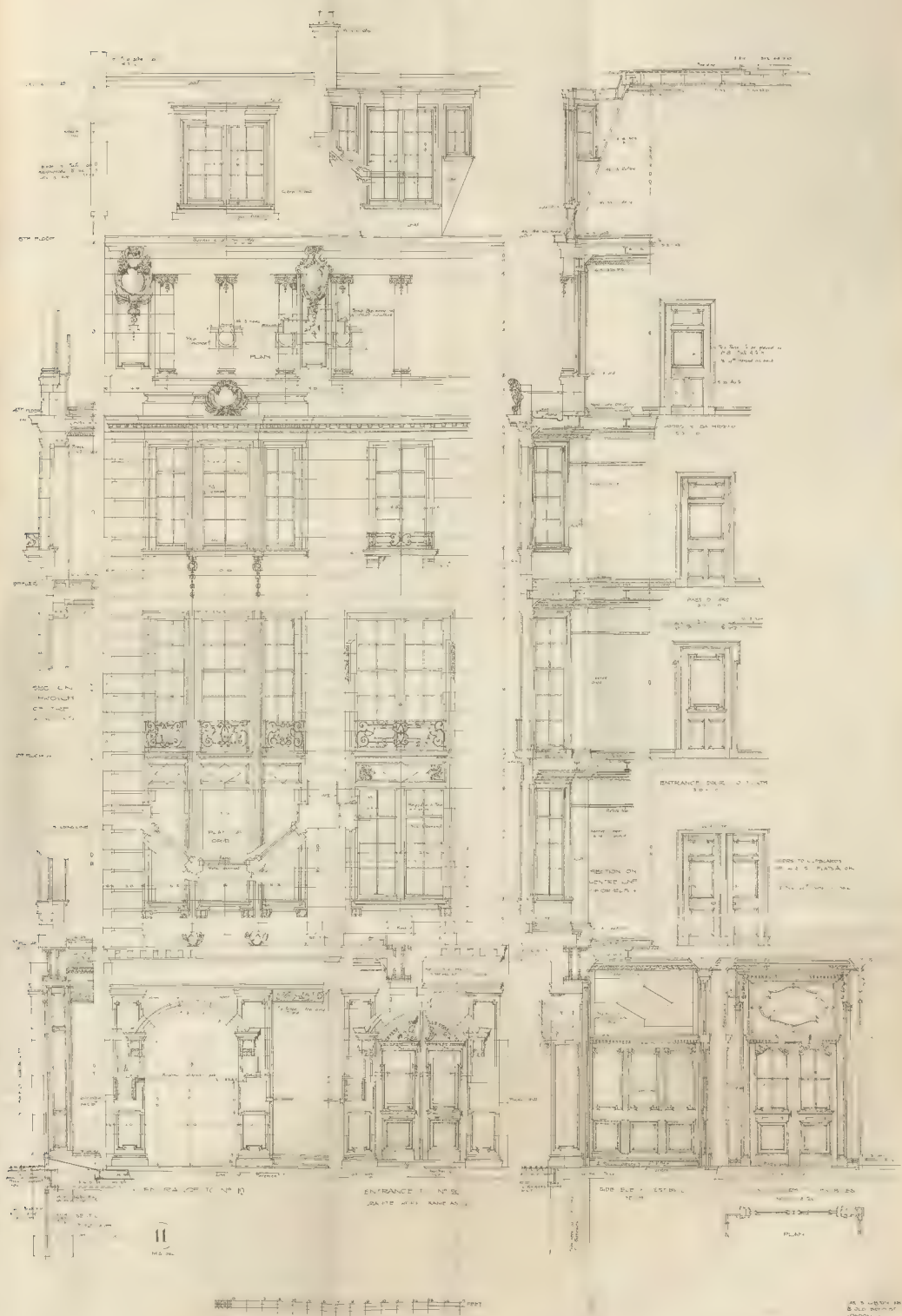
MAIDSTONE.—For painting work to the interior of the public swimming bath, for the Corporation. Mr. T. F. Bunting, Borough Surveyor, Maidstone:—
G. Chandler £147 5 2
Cook & Son 145 0 0
C. Walter 138 0 0
J. Sellick & Son 135 0 0
Barden & Head 134 16 0
J. A. Hastie 106 10 0
M. Batchelor 103 15 0
H. J. Smith & Sons* 98 0 0

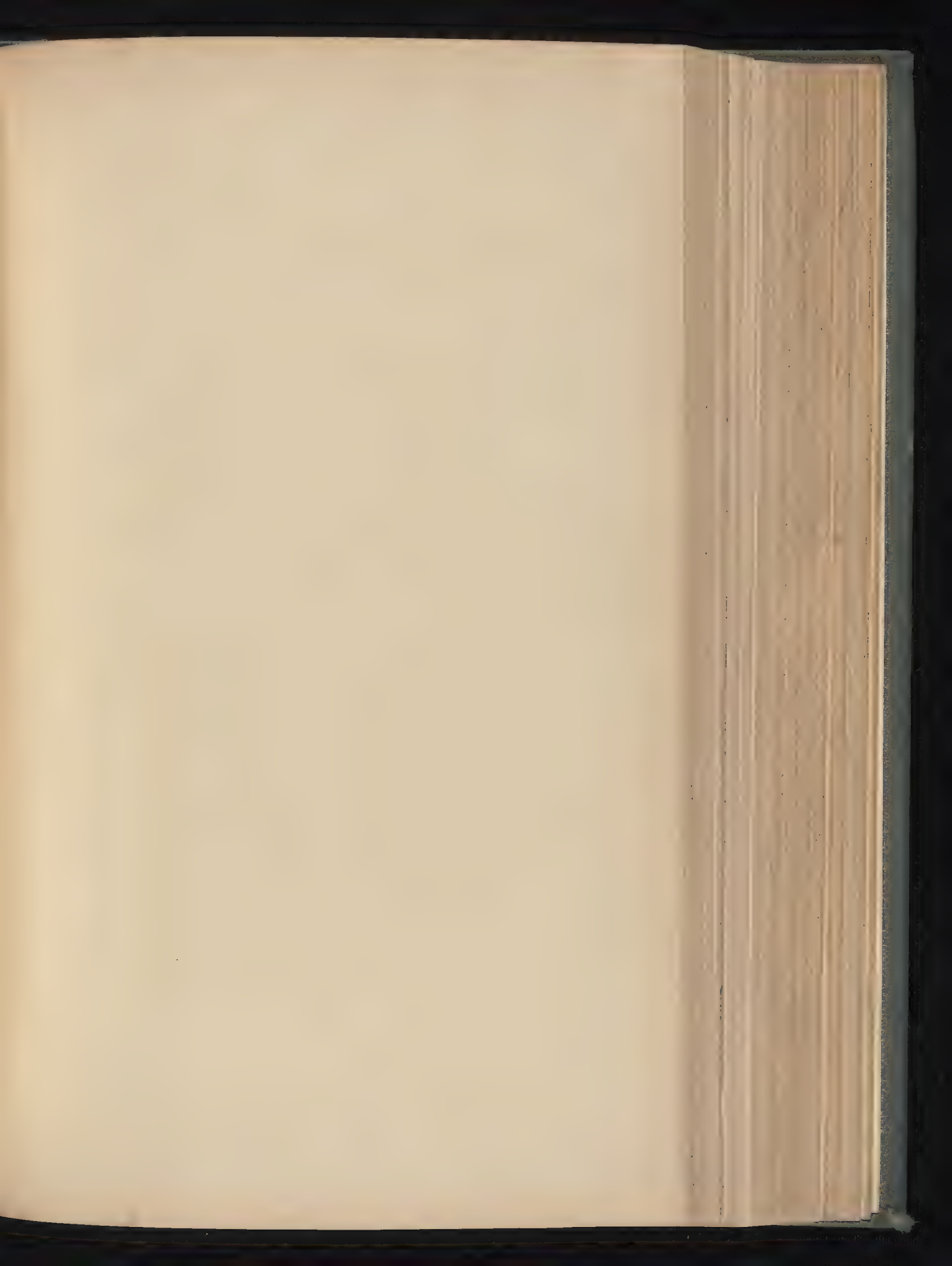
MANFIELD WOODHOUSE.—For making-up Park-street, for the Crick District Council. Mr. E. F. Cook, Surveyor, Leeming-chambers, Mansfield:—
H. Bennett £495 0 0
J. Lane & Son 404 14 5
Hay & Son 384 6 0
Pegg & Bailey 350 13 4
J. Moran £353 19 8
Foster & Aulcliffe 331 17 0
J. Bradley 304 6 0
C. Falcher 292 0 0

REDBOURN.—For alterations to Cumberland Cottage, Crown-street, Redbourn, Herts, for Mr. F. E. Hall. Mr. Henry F. Mence, architect, Town Hall-chambers, St. Albans:—
Vall & Williamson £549
C. Miskin & Sons 535
H. Sallsbury & Son, Harpenden* £449

EWART & SON LTD. 346-348-350 EUSTON RD. LONDON N.W.

N^o 33 DOVER ST. W.
1/4 INCH DETAIL OF FRONT







ENTRANCE, 42 GREAT PORTLAND STREET PROFESSOR BERESFORD PITE, FRIDA, ARCHTCT



DETAILS OF ENTRANCE, 42 GREAT PORTLAND STREET SCULPTURE BY MR F E SCHENCK



OAK MANTEL-PIECE, WHITE HART INN, HULL.
MEASURED AND DRAWN BY MR. ARTHUR F. WICKENDEN.

MARCH 25, 1905.

Examples of French Medal Engraving.....	By M. Chaplain and M. Oudiné.
"Enfants et Grenouilles": Plaster Model for a Fountain.....	M. Max Blondat, Sculptor.
Arch of Trajan, Beneventum.....	From a Drawing by Mr. Theodore Effe.
House near Rugby.....	Mr. J. W. Simpson, F.R.I.B.A., Architect.
Headquarters 1st V.B. King's Liverpool Regiment.....	Mr. F. U. Holme, F.R.I.B.A., Architect.
Technical School, Folkestone.....	Mr. Frank Newman, Architect.

St. Andrew's, Heckington, Lincs. From the Manchester Society of Architects' Sketchbook	Page 315
Headquarters of 1st V.B. King's Liverpool Regiment, Liverpool. Plans	Page 326
Illustrations to Student's Column	Page 328

Biological Laboratory, Girls' High School, Manchester: Messrs. Mills & Murgatroyd, Architects.....Page 329

Additions to Girls' High School, Manchester. PlansPage 330

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AR too little is known of this admirable institution, which, although still in its infancy, has already accomplished a large amount of useful work in the interests of science.

ort. and manufacture. The establishment of the Laboratory was due in the first instance to the British Association. Sir Oliver Lodge, as Chairman of the Engineering Section, drew attention in 1891 to the need for such an institution, and in 1895 the late Sir Douglas Galton again brought the subject before members of the Association, with the result that a deputation was organised for the purpose of endeavouring to secure the support of the Government.

The upshot was the grant of the site and buildings at Bushey House, Teddington, a sum of 19,000*l.* for new buildings and equipment, and an annual Treasury grant of 4,000*l.* It is satisfactory to know that this amount will be increased to 5,500*l.* for the present year, and to 6,000*l.* for 1906 and subsequent years. Further, a promise has been made by the Treasury to ask Parliament for an additional grant of 5,000*l.* per annum for the next four or five years to be expended in the purchase of new equipment. We must point out, however, that even an annual grant of 6,000*l.* is little more than half the amount which is necessary for discharging the duties of

the Laboratory, and that the provision of apparatus by instalments is a most undesirable way of going to work.

From the report of the executive committee presented on the occasion of the annual meeting held at Teddington last week we learn that the financial position during the early part of the year 1904 was a cause of some anxiety, but the large additions to the donation fund fortunately turned the anticipated deficit into a small balance on the right side. Nearly 6,000*l.* was received in the shape of fees for work done, and previous accumulations of income, amounting to about 1,300*l.*, have been applied to the purchase of equipment. A most striking difference is exhibited between the administration of this establishment and of Government departments: At Teddington prudent expenditure is followed by profitable results, while in Whitehall—as recent investigations prove—millions are wasted, with the result that nobody benefits but a few contractors. Consequently the Lords of the Treasury feel so poor that they regard the request for 30,000*l.*, made by the committee of the National Physical Laboratory in respect of new buildings and plant, as a “somewhat extensive programme” which, having regard to the financial exigencies of the time and the numerous other demands on the Exchequer, can only be carried out by being spread over a number of years.”

Foreign governments do not experience the same difficulty in affording adequate support to scientific institutions of national importance. Time after time we

have shown the backwardness of our own Government in this respect. So far as national laboratories are concerned, we may here mention that the Reichsanstalt and the Aichungs-Kommission, supported by the Imperial Government of Germany, have received buildings and equipment to the value of nearly 250,000*l.*, and have annual grants of 16,000*l.* and 8,500*l.* respectively; in Prussia the Versuchsanstalt is provided with buildings and equipment which cost 137,500*l.*, and receives a grant of 15,000*l.* per annum; and in the United States the Bureau of Standards received 70,000*l.* for buildings, 45,000*l.* for equipment, and has an annual grant of 19,000*l.*

Owing to the inadequate nature of the equipment at Teddington the usefulness of the Laboratory is seriously curtailed. This is a very unfortunate state of things in an industrial country like Great Britain. The demand for scientific help in various industries has made marked progress during the last year or two; and unless this demand can be supplied its growth will inevitably be checked—a most disastrous contingency. At the present time requests for assistance from Government departments, local authorities, railway and other companies, architects, engineers, and contractors have often to be declined owing to lack of suitable equipment, and we quite agree with the remark made by Dr. Glazebrook at the last meeting of the British Association that “each time I reply to a genuine request for assistance ‘No equipment’ I feel I have done serious harm to the cause the founders of the Laboratory

had at heart when they pressed it on the Government."

Turning from this unsatisfactory position, it is gratifying to find in the actual equipment and work of the Laboratory every indication of continued progress. On the occasion of the annual meeting recently the different sections of the Laboratory were open to the inspection of the visitors invited, the director and his staff being present to explain the construction and objects of the machinery and apparatus. Bushey House itself is an old-fashioned mansion with outbuildings of ample dimensions, and is admirably suited for many purposes of the new institution, and here are to be found the various laboratories of the Physics Department. The Engineering Department is in a new building containing the boiler-house, engine-room, battery-room, engineering laboratory, drawing office, and a room providing temporary accommodation for the Electro-technical Department. The Engineering Department also includes a small separate building known as the "lathe-house," in which is the newly-installed standard leading screw machine. The boiler-house contains a 100-h.p. boiler, supplying steam to a 75-kilowatt turbo-generating set in the engine-room, and steam for warming the engineering laboratory and Bushey House. In the engine-room there are also a gas-driven generator, and a booster set for charging the adjoining storage battery. The engineering laboratory is divided longitudinally into two bays, one being equipped with lathes and other machine tools, and one with testing appliances of different kinds. It cannot be too widely known that, in addition to original investigation undertaken at the initiation of the committee, the Engineering Department is entirely at the disposal of architects, engineers, and others who are willing to pay moderate charges for tests of apparatus, tools, and materials of construction. Appliances are provided for the testing of steam and vacuum gauges, indicators, indicator springs, steam, electric, and hydraulic motors, pumps, and water meters. Tests on the performance of cutting tools will be considerably aided by the new lathe specially designed for use with high-speed steel. Cylindrical, length, and screw gauges and scales can be compared and verified by the Laboratory standards, and any instruments that can be dealt with by existing plant will be examined, and certified if of sufficient accuracy. For testing materials of construction the equipment includes a 10-ton Buckton tensile testing machine; a 1-ton testing machine for alternate tension and compression, an impact testing machine built by the workshop staff during last year, the new four-throw machine for testing materials under rapid alternations of direct stress, a complete photomicrographical outfit for metals, and a machine for testing gutta-percha in tension, this apparatus having been designed and made in the workshop. It is really a national reproach that the tensile testing machine should represent the largest appliance of the kind at the institution, especially in view of the fact that the Conservatoire des Arts et Métiers in Paris is now provided with a 300-ton machine. The testing of pipes and

cylinders by hydraulic pressure up to 10 tons per sq. in. can also be carried on in the Engineering Department. The equipment also provides facilities for measuring the resistance of pipe coverings to the conduction of heat. In the lathe house, as already mentioned, is the new standard screw cutting machine, built by Messrs. Armstrong, Whitworth, & Co., the leading screw of which, having been calibrated and compensated, is now correct within about 0.0001 in. over a length of 36 in. At the time of our visit this lathe was at work on one of three certified copies of the original screw for the Royal Gun Factory. The machine is a wonderful example of accurate work. It is fitted with a microscope holder for purposes of measurement, and at the fixed rate of cutting the time necessary for the completion of one screw is between two and three weeks. A complete set of tools numbers fourteen, and 106 cuts are necessary, exclusive of those for rounding and undercutting the threads.

Under the head of research work the most important investigation in progress is that into the effect of wind pressure on structures. For the purposes of this inquiry a tower 50 ft. high has been erected in the grounds, and upon this plates and models of structures are mounted for examination, being secured to a revolving steel frame so that the objects can be kept normal to the wind during the observations. Up to the present the distribution of pressure and the total pressure on two similar rectangular plates—with areas of 50 sq. ft. and 5 sq. ft. respectively—have been partially investigated. From the results obtained so far it seems that the distribution of pressure on the windward side of a large plate in the open air is not identical with that over a small plate exposed to a uniform current, but the ratio of the pressures on the windward and leeward sides appears to be the same in both cases. Our present knowledge of wind pressures on engineering structures is largely due to the experiments conducted on models by Sir Benjamin Baker, and to the long series of observations made by Mr. R. H. Curtis, of the Meteorological Office. The inquiry now in progress at Teddington combines the principles adopted by these investigators, and we feel sure the results will be of much practical value to engineers and architects alike. When the tests upon flat plates have been completed, models of latticed girders will be examined, then cylinders and rectangular prisms, and finally the effect of wind pressure on oblique surfaces. The last two forms of test should be of particular interest to our readers, for in one case the objects will represent chimneys, towers, and kindred structures, and in the other the conditions presented by roof surfaces will be approximately reproduced.

In the way of steam research, work is now being undertaken, with the object of determining the specific heat of superheated steam. Some most beautiful and delicate apparatus has been manufactured for the purpose of this inquiry by the Laboratory staff. The general mode of procedure is to measure the heat necessary to raise a known weight of steam from and to any defined temperature,

the steam being heated by an electric current, and the energy required being measured by means of an accurate volt and ammeter.

The Physics Department of the Laboratory includes seven sections, some of which are further subdivided. We regret that it is impossible to do more than mention very briefly the principal work engaging the attention of this department.

In the electricity division investigation has been made into the mercury standard of resistance, and the standard ampere balance, designed by Professor Ayrton and the late Principal Viriamu Jones, has been completed for the British Association of Electrical Standards. A useful investigation conducted in the electrotechnical division was one for the Engineering Standards Committee as to the properties of insulating materials in generators and motors. Research has been made in the thermometry section on the measurement of high temperatures of 1,800 deg. to 2,000 deg. C. In the metrology division numerous sets of templates and gauges have been verified for the Engineering Standards Committee, but the most important work was the calibration and compensation of the master screw of the standard leading screw machine in the lathe-house.

Two researches have been completed in the metallurgical division, one being an examination of the properties of nickel steels prepared by Mr. R. A. Hadfield, and the other an important study of tool steels. Photometric and other tests of incandescent lamps formed the chief work of the optical division. The foregoing items constitute merely a portion of the work performed in the Physics Department, and it should be noted that they are quite additional to the testing done for various authorities and business firms. During the year about 28,000 instruments were examined, including thermometers, optical instruments, watches, sextants, barometers, electrical apparatus, and measuring instruments.

An extensive programme of work for the present year is now being attacked by all departments and divisions of the Laboratory, and we confidently anticipate that the results reported at the next annual meeting will be even more encouraging than those which we have very inadequately described in this article.

QUEEN VICTORIA MEMORIAL, SHEFFIELD. May 11, H.R.H. Princess Henry of Battenberg will visit Sheffield to unveil the memorial of Queen Victoria, which has been erected by public subscription, on a site in front of the Town Hall. The memorial consists of a bronze statue of the late Queen, with English and French figures of Maternity and Labour, by Mr. Alfred Turner.

WORDSWORTH'S HOUSE, PENRITH. We read that the Penrith Urban District Council have confirmed, by a majority of more than five votes, their project to carry out considerable alterations of both the exterior and the interior of Wordsworth's house at Penrith, for municipal purposes. Their Sanitary Surveyor and Engineer has prepared a scheme for a new elevation of the front, to replace the facade which was designed by Robert Adam. The Council's proposals have aroused the protests of the National Trust, the Society for the Protection of Ancient Buildings, and, we understand, Professor Baldwin Brown, on the grounds that the house presents an example of a work, gradually increasing in rarity, of a great architect, besides its associations with the memory of the poet.

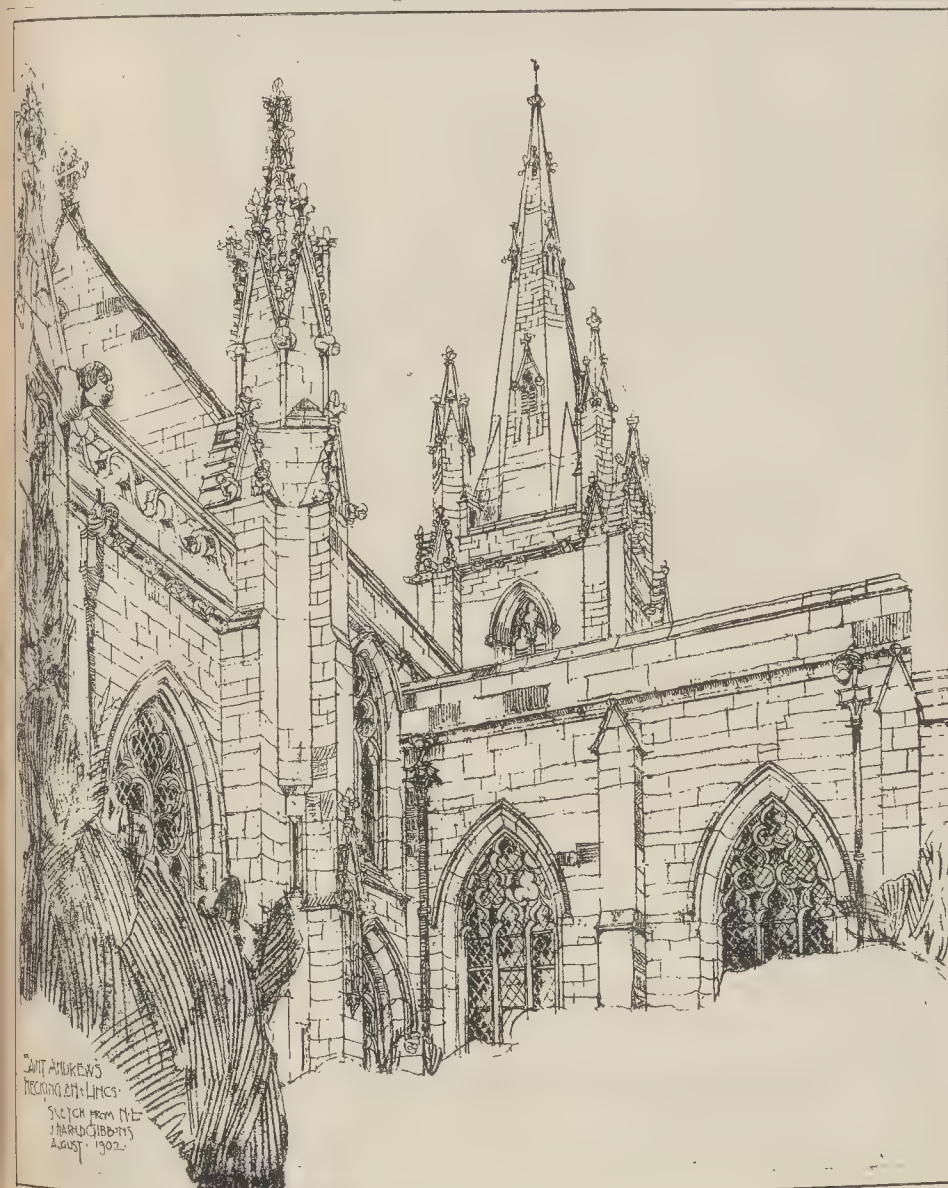
TWO SKETCH BOOKS.

THE vitality of the "Architectural Association Sketch Book" is something most gratifying to contemplate. After all the years that it has been going on, we have here a volume* which has never been surpassed and perhaps hardly equalled for the general excellence of the draughtsmanship. Many great subjects for illustration have of course been practically exhausted, but it is no disadvantage to have some less known or less often illustrated examples of architecture.

*The Architectural Association Sketch-Book. Third series; vol. viii.; 1904. Edited by W. G. B. Lewis and William A. Pitt. Published by the Architectural Association.

Judging from the contents of the volume, it is obvious that the interest in Gothic architecture, at all events as a subject of study and illustration, has not evaporated, in spite of the fact that Gothic as a modern style is so much less practised in the present day. And among the illustrations of Gothic architecture we must mention with especial appreciation the reproductions from pencil sketches by Mr. C. Wontner Smith, who for picturesque style combined with correctness of perspective delineation may perhaps be said to be the best contributor to the volume. His sketches of the west window of Campden Church, with its centre buttress rising so oddly off the hoodmould of the door-

way; of the south transept of Minchinhampton; and of the south porch of Northleach, are, as pencil sketches, as good as they can be; the last-named, which in free and expressive style is the best of all, being however slightly marred by not being quite upright on the paper, an accident which might, we should have thought, have been easily corrected in reproduction by an alteration of the margin line, though in other respects its reproduction by Messrs. Sprague is admirable. Mr. Wontner Smith is also to be credited with an excellent pencil sketch of a fine piece of Renaissance work, the choir stalls of San Giorgio Maggiore, Venice; a subject more difficult to the draughtsman than the Gothic



From the Manchester Society of Architects' Sketchbook.

ones: Among the other pencil drawings two of the finest are contributed by Mr. Theodore Fyfe: One of these, the Palazzo Costabili at Ferrara, is an excellent example of the kind of sketch which, while slight in execution, conveys the whole facts in an effective manner; it is an example of the art of knowing where to stop in what is avowedly a sketch and not a finished drawing. In illustrating a building of which the most important feature is a very bold horizontal cornice, the author has appreciated the advantage of a standpoint near the building, showing the projection and strong line of the cornice in sharp perspective. Another of Mr. Fyfe's contributions is a fine pencil sketch of the Arch of Trajan at Beneventum; a much more difficult subject than the Ferrara building, and very finely treated. Of this we have given a reproduction in one of our plates in this issue, as an example of the work to be found in the present volume of the Sketch-Book.

Fairford Church receives a good deal of attention. Mr. Gillespie gives a measured drawing of the screen, and details to a larger scale, of which the washed drawing forming Plate 8 is very bold and effective in execution. We come into another world of architecture in Mr. Horace Cubitt's measured drawings, in ink line (which best suits this class of subject), of "The Queen's House, Greenwich." This is a very prosaic affair compared with the buildings we have above referred to; it is completely a production of "the Renaissance box of bricks," but it shows the value of proportion and simplicity, especially in the contrast between the treatment of the windows in the lower rusticated portion of the wall and of those above. Mr. Winton Newman contributes an excellent and most fully worked-out set of measured drawings of an angle of the cloisters of Westminster Abbey, which, with less of the charm of draughtsmanship, represents more hard work than anything else in the book, and is highly creditable to its author. The drawings comprise six sheets, two of them of mouldings; and everything is shown in the most conscientious manner. Then we come on the somewhat less interesting subjects of St. George's, Hanover-square, and St. James's, Piccadilly; measured drawings, the former set by Mr. Callow, the latter by Mr. C. L. Gill. These are admirable congregational churches for modern worship, a practical merit which the mediæval type of church seldom possesses; yet, coming after the intensely vital architecture of the Westminster cloisters, it must be admitted that they strike upon the mind as strangely artificial and conventional; and the tower of St. James's—really, in spite of Wren's name, is there any kind of beauty in it? Wren did produce some very beautiful steeples, but this is not one of them, and one would rather forget that he was responsible for it; it is certainly not worth measuring and drawing, except as a warning. Mr. Rollo's set of drawings of an old Scotch castle, Craigievar (including a complete set of plans) is of value not only as an interesting subject in itself, but because these feudal residences are getting so much altered by

modern owners: The plans of Craigievar, both in their original features and the obvious and not altogether successful struggle to fit them for the requirements of modern life, form a very interesting study. There would be a kind of glamour in living in such a house, but it can hardly be very convenient; let us hope the glamour atones for the inconvenience.

Mr. Fulton has drawn a fine and effective title-page to the new volume, with a large draped figure seated in an architectural framework, and a great deal of smaller detail which is very clever and effective; but the lady (who we suppose represents "Drawing") might have been just as effective with rather more attractive features. The drawings are reproduced partly by Messrs. Kell & Son and partly by Messrs. Sprague & Co.; and both firms have done their work admirably.

The Manchester Society of Architects has also started its "Sketch-Book," of which Parts I. and II. are before us. The first part consists entirely of drawings by Mr. Harold Gibbons, selected from those for which he received the Pugin Studentship. These are pen-line drawings, and include both measured drawings and perspectives. Chetham Hospital, a subject which comes naturally in the way of a Manchester architect, forms the subject of three plates. There is a carefully-drawn perspective of part of Winchester Cathedral. The largest and most important drawing is a very elaborate and careful one, filling a double page, of the celebrated sedilia of Heckington. Mr. Gibbons is a most precise and accurate draughtsman, but his style in perspective work is rather hard and ineffective; and whether it be the fault of occasional weakness in the lines of the drawing, or whether it is the fault of the lithographers, we cannot tell, but the reproductions are not as clear or sharp in many places as they should be. Part II. contains an exceedingly neat and highly-finished measured drawing and details of an oak screen in Manchester Cathedral, by Mr. F. P. Oakley; these, by the way, have reproduced admirably, and therefore the partial failure in the others is apparently not the fault of the lithographers. For all ink-line drawings that are to be reproduced, it is of great importance to have perfectly clean and precise lines with the same strength (or blackness) of ink; if this is not the case, the drawings themselves may look quite satisfactory, but the reproduction will be uncertain. Mr. Oakley's third drawing, the screen at Carlisle, fails somewhat in the reproduction from another cause, that of having too close work for the degree of reduction required. Several other measured drawings of screens are contributed by Mr. Vernon, Mr. C. Paterson, and Mr. Holt; and Mr. G. S. Solomon contributes four sheets of careful measured drawings of Tideswell Church, Derbyshire. Measured drawings are no doubt the most valuable things to put in an architectural sketch-book; but it must be admitted that we miss, in the Manchester book, the beautiful and artistic perspective sketches which are so attractive in the London Association's book. Perhaps something of this quality will follow in time.

NOTES.

The Discussion at the Institute. WE cannot let the occasion pass without a word in recognition of the spirit of Professor Beresford Pite's speech at the Institute on Monday night, in which he sarcastically commented on the rare recurrence of evenings like that, when they discussed subjects which really had something to do with "the advancement of the art of architecture," and went back contentedly again to "political squabbles," until in two or three years' time there would be another paper that had something to do with the art of architecture, followed by another relapse into "political squabbles"—and so on. We sympathise entirely with the spirit of Mr. Pite's remarks. Nothing seems to us more dull, more uninteresting, more unworthy of serious attention, than the argufying and polemical talking about points of procedure, and professional etiquette, and professional practice, etc., which occupy so much attention at the Institute, and in which some natures seem to find so much pasture. It is not what the Institute was instituted for, as Professor Pite by implication reminded the meeting. One is obliged to report these vain wranglings, but there is no pleasure or satisfaction in doing it, and we hope Professor Pite's eloquent protest may not altogether fall to the ground. It is gratifying, at all events, to find that the character of the papers read last Monday had attracted a fuller meeting than usual.

The London Topographical Society. The London Topographical Society gave a conversazione on the 16th inst., at the Drapers' Hall. The guests were received by Lord Rosebery in Mr. Jackson's graceful staircase hall; and in the large hall there was arranged a collection of maps, drawings, and engravings of old London and historical personages and events connected with it. The collection fell into three different categories: (1) maps and drawings relating to London as a whole; (2) maps and drawings relating to particular districts; (3) original drawings of Old London. Stretching along a screen the whole length of the Hall and half-way back again was the series of sheets of the plan and elevation of the road from Hyde Park Corner to what is now Addison-road, executed for the Kensington Turnpike Trust.* The maps were a very fine and valuable series, the principal use of which on such an occasion, perhaps, is to stimulate the interest of those who have not yet given attention to the subject, by showing them what an amount of history in the shape of maps of London exists; to study and follow them out at a single evening's entertainment would of course have been impossible; but it is well to bring them into public notice in this manner. The section of illustration of special districts was mainly represented by the collection of memorials of Marylebone, made by Mr. Ashridge, the surveyor to the Marylebone Council, who in carrying out this excellent work has set an example which every London Borough ought to follow. London is now getting

* A portion of this was reproduced in our illustrations plates some two or three years back.

so rapidly altered that every record of a past age should be seized upon and preserved in illustration before it is too late. Among the numerous illustrations other than maps many of those connected with Regent's Park site, before and after the formation of the park, have much both of landscape and of social interest. Among them were drawings of that extraordinary and fantastic erection called "The Colosseum," all memory of which has died out, but which was in the thirties the fashionable resort of the upper class of pleasure-seekers. We are somewhat more sensible in our amusements now; it is doubtful if such a "folly" as the Colosseum would attract London Society in the present day. The plan of the "proposed Royal Champ Elysées (*sic*), to stretch from Park-place to Hampstead Hill, is a fine idea, and if a Napoléon had ruled in London, it would have been carried out. The entertainment was varied by the performance of an excellent little string band in one of the rooms, and by the sight of the very fine old Gobelin tapestries hung in the same room. The only drawback on the occasion was the rather thin attendance. It was evident, from the extensive perspective of refreshment tables, that a much larger attendance had been counted on, and it should seem that the subject of London topography does not interest many people. It is to be hoped that the Topographical Society will not be discouraged from trying again, and will have a better response next time. We can assure those who were not there that there was matter of interest for much more than an evening's study.

The Central Hall at the Law Courts. THE authorities of the Royal Court of Justice seem to be about to alter the position of the statue of the late Lord Russell of Killowen, for the purpose of placing it in a better light. Unfortunately, whether it be in a dark or a light place very few persons will see it, since the attendants are pretty nearly the only people who ever enter the Central Hall. We say nothing here as to whether or not this Central Hall is suitable, having regard to its size, to stamary, but the point to be emphasised is that it is something of a mockery to commemorate great lawyers by statues which are scarcely noticed. It is high time that an attempt should be made, under the direction of some eminent architect, to effect an alteration in this Central Hall by means of a staircase opening out of the north gallery. It does not seem by any means impossible to effect such an alteration—not by a mean rationale of a staircase such as exists at present, but by a design in harmony with the building and of a dignified character. The wretched post-office which now fills up part of the north corridor could then be removed into the Central Hall or placed behind the staircase; at any rate, such a staircase would connect the Central Hall and some of the principal Courts, and might lead, if successfully carried out, to something of a similar connexion between the Central Hall and the west and east Court corridors.

Artificial Pavings. LARGE quantities of artificial stone have been used for paving public footways during the past thirty years, even in many

of the large towns which are situated in flag-producing districts. A report made by the City Surveyor of Manchester contains a useful summary of the opinions expressed by about 300 borough engineers upon the relative merits of artificial and natural stone for paving purposes. While the views so presented are by no means unanimous, there is sufficient evidence in favour of the former when made of suitable materials. Experience shows that as a general rule concrete flagging will last with fair wear for about twenty-five years, but that slabs made from destructor clinker do not last so long as those in which stone chippings form the aggregate. The percentage of material damaged in lifting and relaying over pipe trenches is considerable, and in places where heavy packages are dropped upon the footways artificial flags are very liable to damage. The first of these disadvantages could easily be remedied by adopting lime mortar instead of cement as a jointing material, and both of them by reinforcing the slabs with steel. Municipal authorities in the United States have already recognised the advantages to be gained by the adoption of concrete-steel in paving, but in this country the only effort to counterbalance the brittleness of concrete has been in the direction of increasing the thickness of the slabs to 4 in., and even to 6 in. This is clearly a waste of material, and constitutes one more proof of the backwardness of engineers to avail themselves of the obvious advantages offered by the judicious incorporation of steel with concrete.

The Rating of Electrical Machinery.

THE paper read by Mr. Rud. Goldschmidt to the Institution of Electrical Engineers on "Temperature Curves and the Rating of Electrical Machinery" is of value to engineers, although physicists may be startled by the assumptions made in it. The output of an electrical machine is generally limited by the maximum permissible rise of the temperature of its field coils and armature. Engineers generally specify that the temperature must not exceed a definite amount after working for six or twelve hours at full load. It is of great importance for designers, therefore, to be able to predetermine the temperature rise, and they will find Mr. Goldschmidt's paper very helpful. It is a little misleading to say that approximate methods are preferable to exact mathematical ones as they enable us to keep "in closer touch with the real physical phenomena." If the author means that the engineer, using mathematical methods in which he has little faith, will be compelled to pay more attention to experimental results and less to calculation we agree with him. The author surely does not mean that the more assumptions we make the more do we get into touch with the physical phenomena. As a matter of fact the law on which he constructs his curve for the steady temperature was given by Sir Isaac Newton, who mentions its limitations. The curve itself is the well-known exponential curve. We were interested to find how closely the experimental curves obtained by the author agreed with it. A mathematician, how-

ever, would be able to draw a portion of a parabola or a hyperbola which might fit into the experimental curve even more closely. We cannot agree that the power dissipated per unit surface depends only on the difference of the temperature of that surface and surrounding objects. A black surface dissipates more heat than a polished surface. The subject of the rating of electrical machinery is one that has not been sufficiently studied. Mr. Goldschmidt's paper, notwithstanding its limitations, is a good introduction to the subject.

Society of Arts. On Tuesday evening Mr. F. Bligh Bond read an excellent paper at the Society of

Arts on the subject of "West-country Screens and Rood-Lofts," of which he has made a special study. He gave a sketch of the history and development of the rood-screen and of its artistic treatment, remarking that wood detail began as an imitation of stone, but we found it becoming gradually more adapted to the nature of the material, and in the fully developed west-country type of screen there was a close correspondence between the design of the woodwork and the nature of the oak in which it was wrought. This, he thought, was by no means so completely the case in other districts, where the detail was often too imitative of stone-work—battlements, etc., reproduced on a minute scale. Though much mischief had been done not only by the destruction but by the hasty and injudicious repair of many of these screens, sufficient remained to form an artistic storehouse of great value, and of high importance to those who were seeking to revive the beautiful handicrafts which were the pride and joy of our forefathers. The paper, which is well worth attention, will of course be printed in full in the *Society of Arts' Journal*. Mr. G. F. Bodley occupied the chair on the occasion.

Mr. Fraser's Exhibition.

At the Fine Art Society is to be seen a fine collection of water-colours by Mr. John Fraser, a sea-painter whose powerful work is far less generally known than it should be. Mr. Fraser's greatest successes have been in oil-painting—or at least we should have said so but for the large and grand water-colour here under the title "Morning after a Heavy Gale" (25). This, which is on a far larger scale than is usual in water-colour "marines," is a most impressive work, not only in the way in which the weight and momentum of the large waves are conveyed, but in the lurid and threatening look of the whole scene: it is one of the most real things we have seen in sea-painting. "A Summer Gale, Newhaven" (57) shows finely another aspect of the sea in rough weather. Among the smaller works are some beautiful bits of composition; we may mention especially "On the Hamble River" (14); "The Ouse at Piddinghoe" (22); and "Wet Morning, Brighton Beach" (28), the last a capital instance of the effect which may be produced by a very slight sketch in which truth of colour and atmosphere are preserved.

The first exhibition in England of the New York Water-colour Club, now on view at the Modern Gallery in Bond-street, is an artistic event of some interest. Considering the tendency of American artists to follow French models in everything, we cannot be surprised to find that there is little representation of what we in England are accustomed to consider the true and pure school of water-colour painting; the general style of work is quite different from that which prevails at the gallery of the Society of Painters in Water-Colours; there is none of the transparency of effect which we see in the best English water-colour landscapes, many of the drawings having in fact hardly any of the look of water-colour about them. There is however a high standard of excellence in its kind in the collection, which is quite worth a visit. Still Life subjects (not very numerous) are all good. There are some powerful figure pictures—Mr. Herter's "Sorrow" (3); Mr. Irving Couse's "Roasting Corn" (46); and Mr. Franzen's "Late Afternoon" (76), may be mentioned, though the last-named is entirely without what we call the quality of water-colour. Mr. Potthast's "Moonlight Sail" (59), in which two figures show in dim light on the stern of a boat, is a fine work both in composition and effect. The habit of filling in the lights between trees, for example, in body-colour, as in Mr. Palmer's "The Cedars" (60), an English critic has no right to quarrel with, since some of our own younger artists have adopted it; but it is a rather factitious way of getting an effect. Mr. Palmer's two snow pictures (41 and 47) are brilliant in effect but owe much to body-colour. In short, this is a very interesting exhibition, but it is not what we should call a water-colour exhibition.

The painting of gardens is becoming almost a characteristic of the present day, several water-colour artists having made it their special province. Mr. E. Arthur Rowe, who is one of the ablest and most devoted of the garden painters, has a collection of drawings of this class at Messrs. Dowdeswells' Gallery, which contains a great deal of excellent work, mostly in the painting of formal gardens in which the heavy (and we think in some cases ugly) masses of clipped greenery form the background or framework for the play of the light and colour of flower-beds. The famous garden of Drummond Castle furnishes several subjects; also Hampton Court, the illustrations of which are among the best things in the collection. Where the author introduces the old house or castle as part of the scene, he shows also that he knows how to treat buildings in water-colour; the buildings in "Crathes" (26) and "Drummond Castle" (60) are as well treated as the gardens.

Water-colours by two Ladies. MISS KATHERINE McCracken and Miss Nellie Hadden have a small joint exhibition at the Modern Gallery. Miss McCracken's are chiefly landscapes or bits of Italian cities; both classes of subjects are treated in a sketchy but artistic manner. Miss

Hadden, who deals chiefly with animals, is much more accomplished in technique; her horses and dogs are about as good as they can be, also the two highly-finished studies of lizards; and the giraffe looking in at the window at two others—"an old resident inspecting the new arrivals," is almost laughably true to giraffe life and manners as they can be studied at Regent's Park.

THE President of the Institute of Architects and Mrs. Belcher received a large party of friends on Tuesday evening at the Institute of Chartered Accountants, arrangements having been made with that body so that Mr. Belcher could have the satisfaction of welcoming his friends in an *encadrement* consisting of his own architecture. The company were received by Mr. and Mrs. Belcher in the characteristic domed apartment which forms the Council Chamber. There was music in the large hall, followed later by dancing. Flowers were profusely and picturesquely distributed on the staircase and elsewhere, and there was supper in the library, to our thinking the most charming interior of all, with its characteristic balustraded bridge across the middle connecting the two upper book-galleries. It was a most successful and pleasant entertainment, enjoyed, we may venture to say, by all present.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The usual fortnightly meeting of the Royal Institute of British Architects was held on Monday at No. 19, Conduit-street, Mr. J. Belcher, A.R.A. (President), in the chair.

Mr. Graham announced the decease of Mr. Chas. Bennett Arding, Associate, elected 1887, and Professor Ludwig Peter Fenger, of Copenhagen, hon. corresponding member, elected 1888.

Decorative Painting.

Papers were then read on "Decorative Painting" by Sir Wm. Richmond, K.C.B., R.A., Mr. Alfred East, A.R.A., and Mr. Solomon J. Solomon, A.R.A., of which the following are abstracts:—

Sir Wm. Richmond, in his opening remarks, referred to the ties which united the arts of architecture, sculpture, and painting. The votaries of architecture were builders who designed and erected, sculptors who designed and carved, painters who enlivened its severe spaces with the glory of colour, craftsmen who brought glitter and sunlight into the darkest nooks as rays of light into a cavern. Late in history architecture had wished to go alone. Hence arose the danger that ornament might be stereotyped and of trade manufacture, painting cease to add its magical charm, and sculpture be relegated to an independent and solitary mission. But a return to a healthier union of the arts was in progress—thanks in a large measure to the Institute, which, more than any other artistic institution in Great Britain, was encouraging "fraternity," and taking more and more sculptors and painters into its confidence and within its ranks. Hence the Institute was becoming stronger, broader in view, larger in artistic enterprise; and the sculptors, painters, and craftsmen whom the Institute had honoured by electing among them were gratified. The great traditions which bound the past of architecture, sculpture, and painting had been kept alive by a few serious workers who did not believe that a new art was possible, any more than that a new man could be created. The great principles which had made art to be the highest factor in true civilisation would grow in usefulness as their exponents gathered together in closer bonds of sympathy. Union is strength. They had to educate an inert public to use their higher faculties, to cultivate their observation, and enjoy in peace what was permanent and beautiful.

Coming to the special branch of the arts he was to discuss—viz., decoration—which included mosaic and mural decoration—the author said he feared that the delightful method of "buon fresco" was for the present an impossible one to pursue in London owing to the vitiated atmosphere produced by disintegrating acids which were destructive to lime; but in the country, where pure air was obtainable, "buon fresco" might be adopted for interiors with as much security as in Italy in times past. Provided there was no poison in the atmosphere, damp was the only enemy to fresco. The author gave particulars as to the preparation of the walls to be decorated, what materials to use and what to avoid, the method of applying the colour, etc. To be successful, all preliminaries, studies, and cartoons must be absolutely certain both in their relation to design, form, and colours; so that the painter when he paints has only to think of his difficult but most fascinating technique. Sub-division of the various stages of development must be rigidly adhered to.

Mosaic is as adaptable to exteriors as to interiors, but to be effective mosaic must be used lavishly, as in S. Mark's, in Santa Sophia, and in many churches and chapels in Ravenna. But mosaic demands another kind of design and drawing from any other material for decoration. The translation of pictures into cubes is obviously absurd. Mosaic can do what no other method is capable of, but it cannot imitate excepting inadequately. The design must be clear, the drawing severe, the accidents few, the light and shadow rare. An architect should build for mosaic decoration if he intends to use it. He should give plenty of domes, semi-domes, alcoves, because mosaic looks best upon curved surfaces, where it is least likely to come into competition with pictorial design. A building to receive mosaic should have few mouldings or frames; the framing of mosaic pictures should be executed in mosaic, and string-courses as well as mouldings should be so designed as to be in harmony with the style which is essential to mosaic, and that is severe. If the architect decides to make a sumptuous piece of coloured decoration, he and the other artist, his coadjutor, must work together, from the first initiative to the last point of completion, if the final result is to be severe and homogenous. The architect must consider his decoration while he is initiating the plan for his enterprise as well as the elevation. In a well-built mosaic the construction is never hidden or the joints concealed. The mosaics that look best from a distance have a good wide joint between every cube.

The next best method for wall decoration to "buon fresco" is tempera painting upon a dry wall of lime and marble dust. The tempera used is the yolk of egg only, not the white. When dry this becomes as hard as the hardest varnish. The yellow tint gives a very agreeable tone to the white lime. Almost all colours can be used with egg. Egg painting has stood the test of time; many of the wall paintings at Pompeii are alone in egg, and all the tempera pictures and wall-paintings in Italy which are not fresco or wax are painted with egg tempera.

Wax painting is another method well suited to our climate. The method, technical details of which were given by the author, may be seen in the National Gallery exemplified by portraits on wood of the 11th century A.C., and in many of the wall-paintings at Pompeii and Herculaneum. The author said he had tested some Egyptian wall-paintings and found that they were executed in wax and spirit. Wax-painting is perfectly durable on a wall, but not on canvas. In England it would be advisable to burn the wax well into the wall with artificial heat. Oil painting should be entirely abjured in decoration.

All decoration should be done upon the wall where it is subjected to environment, and not be applied. Notwithstanding personal discomfort, painters should execute their works in situ, even in a dark corner, because that dark corner is the place of the picture, which if painted in full light of a studio will be quite disappointing when it is placed in an obscure light. The law of fitness holds as good as regards sculpture. A statue designed to be set in a niche should belong to it and to nowhere else—more, it not only belongs to its immediate, but to its less immediate surroundings also, and is out of place away from there.

Treating of colour in architecture, the author said that, being unaccustomed to it in modern times, prejudice was strong. Some would doubtless be shocked if they saw the Parthenon,

painting. That, of course, they must all agree with. He might take it that one difficulty of decorative painting was that painters as a rule—and they admired them for it—liked to do their own work. It was their laudable pride that the work had been done by their own hand and by no one else's. When they came to great buildings, and domes and arches and great wall spaces, it always seemed to him that that was an idea of perfection which could not be carried out, and that the help of others must come in. He felt that it would be the highest point of the great painter to train others by getting them to assist him in carrying out a great work which he had designed. Decorative painting, he took it, was to decorate, and the great thing was the design, and when that design was settled in scale and in colour it would be only proper, and, in fact, absolutely essential, that others should be called in to help them do it. All the great Italian painters did that. He might mention the case of Verrio, who started to paint the big painting at Christ's Hospital, but gave it up when half through, and left it to young men to complete it very badly. If he had bestowed his time on the design, and given it to others to work out, the result would have been a great deal better. He did not understand whether Mr. Solomon suggested a new school, for there were the very solid foundations of two excellent schools in which the work he proposed could be carried on. There were the schools of the Royal Academy, where students in painting, sculpture, and architecture worked side by side, and the Academy did endeavour to encourage this by giving the students from time to time a commission to paint on the walls of the Academy premises some of the prize designs which were won by students. If that could be carried further it seemed to him they would have there a very good commencement, at any rate. There was already a wish for architects and sculptors to work closely together, and that seemed another way in which Mr. Solomon's idea might be arrived at. Then there was the Royal College of Art at South Kensington, which for years had been working on these lines, and in Stevens's time produced a great deal of excellent work, and was also in these times producing excellent work. He felt that both of these schools only wanted the recognition and encouragement of the public to do what Mr. Solomon proposed. In a very small way he himself had had the help of the small way at the College of Art to paint a ceiling, which they did exceedingly well, and which they enjoyed doing very much, and he had now the help of some of the sculptors to carve some of the figures on one of his buildings. It was an enormous encouragement to them. They entered into it with great enthusiasm, and it would be a pleasure for any architect to employ these young men to work on their buildings.

Professor Beresford Pite, in seconding the motion, said they were also indebted to Sir Aston Webb for mentioning the fact that at the Royal College of Art there was in existence practically the system which Mr. Solomon desired, and he hoped that Mr. Solomon would pay them a visit. If he did he would discover not only that the students of architecture, design, modelling, and painting worked together and were associated with one another in each of the four schools, but they happily also had two travelling scholarships. One was for three months and the other for six weeks, and Mr. Solomon would be much encouraged to know that by the goodness of a paternal government every year sculptors and architects and painters travelled together. He hoped the day would come when these artists would work hand-in-hand, and when those present would have the privilege of employing them. Mr. East would have to convert the sculptors before he converted the bricklayers and the stone-masons to landscape as a means of decoration. What did they mean by decorative painting? Was there not a lurking idea that decorative painting was painting without atmosphere and painting without perspective? That idea would have to be dispelled if landscape was to become a means of decoration. If this solemn and beautiful and altogether modern art which took the mind of nature with her mists and distances and lights, and translated them so delightfully as to become a continual reality, had to sacrifice these methods of nature, and if they had to take the atmosphere and the perspective away to enable it to take its place between pilasters and solid mouldings, it would

have to cease to be landscape art. It would become Japanese pattern design, and as such very beautiful and very helpful. Landscape would have to pass through the crucible of the sculptor before it could come down to the level of mere practical building art. But was not decorative painting, after all, the painting that was merely suited to its position? No definition as to the absence of perspective or the difficulties of atmosphere was needed, provided that the decoration was suited to the position. He confessed that he heartily sympathised with Sir Wm. Richmond's criticism, that where atmosphere was represented on a wall the sense of solidity necessary to that wall vanished, and the mind could not conceive distance in the panel and, at the same time, structural support. They were unfortunately compelled by custom to admit distance and perspective into the panel, but that unfortunate recognition revealed the fact that they had unhappily lost the real sense of building, the real sense to enjoy the value of the wall, the real feeling of enclosure and support, which was the basis of architectural art. Until they got through the stucco and wall papers, and felt the bones within their building, they could not derive genuine architectural satisfaction from the design of its structure or the structure of its design. The matter brought before them that night was most important, and he was much obliged to the Council for making it the subject of discussion. He ventured to think that no subject was more important. They had had during the century that was passed some of the greatest features of English history. They had with them now artists who were second to none, and during the same period they had had architects who had raised hopes within their breasts that, after all, England was not a second-rate country in architectural matters. Their ecclesiastical and domestic art could challenge comparison with the art in any country in the world, and this was recognised, one was glad to know, by Continental nations. But unfortunately the great painter and the great architect had not been yet fused into the architect—and he must in this connection use the term architect—who could decorate. That man had not yet come, and why was it? Probably the fault lay in education. He felt that before they could get the combination necessary to remedy the fault they must recognise the fact that no architect could by mere artistic friendship with a painter succeed in inducing within the painter the architectural sense, and conversely the painter could not infect the architect by a friendship or sense of sympathy or by a mere expression of harmony of ideas from his standpoint. A school of decorative architects had to be framed from the roots upwards. If architects would recognise that they were living in an age which demanded great buildings, and that what was needed was a great architect to decorate the great buildings, they would see that there was something besides construction, essential although that was; something besides antiquarian squabble of the style, important although that was; something besides professional politics, which was eating into the vitals of the Institute, and destroying their ideals of true art; something more essential, that to architectural art than they had yet laid hold of. The subject which they were dealing with that night was brought before them once in a way. They had the pleasure of discussing such papers as they had that night, and then for the next few months they resumed their professional political squabbles. In the early part of next session they would discuss education, and then go back to squabbles; and then they would perhaps have a President who would suggest a paper on mosaics, and then they would go back to squabbles. If they recognised that they lived in an age which demanded great decorative buildings, and a school of architects to undertake the building of these, they would take the first step towards showing that there was scope for education in this matter, and that the mere sentiments which had been so eloquently expressed by Sir William Richmond represented a real need, and that it was their duty as architects to recognise that they had neglected decoration; that they had been concerning themselves with matters far below the architect's scope and the architect's ideal, and that there was here a field for the proper decoration of public buildings, a field to enter into and take possession of, and supply a great public need. It was not the question of calling in a great painter to decorate a great building.

They had to go behind the sculptor, and to realise the first principles of architectural form; they had to take colour, and discuss its value and placing, and its relation to the ornament with which they laced it down and tied it to the building; they had to grow from the form through the increasing value of material such as marble and bronze to the pure colour in all its fulness and richness on which they laid the fine ornament of the goldsmith or the fine ornament of the lace-maker, and pass from that into a sphere where figure decoration became apposite; and possibly in that sphere might come the atmosphere and higher qualities of decorative art. All that lay before them. Happily they now had students taking up the subject of decoration. Possibly there was no one present with any higher ideal than the idea of just feeling the responsibility of recognising the fact that there was such a thing as colour decoration. Might they, then, that night take a vow to forswear professional politics and seek the good of architecture, and advance the art of architecture which lay open to them in this great field.

Mr. H. Heathcote Statham, in supporting the vote of thanks, said he should like to say how much he admired the practical character of Sir William Richmond's paper. They could always have plenty of theory, but Sir William Richmond, in his paper, had given them the practical experience of an artist who had been working in those different materials and studying them, and really telling them how the work could be done. He was also very gratified at hearing Sir William's remarks about mosaics, which he (the speaker) had always thought was so peculiarly a form of architectural decoration, because it was a built-up picture, a kind of architecture on a small scale. He ventured to suggest whether, in talking of decorative art, and especially decorative painting, painters and writers on art were not often making a confusion by using the word "decorative" in two different senses. The very first time he had the pleasure of meeting Mr. East he remembered his remarking that landscape painters were just as particular about their lines as architects were. He (the speaker) replied that he had never had the slightest doubt of it. Every picture, whether a landscape or figure picture, had to be decorative in line; if not, it had no *raison d'être* as a picture. But then, surely, there was a second sense in which the word "decorative" was used—that of the painting or piece of sculpture which was in some way subordinate to the architectural lines, and which gave up a little of its own individuality. There was a remarkable passage in the "Life of Burne-Jones" in which someone, in reference to his picture of the three Queens weeping over Arthur, wanted to know why he did not give them a little more individual character: the faces were all the same. And he said: "Well, if I had made them individual characters, what would they have been? They would have been Augusta, Esmeralda, and Dolores, considerably overcome by a recent domestic bereavement." Burne-Jones wanted to keep them above that, on a perfectly ideal plane. It might be said that Burne-Jones carried that a little too far; but that was an illustration of the fact that when they had to use art, simply regarded as a decorator's architecture, it had to give up some little of its individual life. Coming from that he should like to remark upon what Sir William Richmond said—that it was such an important element in decorative painting that it should be executed in the midst of its surroundings. It was a very remarkable thing that the French, who had done more decorative painting than any other nation, had lately given that up; they had found it much easier to paint an immense picture in the studio and then fit the canvas on the walls afterwards. He could not help thinking, in going through the French *salons*, and seeing some of these enormous and rather coarse pictures, how much they had lost through being painted away from the site; that they were not in harmony with it; they were so self-assertive, as one might say. When they came to consider the question what decorative art meant, and how far landscape could really be meant, and how far landscape could really be decorative, it appeared to him that landscape essentially meant distance. It meant successive phases of distance. Professor Pite anticipated him in saying this, but he quite agreed with him in saying that, everything that people called decorative landscape (he had seen a great many of them in the French exhibitions) came down to this, that they were quiet, rather flat landscapes, with not a very great effect of distance and no

very great disturbance in the atmosphere. He thought decorative landscape of that kind could be a very fine effect combined with architecture, but he did not think it touched the essential point of landscape art in itself. In fact, the easel picture had a claim to be regarded as a separate thing. One might paint a landscape which was a little flat and rather subordinate in order to form part of a decorative scheme; and then one had an easel picture of a landscape, like most of Turner's, which was put in a frame so as to be divided from other things, and so looked into as an individual work in itself, apart from its surroundings. Both sculpture and painting had a right to that individual life. In sculpture, again, look at the front of Wells Cathedral. The lower sculptures, these straight up-and-down figures in the niches, these purely decorative sculpture; they had very little expression; they seemed to be part of the architecture. When they came to the Resurrection series at the top there was far more movement and vigour; but that was all half-size; and he was not certain that it was not partly an instinctive feeling on the part of the architect that life-size figures of that kind would have destroyed the repose of the building. Morsé's fine group called "Gloria Victis," in one of the courtyards of the Hôtel de Ville, Paris, was a magnificent piece of sculpture which had its own story, its own action, and its own line. It was far too vigorous to be associated directly with the building; it was surrounded by an architectural court; and each of the two added to the effect of the other. But he mentioned that as an instance of the power of sculpture to stand alone, and the fact that it really must stand alone if it was to be treated with all the vigour and lifelike expression of which it was capable. One word about ceiling paintings, which had been referred to. Wherever figures were used in a ceiling it seemed to him essential that they should, as one might say, "float." The only ceiling painting, he believed, that Paris de Chavannes ever painted showed two rows of figures with their feet at the sides and their heads towards the middle; the effect of which was that the observer did not know which way he was standing. He would instance as the right sort of thing the ceilings that used to be painted by the late M. Mariotton, which everyone who went to the French salons annually must have noticed. They were not really what one quite liked in colour; but they had that floating effect, not the prosaic composition of figures standing upon the ground; they had the lightness of effect which seemed to be required in a ceiling. The conclusion he reached particularly to emphasise was that there were really two kinds of art—decorative art and individual art. Nobody was more convinced of the importance of regarding decorative art as the ally of architecture than he was. They had far too little of it in England; the Government gave far too little opportunity and encouragement to it; but he would only urge that individual sculpture and easel pictures stood upon their own ground, and were not to be scolded at because they were not in the same sense decorative art.

Mr. J. D. Grace said he was delighted to have been there to hear such an experienced artist as Sir William Richmond, who had had to confront enormous difficulties, and, having known what they were, had shown from his experience how they were to be overcome. He believed that it was only those who had entered into the difficult arena of decorative painting who would be able to teach architects very much of what decorative painting should be. It appeared to him that they ought to begin by considering that decorative painting ought really to be painting which decorates in the sense of adorning a building. The building must from the beginning be the one thing to study. The subject of the picture, of course, was important in itself, but regarded from the decorative point of view it did not matter one bit whether the subject was a battle or a picture of saints, for the point was that it should be both in colour and form, and in the space that it fills, a painting that would really improve the building. That appeared rather to have been lost sight of in the discussions on decorative painting which he had heard in those rooms before. As regarded the use of landscape in decoration, it was not accident or ill-will that had kept it from being largely used for decoration. In fact, it was used in early examples of tapestry, and it might be said why, if it was used in tapestry, should it not be used for walls? But tapestry was not structural, and the eye

did not expect support, and the only positions in which landscape could be legitimately used as decorative painting would be those positions which were obviously not intended to support. They could put a landscape into an arched recess, but to put it along a wall which obviously carried the structure at once weakened the effect of the building. In Sir William Richmond's admirable remarks upon mosaic, with which he supposed most of them would agree, there was one point he did not mention, which was that undoubtedly angles must be rounded. In all the old buildings in which mosaic was seen to advantage there were no sharp angles in the surface which was covered. As regarded wax painting, it should be remembered that where the atmosphere was impure such painting had its drawbacks, because it was impossible to keep the dirt off the painting. However hard it might appear, it always retained some of the dirt, and it was almost impossible to cleanse it. There was another thing to be borne in mind in those media of painting in which spirits of turpentine was employed. All essential oils darkened, and that was why varnish darkened. If they dipped white paper in turpentine, and put it away for a few years, they would find it became as dark as brown paper, and what happened with the paper was what happened with a painting. From the day it was painted it went on darkening, and although it was comparatively a slow process, yet a painting which was executed with a free amount of turpentine would never retain the same brilliancy as fresco, where fresco was possible.

Mr. E. W. Hudson pointed out that Mr. East had not told them that he had put his theories into practice in the unique window in stained glass in New College Chapel, N.W., London. Mr. East had there treated landscape conventionally, and he was sure if they went in the summer and watched the setting sun coming through the window they would be fascinated. If, however, they saw it in winter, and were satisfied with conventional glass windows, they might probably come away with their fancy not upset.

The Chairman said a short time ago he saw in one of the papers a paragraph headed "A new use for walls; a solid structure for the purpose of decorative treatment." He thought at once this must have been written by one of his friends the painters, but he found it was by the engineer of the new Ritz Hotel, who apologised for the wall as being necessary to keep out the weather and as being of some advantage for the internal decoration of the building. No doubt as architects they would long make use of walls for structural purposes, but it might be well to take the hint and see that their walls provided places also for pictures. They had learned something of the use of sculpture in giving expression and meaning to their buildings, and they wanted to learn also how painters could help them in decorative work. But the great point which he thought they had learnt that night was that it was essential they should all work together from the very beginning. From the very inception, the architect, painter, and sculptor should work together, and if they be united in one person so much the better. It was essential that the sculpture and painting should form an integral part of the building so that it was not complete otherwise. It was quite true that architecture had something to say, but it could say it more strongly and more eloquently if it was aided by the sculptor and the painter. He felt that with regard to the form of decoration there ought to be a place for each of the different methods of which they had heard that night. The one thing they had learned was that there should be no atmospheric effects admitted on the structural parts of the building. Piers, arches, chimney-pieces, and walls which were absolutely intended to be solid and do actual work, should be treated with a flat decoration and something which had no perspective, but he saw no reason why under large arches and in panels a greater freedom might not be allowed. Perspective in such cases might be introduced, and they knew how valuable that might be. In the Vatican there were two wonderful pictures of Raphael—the "School of Athens" and the "Dispute of the Sacrament." In the case of the "School of Athens" they had an architectural perspective carried out in the panel giving distance, and it looked like an immense addition to the room. It offered a splendid background for the figures which were thoroughly in scale with the building. In the "Dispute of the Sacrament" they had a delightful bit of

perspective with landscape in the distance, but, of course, the figures were the most important. The perspective gave immense size to this otherwise rather small room. The treatment of the ceiling had always been a puzzle to him, but he did not propose to say anything about it now. As Professor Pite had said, admirable work was being done at the school at Kensington, and he hoped at the Royal Academy it would be possible to allow the students to mix more freely than they had done, for there were many things which painters, architects, and sculptors should work out together.

The vote of thanks was heartily carried, and Sir Wm. Richmond briefly replied.

Mr. East, in reply, said that perspective had been indulged in by every painter in the past, and yet it was objected to in landscape. He said there were two aspects of landscape—one easel and the other decorative, and he presumed that in the education of students the treatment of landscape would be purely and severely decorative. From that point of view it could be treated, and it had the advantage that it did not abstract one by the assertion of incident or anecdote. He felt that they all wished for the union of their arts, and they all ought to work together for the accomplishment of one great aim.

Mr. Solomon said he had no idea that the system at South Kensington was so complete, and his idea was not to compete with existing schools, but to supplement them. The student came from the school and did not know what to do next, and if he had a year at decorative art it would put him on his feet.

The Chairman announced that the next meeting would be held on April 3, when papers on "The Planning of Cities and Public Spaces" would be read by Professor Beresford Pite and Mr. J. W. Simpson.

AN ELECTRICAL EXHIBITION.

A USEFUL exhibition has been organised by the County of London Electric Supply Company in order to show their consumers and residents in their areas of supply the latest developments in connexion with electrical lighting and heating. The exhibition is being held at 118-122, Holborn, E.C., and it is well worth visiting by all interested in the applications of electricity. The special feature of the exhibition is the very extensive use that is made of motors for driving purposes. This affords trade consumers and manufacturers an opportunity of seeing how easily machinery of practically every description can be driven electrically. The exhibitors volunteer full particulars about actual running costs and depreciation, and the Electric Company also give intending consumers full information regarding the running costs of the motors actually at work on their circuits. We are glad to note that the company only charge 2½d. per unit for power and heating, and in special cases they allow very considerable discounts on the meter bill. For basement lighting they make a specially low charge of 3d. per unit.

The exhibition is divided into two sections, the first of which, on the ground floor, shows exhibits of lighting, heating, and electrical accessories. The second section is mainly in the basement, and shows the application of electricity as a motive power.

The Electrical Company, of Charing Cross-road, show the Luna Flame Arc Lamp. In this lamp the carbons are inclined to one another at an acute angle, and the light efficiency is very high. The Nernst lamps, for which they are the agents, will also interest consumers. We were specially struck with their "waterproof" motor, which ought to prove useful for crane work.

The photometer bench made by A. Wright & Co., of Westminster, with a Simmance Abady flicker screen will interest central-station engineers. This device certainly simplifies photometric work.

The Westinghouse Company exhibit the new Cooper Hewitt mercury vapour lamps, and their other exhibits are of great technical interest.

Messrs. Maple & Co. exhibit an "electric" tablecloth. A lamp standard, having two needle contact makers on its base, lights up at once when placed anywhere on the cloth. There are many other novelties shown by the leading electrical manufacturers.

We can heartily congratulate the County Company on their enterprise, and the exhibition deserves to be a success.

THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A YORKSHIRE district meeting of the members of the Association of Municipal and County Engineers was held at Cleckheaton on Saturday, March 18. The members assembled at the Town Hall, where they were received and welcomed by Mr. Councillor Field, J.P., Chairman of the District Council. Mr. A. T. Davis, C.E., County Surveyor of Shropshire, President, occupied the chair, and among those present were Messrs. A. M. Fowler (Manchester), J. P. Norrington (London), W. H. Hopkinson (Keighley), Settle (Heywood), J. Parker (Hereford), J. Mallinson (Skipton), S. G. Heywood (Brighouse), C. Lund (Cleckheaton), Wellburn (Middleton), Massie (Wakefield), E. J. Silcock (Leeds), and others.

On the proposition of Mr. Lund, Mr. W. H. Hopkinson, of Keighley, was unanimously re-elected Hon. Secretary for the Yorkshire district.

Municipal Works, Cleckheaton.

Mr. C. Lund, Surveyor to the Urban District Council, read a paper on the "Municipal Works of Cleckheaton." He said Cleckheaton, in its industrial aspect, was probably unique. Such a diversity of manufactures could hardly be found in any other English town of similar importance. Cleckheaton's economic prosperity was at the source of its public enterprise, and it was necessary to lay some little stress on the existence of large and thriving textile mills and of works devoted to wire-drawing, cord-cloth, chemicals, leather, and engineering, in many various branches of each trade. In 1904 the population was estimated at 13,000, and the rateable value was 58,288. The area over which the Urban District Council had charge covered 1,755 acres, and ranged from 240 ft. to 560 ft. above ordnance datum. More than 14 miles of roads and streets traversed the district, certain lengths being subject to peculiarly heavy traffic. Some 6½ miles were main roads. The County Council paid to the District Council the whole of the actual expenditure on maintenance plus 5 per cent. for establishment charges, the average annual expenditure being 336l. per mile. The other roads of the township were maintained at the rate of about 175l. per mile per annum. The materials used on the roads were Leicester granite and Low Moor dress.

The tramways of the British Electric Traction Company (heavy woollen district) connected Cleckheaton with Dewsbury, and with the intermediate townships of the Spen Valley. The town hall with municipal offices had set something of an example to those building in Cleckheaton for private purposes. It was erected at a cost of 17,000l., under the supervision of Messrs. Mawson & Hudson, architects, Bradford. In addition to the large hall of 90 ft. by 35 ft. by 34 ft. high, which accommodated comfortably 1,000 people, there were a council chamber, committee-room, and ante-room on the first floor. On the ground floor were the offices of the officials of the Council, curator's rooms, and in the basement were the plumbers' workshops and stores of the gas and water departments.

The public baths were provided in 1889 at a cost of 5,000l., and were erected under the joint supervision of Messrs. R. Castle and W. Howorth, architects, Cleckheaton; they ministered to a distinct want, and they were, doubtless, worth more to the community than their direct cost. The average expenditure per annum was 350l., and the receipts 170l. A singularity about the water in use at these baths was that it was pumped from old coal workings, and, after filtration, the water in the baths was seen to be of a beautiful transparency, and blue, rather than yellow, in tone. In nature, the water was heavily charged with oxide of iron, from which it was freed by upward filtration through a layer of foundry dross and breeze from coking ovens.

The stables and fire brigade were erected in 1890 at a cost of 3,000l. The author had been asked to inquire into the merits of motor traction for municipal work with a view to a report being drawn up and presented to the Council at an early date. Water was arranged for by purchase in bulk from the adjacent city of Bradford. A sum of 17,000l., raised to purchase distributing plant, had been wholly repaid, and in respect of its freedom from anxiety over water undertakings the town was to be congratulated. Water for domestic purposes was supplied at charges varying with

the rateable value of the consumer's premises. Water for one bath and one water-closet was supplied with no extra charge. Users for trade purposes were charged 11d. per 1,000 gallons, less discount at 5 per cent. if paid within one month of demand.

Previous to 1898, when the author was appointed, 16,000l. had been already spent in re-sewering the district under the direction of Mr. J. C. Haller, C.E., of Dewsbury. Since then 7,800l. had been expended, and an application for a further sum of 1,000l. now before the Local Government Board, would complete the sewers of the Cleckheaton and Scholes wards. The whole of the sewage from Cleckheaton ward was connected to the Liversedge trunk sewer, and was treated by that authority, under agreement for the sum of 900l. per annum. The sewage from Scholes ward was treated on about 10 acres of pasture land by broad irrigation, and that from Oakenshaw by precipitation with aluminiferous, the effluent then being passed over a bed of clinker from the destructor. The effluent from both these works was generally approved by the Rivers Board.

At the northern extremity of the burial ground a temporary iron structure had been erected as a small-pox isolation hospital. Another hospital within the Cleckheaton area had been provided and equipped at a cost exceeding 10,000l. to serve the united districts of Cleckheaton, Hunsworth, North Bierley, and Tong (the latter being now part of the city of Bradford) created under the Provisional Orders Confirmation Act of the Local Government Board (1888).

Attention to public health was displayed by the provision of three recreation grounds at West End, Moor End, and Scholes, of approximately 5 acres, 8 acres, and 3 acres respectively. In addition there existed several small open spaces.

The combined electricity and destructor works were opened on November 21, 1902, and were erected under the supervision of the author. The electrical equipment being under Messrs. Gibbings & Baker, of Bradford and London. The buildings might be briefly described as being built of red brick with stone facings, the roofs of the boiler-house and engine-room had iron principals, boarded and slated with Welsh slates. The destructor installation was by Messrs. Meldrum Brothers, Limited, of Manchester, and was known as the "Simplex Regenerative System." The destructor boilers were 16 ft. long and 7 ft. in diameter; two coal-fed Lancashire boilers, 30 ft. by 8 ft., were also housed there; the accommodation provided, in addition to the engine-room, being the electrical engineer's office, meter-room, workshop, battery-room, pump-room, with the usual lavatory accommodation; the chimney was 150 ft. high and 8 ft. internal diameter.

The total number of houses approached 3,000, and the total rateable value was some 21 per cent. below that of the gross estimated rental. The death rate from zymotic diseases in the last year recorded was the low one of 0.93 per 1,000, while infantile mortality returns indicated that the percentage of deaths at age less than one year was only 11.82 of the total of registered births.

Mr. Settle (Heywood) proposed a vote of thanks to Mr. Lund for his paper.

Mr. Wellburn (Middleton), who seconded, commented upon the District Council providing public laundries and the use by residents at a charge of 4d. per hour, and asked whether that included hot water and soap. There was a tendency at present to provide almost everything for working people, and he would like to know whether this was appreciated, and whether it was done at a profit or involved a financial loss.

Mr. Massie (Wakefield) pointed out that the 5 per cent. allowed by the County Council for establishment charges in connexion with main roads involved a liability for any accidents that might occur on the roads. With regard to the purchase of water in bulk from Bradford they might be told at what price per 1,000 gallons it was supplied to Cleckheaton, and whether it could be distributed at a profit, considering the moderate water rental.

Mr. W. H. Hopkinson (Keighley) asked whether the water from the old colliery workings used for the baths could be pumped cheaper than it could be purchased from Bradford.

Mr. A. M. Fowler (Manchester) said the question of trade effluents was a very important one, affecting the trade of the country. In

Manchester something like 36,000,000 gallons of effluent water flowed daily into the Ship Canal, and Mr. Gilbert Fowler, the analyst, and chemist, recently told him that the effluent they were now producing was fully up to the standard of the Irwell and Mersey Rivers Committee. If that was so, the effluent was practically as pure as some of the Thames water supplies, and some supplies in other parts of the country. Some thirty years ago he brought forward the question of supplying mill owners with water for trade purposes from the effluent water of sewage works. He had gone into the question of supplying this water to mill owners for condensing and manufacturing purposes, and he found it could be distributed at a cost of something like 2½d. per 1,000 gallons. If the effluent water was utilised, the mill owners would be helped by obtaining their water supply for trade purposes at a cheaper rate, and the demands upon the town supply for domestic purposes would be supplied. Manchester was near to a water famine until they got the third pipe line laid from Thirlmere to Manchester, yet the city authorities were selling the water to manufacturers for trade purposes while the public were almost starving for it. He urged municipal engineers to look into this question of the utilisation of the effluent waters, seeing what a great benefit it would be to mill owners to have a cheap supply for trade purposes.

The President thought the County Council of the West Riding of Yorkshire was acting very generously with the District Councils in allowing the whole cost of the maintenance of main roads. He was one of those who believed that the word "towards" meant something not quite the whole.

Mr. Lund, in replying to the discussion, stated that the charge of 4d. per hour for the laundry included hot water, soap, and the use of washing, wringing, and mechanical drying machines. The privilege was not appreciated to any great extent by the public. The cost of pumping the water from the swimming bath was 9s. for 50,000 gallons. They paid the Bradford Corporation 9d. per 1,000 gallons for the water supplied in bulk, and made a small profit on its distribution. They admitted trade effluents to the sewers, but required the manufacturers to keep back the solid matter. The manufacturers were very good in keeping back the solids by means of settling tanks, and they had nothing to complain of in that respect.

The Destructor Works.

Mr. Pickersgill then read a paper on "Cleckheaton Electricity and Destructor Works. In describing the destructor, he said:

"The destructor is of the well-known Meldrum regenerative type, and consists of two units each having its own combustion chamber regenerator and Lancashire boiler. Each unit has two grates, each of which has an area of 25 sq. ft. or 50 ft. in each unit. The capacity of each unit is 20 tons in twenty-four hours; this is equal to burning 37 lb. per sq. ft. of grate per hour. The front feed method of firing has been adopted, the refuse is tipped into bunkers opposite each unit and is then thrown into the furnaces by hand, the clanking is also done from the front, and so far the results have been satisfactory. The author is of the opinion that to further describe this portion of the undertaking would be useless, as most if not all the gentlemen present are fully conversant with this type of destructor. There is, however, a subject pertaining to this department which, when worked in conjunction with an electricity works, occasionally gives rise to considerable friction between the two departments in many towns. The author refers to the amount which should be paid for steam supplied to the electricity department from the destructor. There are several methods which have been adopted, but none seem to have given satisfaction. The author has, however, propounded a scheme which seems fair to both departments, and has been adopted by this Council as a basis for the conjoined working.

The arrangement is as follows:—The total wages paid for stoking is ascertained, and of this a sum of 218l. 8s. is debited against the electricity department as its proper share for stoking the coal fired boilers, the remainder being debited to the destructor department as being debited to burning the refuse. The proportion for stoking is now obtained, total cost of coal per unit sold is now obtained, and credit is given for steam supplied, so that the total cost per unit for coal shall equal 0.3 penny. The following example will no doubt

make the method perfectly clear. Suppose the total wages paid during the year for stoking amount to £500, of this total 218s. 8s. is paid by the electricity department as its share for the stoking of the coal fired boilers, the remaining 281s. 12s. being paid by the destructor department for burning refuse. Now assume that the total number of units sold are 480,000, and that the amount paid for coal is 400s., this would amount to 0.2 penny per unit sold; you now credit the destructor department with such a sum as will bring the total costs for coal to 0.3 penny per unit sold, thus leaving the net labour costs of destroying the refuse at 31s. 12s.

This method, the author thinks, is most equitable, he having taken several tests in order to find out what it cost in coal per unit sold when the destructors were shut down. It should never be overlooked by the members of any council, that the primary object in erecting a destructor is the proper and efficient destruction of the town's refuse, and that this should be carried out independently of any by-product or income from such undertaking. At the same time full value should be paid by any other department for steam or power which is supplied therefrom, and the method devised by the author seems to him to be a step in the right direction so far as a conjoined electricity and destructor works are concerned."

On the proposition of Mr. J. Parker (Hereford), seconded by Mr. E. J. Silcock (Leeds), a hearty vote of thanks was accorded to Mr. Pickensill.

The members were then entertained to luncheon at the George Hotel, and the afternoon was occupied with visits to the fire station, North Brierley Joint Hospital, the new cemetery, laitha gas works, and the combined electric and destructor works.

CARPENTERS' HALL LECTURES:

ST. LOUIS EXHIBITION.

The fifth of the present series of lectures on matters connected with building was delivered at Carpenters' Hall, London-wall, on Thursday last week, when Mr. H. Phillips Fletcher delivered his lecture on "The St. Louis Exhibition, 1904."

The Right Hon. Viscount Dillon, F.S.A., presided, and, in introducing the lecturer, referred to the remarkable growth and development of St. Louis during the past one hundred years and to the purchase of the Louisiana territory from Napoleon in 1803.

Speaking of the engineering features of the Exhibition, he said that a large amount of engineering work had to be executed before the site was ready for the buildings. Hills had to be lowered and valleys graded, and an artificial lake had to be drained and piled over; while a river had to be boxed in a "flume" 45 ft. wide by 15 ft. deep. The roads were covered with burnt ballast, gravel, macadam, asphalt, and brick. A total area of 5,800,000 sq. ft. was paved, and, taking this at an average of 25 ft. for the width of the roads, the total length of these works out at about fifty-five miles. All the kerbing throughout was of oak, 10 in. by 3 in. in thickness. The cascades and lagoons were built of timber, the central cascade being designed for a flow of 55,000 gallons per minute. The main exhibit buildings, of long leaf yellow pine, were mostly on spread footings, timber cribbing, or pile foundations, and the main walls were constructed of a double framing of timber posts, heads, oills, struts, and studding to a thickness of 2 ft. The columns and other features were also of a timber framework to the approximate shape required. Expanded steel sheets were nailed upon the wood, and fibrous plaster, known as "staff" in the States, was then applied. The timber roof trusses were mostly of the Howe type, the largest span being 105 ft., and were supported by timber columns. Many of these were composed of three posts with two sets of packing pieces between, all of which were bolted together and further strengthened with rows of white oak keys. These keys were circular, 2 in. in diameter, and were driven into holes bored after the timbers had been bolted together. After the keys had been driven home the bolts were tightened up. The English method of using a pair of wedges, thus forming a square key, was preferable, because they could be always tightened up; whereas the circular keys could not be tightened, and in some cases they fell out and damaged the timbers beneath. However, the adoption of the circular keys was perhaps justified, since

there was a great saving in expense; uniformity was insured by boring the holes with augers worked by compressed air. The lighting of all the main exhibit buildings was chiefly effected by means of skylights, clearstories, or lanterns. The Festival Hall was circular, being 195 ft. in diameter, with a large rectangular annex containing the stage, organ, accessory dressing-rooms, and offices. There was a large auditorium, covered by a dome 90 ft. in diameter, and a promenade was provided. There were also a gallery and a promenade constructed above that on the ground floor level, and tiers of boxes were constructed in the piers. Altogether seating accommodation was provided for 3,500 people. Externally this building was very ornate, as was no doubt fitting for the focal point of the Exhibition. The engaged Ionic columns of the circular colonnade were some 43 ft. in height, and rested on a podium 16 ft. in height. These columns were well modelled and were surmounted by an entablature and parapet decorated with vases. The dome, which was the crowning feature, rested upon a drum 140 ft. in diameter and two stories in height. The upper story was pierced with *ovais-de-bœuf*, which were very effective when viewed from a distance. The deeply recessed northern entrance, with its crowning group of statuary, was imposing, although it was not visible from most positions, owing to the statue of Liberty at the head of the central cascade being placed immediately in front of it. The Colonnade of States was an ornamental screen 52 ft. in height and one quarter of a mile in length, which formed a background to statues symbolical of the twelve States and two Territories included in the Louisiana purchase. This colonnade connected the pavilions and the Festival Hall architecturally, giving unity of feeling to the whole. The central cascade emanated from the Fountain of Liberty, immediately in front of the Festival Hall. A great statue of Liberty towered above. The two cascades in front of the restaurant pavilions were symbolical of the Atlantic and Pacific Oceans and the spaces between the cascades were laid out in gardens.

The lecturer then dealt with the main exhibit and other buildings, in the course of which he said that the architects were responsible only for the façades of the buildings, the construction being carried out by the division of works. This system of dividing the design and the erection of buildings appears at the present time to be obtaining some foothold in the States.

He thought every architect of standing in the country would agree with him that the most deplorable results would ensue if this idea was to be continued. The very name "architect" implied that he was the "chief workman," and he alone should be responsible for carrying into effect the ideas that emanate from his brain. Moreover, if an architect was to be merely a sketcher on paper, he could in no sense "design in beauty" and "build in truth," because he had not the necessary technical knowledge of the materials and craftsmanship which would enable him to treat his subjects with economy and sympathy; so that not only would untruthful buildings be erected under this system, but the client's pocket would suffer. Speaking of the Louisiana Purchase Monument, he said it was situated in the Plaza of St. Louis, at its intersection with the Grand Transverse Avenue. This position was rather unfortunate, as it interrupted the view towards the Festival Hall from the northern end of the Plaza. The shaft of the monument was 125 ft. high, and was surmounted by a figure of Peace inviting the nations of the world to friendly competition at this World's Fair. At the base were groups of statuary symbolical of the Mississippi and Missouri rivers, which are the great highways utilised in the extensive lumber trade of the United States. The sculpture of the Exhibition was designed on a magnificent scale, thus setting off the vast buildings.

The Exhibition of the future would probably be organised for single and specific purposes, and not upon a large general scale. It was generally agreed by European critics that the Chicago Exhibition of 1893 was too vast an undertaking to be really satisfactory in all its details. How much more did this apply to St. Louis, which was double the size! The fatigue entailed in seeing the Exhibition was simply enormous, and the glare of the buildings rendered smoked glasses an absolute necessity. The fact was that each building alone was an Exhibition in itself.

The one prevailing idea amongst Americans

of all classes was to have, or to build, the "biggest thing on earth," and to claim it whether they had it or not. If they would impart a little more thoroughness and a closer study of detail into their ideas, a more complete and harmonious creation would be the result. As examples of what was meant, he might perhaps mention that the model street was execrably paved, the hospital was placed next to the vibrating automobile shed, and at one of the entrances to the Exhibition one was almost compelled to go on all fours under a railway track to get to the turnstiles. As a further illustration, he might mention that when living at the palatial Club, at St. Louis, where swimming baths, a ballroom, and other luxuries were provided, the façade, though imposing, was so designed that the bedroom windows could not even be reached by the hand, and the floors of some of the rooms were at different levels. Some of the bathrooms were unventilated, and in one case both taps were fitted to the hot-water supply. At the Washington Hotel the steam exhaust from the laundry practically discharged into his bedroom window, and none of the plumbing pipes were of sufficient diameter for comfort.

Mr. Fletcher said he must admit that destructive criticism of a vast undertaking like this was superlatively easy, and he was much impressed by the fact that every day earnest people could be seen taking notes of machinery and goods that would be useful to them in their business. He admired immensely the pluck, the genius, and the overwhelming energy that were bestowed on the Exhibition, and many thousands of people were enabled to gain the most useful knowledge through its instrumentality.

A vote of thanks to the lecturer and to the Chairman brought the proceedings to a close.

THE SOCIETY OF ARTS AND THE LONDON INSTITUTION.

In reference to the subject of the proposed amalgamation of the Society of Arts and the London Institution, mentioned in our last issue, a word or two on the history of the two Institutions concerned, and of their respective habitations, may be of interest.

The Society of Arts was first established in March, 1754, at Rawthorn's coffee-house in Henrietta-street, Covent Garden; William Baker, the microscopist, drew up the rules; the founders were William Shipley, teacher of drawing; Viscount Folkestone, first President; Lord Romney, second President, and father-in-law of Viscount Folkestone; and Dr. Maddox, Bishop of Worcester. Removing in turn to Crane-court, Fleet-street, over a circulating library; Peele's coffee-house, at the corner (east) of Fleet-street and Fetter-lane; Craig's-court, Charing Cross (1755); Castle-court, Strand, opposite Coutts's (old) bank (1756); and the Strand, opposite Beaufort-buildings, now Savoy-court, the members migrated in 1774 to the house built for them in John-street, Adelphi, by Robert Adam. In 1777-83 James Barry, R.A., painted the six pictures for the council chamber, into one of which he introduced portraits of Shipley, Mrs. Montagu, Soame Jenyns, the Prince of Wales, the Duchesses of Rutland and Devonshire, Edmund Burke, Dr. Johnson, and others, and in that room he remains lay in state (1806). The Society owns full-length portraits of Lord Folkestone, by Gainsborough, and Lord Romney, by Sir Joshua Reynolds, and one of Barry. In 1843 the Prince Consort was elected President of the Society.

The London Institution, established in 1805-6 by a proprietary body for "the advancement of literature and the diffusion of useful knowledge," and incorporated in 1807, had its first home in what had been Sir Robert Clayton's house temp. Charles II., No. 8, Old Jewry, where Porson lived as librarian. In 1812 the library and offices were removed to King's Arms-yard, Coleman-street. Seven years afterwards the Institution migrated to the premises which Cubitt had built for it in the then Moorfields, opposite old Bethlehem Hospital, at a cost of 31,142s. Alderman Birch, Lord Mayor, laid the first stone on November 4, 1815. Behind the library, which is 97 ft. by 42 ft. and 28 ft. high, is the theatre or lecture-room, having a capacity for 700 persons. Adjoining are the apparatus-room and laboratory; a view of the latter, designed by W. H. Pepsy, F.R.S., is given in Parkes's "Chemical Catechism," 12th edition, 1826. The collection of books,

begun with a portion of the library of the first Marquis of Lansdowne, is uncommonly rich in English antiquities and examples of early printing. William Upcott, who in 1808 succeeded Porson as librarian, gathered the large collection of topographical works; a later librarian was Richard Thomson, author of the valuable compilation "The Chronicles of London Bridge," published in 1827.

METROPOLITAN ASYLUMS BOARD.

The usual fortnightly meeting of the Managers of the Metropolitan Asylums District was held on Saturday last at the offices, Victoria Embankment.

Brook Hospital.—The Finance Committee recommended, and it was agreed, to apply to the Local Government Board for sanction to incur an expenditure of 7,720*l.* on the installation of a "Economiser" plant at this hospital.

Milfield.—The Works Committee reported having instructed Messrs. Rowland Plumb & Harvey to prepare sketches and an estimate of the cost of the suggested alterations at this home. The action of the Committee was endorsed.

Eastern Hospital.—A plan of the proposed new boiler-house, destructor, and chimney shaft at this institution was submitted by the Hospitals Committee, and approved of by the Board. The work is estimated to cost 4,100*l.*, and the Works Committee were instructed to take steps for the execution of the work.

THE INSTITUTE OF BUILDERS.

The twenty-first annual general meeting of the Institute of Builders was held at the Registered Offices of the Institute, 31 and 32, Bedford-street, Strand, W.C., on Wednesday, when the report of the Council was received and adopted. From the report we take the following paragraphs:—

The City of London Corporation new by-laws, re Demolition of Buildings, referred to in the last Annual Report, have been approved by the Local Government Board. The united action of the R.I.B.A. and this Institute was successful in effecting some modifications in the original draft.

Representations having been made to your Council with reference to the erratic demands for payment made by public bodies for "Extraordinary Traffic on Roads," the question was taken up and your Council invited the co-operation of the Royal Institute of British Architects, the National Federation of Master Builders, the Surveyors' Institution, and other cognate bodies.

In consequence of a recent law-suit, your Council thought it desirable to suggest to the National Federation of Master Builders and to the Royal Institute of British Architects (co-signatories to the agreed Form of Building Contract) the desirability of amending the wording of Clause 12a in the Form where the Quantities are made part of the Contract. The suggestion of your Council has been referred by the former body to a Committee for consideration and report, and the latter body has the matter under view.

The audited accounts and balance-sheets of the Institute general and benevolent funds for the year ending December 31, 1904, were then adopted.

The following officers were elected for the ensuing year:—As President, Mr. Benjamin J. Greenwood; as Vice-Presidents, Mr. Woodman Hill and Mr. Jas. Carmichael; as Hon. Treasurer, Col. Stanley G. Bird, C.B.; as Hon. Auditor, Mr. F. Maitland May.

The following five members were elected to serve on the Executive Council, i.e., Messrs. G. Kett, J.P. (Cambridge), F. Higgs (London), W. Sapote (Birmingham), F. G. Minter (London), and C. E. Skinner (Chatham).

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. E. A. Cornwall, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Camberwell Borough Council 1,542*l.* for improvements and 4,100*l.* for erecting working-class dwellings at Grove-vale, and Lambeth Borough Council 1,483*l.* for paving works. Sanction was also given to the following loans:—Deptford Borough Council, 4,300*l.* for the construction of a footbridge and for street improvements; Hackney Borough Council, 3,365*l.* for street lighting purposes; Hammer-smith Borough Council, 200*l.* for an advance under the Small Dwellings Acquisition Act, 1899; and Islington Borough Council 18,575*l.* for paving works.

Non-Provided Schools: Structural Condition.—On the recommendation of the Education

Committee, the following recommendations were agreed to:—

"That a statement of the facts with reference to the condition of the St. Mary's (R.C.) School, Gate-street, Lincoln's-inn-fields (Holborn), be communicated to the managers of the school; and that they be informed that, in the opinion of the Council, the premises are unsuitable, from the point of view of structure, for the purpose of elementary education, and are absolutely dangerous in case of fire or panic.

That a statement of the facts with reference to the condition of the St. Mary's (R.C.) School, Gate-street, Lincoln's-inn-fields (Holborn), be communicated to the Board of Education, and that they be informed that the Council is unable to regard the school building as providing suitable accommodation beyond April 30, 1905.

That, in pursuance of sec. 7 (1) (d) of the Education Act, 1902, and the Education (London) Act, 1903, the managers of the Northbrook (N.) School, Hodgeley-street, Lee, be required to make alterations and improvements in the premises at the earliest possible date."

Erection of Buildings between No. 108, Kensington High-street and Holland-walk.—The Building Act Committee recommended as follows with reference to the line of frontage proposed to be adopted for new buildings to be erected by Sir Walter Phillimore, Bart., between No. 108, Kensington High-street and Holland-walk:—

"That the Council of the Royal Borough of Kensington be informed that the Council would be prepared to favourably consider an application by Sir Walter Phillimore, Bart., for the consent of the Council under the London Building Act, 1894, to the erection of buildings between No. 108, Kensington High-street and Holland-walk, to the line shown on the plan accompanying the letter from the town clerk of Kensington, dated January 13, 1905, as modified by a line drawn from a point 4 ft. in advance of the western angle of No. 114, Kensington High-street, to the western angle of the free library, subject to the conditions agreed upon between the Council of the Royal Borough of Kensington and Messrs. Chesterton, Sons, and Sir Walter Phillimore, as set out in the letter from the town clerk dated January 13, 1905, being complied with."

The scheme is, approximately, to erect a long row of shops 9 ft. in advance of the present building line, and as a *quid pro quo* the freeholder agrees to surrender to the public way the strip of land in advance of the proposed new building line, having a width varying from 13 ft. to 16 ft. The scheme involves the whole block of buildings between 108, Kensington High-street and Holland-walk.

Mr. Dickinson moved, and Mr. Shephard seconded, an amendment declaring that the Council was unwilling to allow any part of these buildings to be brought beyond the present building line.

Sir M. Beachcroft said that, if this recommendation was sent back, freeholders would know that there was no compromise in this matter of the variation of the building line, and thereby the improvement of London would be retarded for many years.

Mr. Taylor said that, in exchange for permission to build over 12,000 sq. ft. of land, Sir Walter Phillimore was proposing to give up 30,000 sq. ft. for the public use free of all cost.

The amendment was carried on a show of hands.

The proposal was consequently rejected. **Mountsfield Park: Extension and Completion of Laying Out.**—The Parks and Open Spaces Committee recommended, and it was agreed:—

"That the estimate of 2,115*l.*, submitted by the Finance Committee, be approved; that expenditure not exceeding that amount be authorised for the completion of the laying out works at Mountsfield Park and its extension; that the Parks Committee be authorised to invite tenders in connexion with the works; that any necessary contracts be entered into; that the solicitor do prepare and obtain the execution of such contracts, and that the seal of the Council be affixed thereto when ready."

London Building Acts (Amendment) Bill, 1905.—The Parliamentary Committee reported as follows:—

"We report that, as the result of a compromise arrived at at the House of Commons between the members of the Committee in charge of the London Building Acts (Amendment) Bill and of the City of London (Escape from Fire) Bill and other opponents of the Council's bill, it was agreed to drop all parts of the Council's bill with the exception of Part VIII. (Means of Escape from Fire).

We are satisfied that there was no possible chance of the bill passing second reading as it stood, and that therefore, as the whole of the bill would in most probably been rejected, the course taken was, in the circumstances, the best which could have been followed. It would, in our opinion, have been regrettable if, because the Council was unable to pass the whole bill this year, it had therefore declined to avail itself of the opportunity of placing before the Committee of the House its proposed amendments of the law as to means of escape from fire. As a result of the compromise, so much of the Council's bill as deals with the means of escape from fire, and the City bill, will be referred to the same Select Committee for consideration."

Captain Hemphill, Chairman of the Building Act Committee, asked that the paragraph be postponed, as the Building Act Committee wished to bring up a report on the subject and to express their regret at what had been done. This was agreed to.

Public Clocks.—Replying to a question by Mr. Horniman, Captain Hemphill said that the Committee had considered the question of insisting upon the synchronisation of all public clocks, but felt that the difficulties in the way were too great. The Committee were glad to do all they could to encourage the multiplication of synchronised clocks, and were anxious to do nothing to discourage their increase.

The Council adjourned soon after seven o'clock.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Strand.—An iron and glass shelter to the "Coliseum," St. Martin's-lane, Strand, to abut upon May's-buildings (Messrs. F. Marchant & Co. for the London Coliseum, Ltd.).—Consent.

Chelsea.—A projecting sign at No. 15, Brompton-road, Kensington (Messrs. King & King).—Consent.

Clapham.—An additional one-story shop on forecourt of No. 43, Old Town, Clapham (Mr. H. T. Cook for Mr. H. Dunning).—Consent.

Hampstead.—That the application of Mr. A. Whitlaw for an extension of the period within which the erection of a one-story shop on the north-east side of High-road, Kilburn, southward of Brondesbury station, was required to be commenced be granted.—Agreed.

Kensington, South.—A projecting hood over the doorway of No. 39, Kensington-square, Kensington (Mr. G. D. Martin).—Consent.

Marylebone, East.—Retention of a projecting balcony at No. 6, High-street, St. Marylebone (Mr. A. Skyes for Messrs. Lilley & Skinner, Ltd.).—Consent.

St. George, Hanover-square.—A projecting sign at No. 171, New Bond-street, St. George, Hanover-square (Mr. J. D. Young for Mr. E. Collins).—Consent.

Strand.—The retention of a projecting clock at Nos. 3 to 7, Southampton-street, Strand (Mr. E. L. Luytens for Sir George Newnes, Bart.).—Consent.

Lewisham.—Houses with bay-windows on the north side of Belmont-hill, Lee, westward of "Moray House" (Messrs. H. & G. Taylor).—Refused.

Lewisham.—A one-story addition at the side of No. 13, Queens'-gardens, Brownhill-road, Catford, to abut upon Argdown-road (Mr. R. J. W. Hider for Dr. D. Duncan Tindal).—Refused.

Southwark, West.—One-story shops on the forecourts of Nos. 46 and 48, Westminster Bridge-road, Southwark (Messrs. F. Taperell & Haase for Mr. P. Barnes).—Refused.

Width of Way.

Hackney, South.—A one-story building at the rear of No. 107, High-street, Homerton, with external walls at less than the prescribed distance from the centre of the road of Belshaw-street (Mr. W. E. Park for Mr. G. M. Hildyard).—Consent.

Width of Way and Lines of Frontage.

Camberwell, North.—Three houses on the west side of Marlborough-road, Old Kent-road, Camberwell, southward of No. 1 (Mr. J. Whitaker).—Refused.

Kensington, South.—An enclosed covered way at No. 8, Cambridge-place, Victoria-road, Kensington (Messrs. Totten & Willert for Mr. H. D. Rowley).—Refused.

Marylebone, East.—A warehouse at Nos. 373 and 381, Euston-road, St. Marylebone, to abut also upon Cleveland-street (Mr. F. M. Elgood for Mr. J. A. Michell).—Refused.

Width of Way, Line of Frontage, and Construction.

St. Pancras, South.—Two iron ganeways at the third and fourth floors and alterations to an existing ganeway at the second floor of premises on the north and south sides of Beaumont-place, St. Pancras, so far as relates to the erection of enclosures and a hood to the ganeway at the third floor (Messrs. Maple & Co., Ltd.).—Consent.

Formation of Streets.

Wandsworth.—That an order be issued to Mr. A. Wellings, refusing to sanction the formation or laying out of new streets for carriage traffic out of Footing Bee-road and Upper Footing-road, Upper Footing, Wandsworth.—Refused.

Deviation from Certified Plans

Strand.—A deviation of the plans sanctioned

for the rebuilding of Nos. 118 and 120, War-don-street, Strand, so far as relates to a modification in the erection of the new building (Mr. W. Woodward for Mr. J. Newell).—*Consent.*

Means of Escape at Top of High Buildings and Construction.

St. George, Hanover-square.—Means of escape in case of fire, proposed to be provided in pursuance of section 63 of the Act, on two stories of the rear block of No. 33, Dover-street, Piccadilly, abutting upon Berkeley-street, for the persons dwelling or employed therein, and an iron and glass gangway at the level of the topmost story (Mr. J. S. Gibson for Messrs. House, Ltd.).—*Consent.*

The recommendations marked † are contrary to the views of the local authority.

ARCHITECTURAL SOCIETIES.

GLASGOW ARCHITECTURAL SOCIETY.—At the meeting on the 16th inst., a paper was read by Mr. John Honeyman on "Certain Peculiarities in the Architecture of Iona." He said that so much had been written, descriptive and historical, about Iona, since the days of Lennart and Pocock down to the days of Champneys and Principal Story—late President of the Society—that on the present occasion he would strictly confine himself to some reference to peculiarities of arrangement or treatment which the existing remains exhibited, and he found that within reasonable limits he could only mention some of these. There was nothing peculiar about the plan of the Cathedral, as it existed now. The cloister was on the north side, but the contour of the ground accounted for that, as in many other cases. There existed, however, fragments of an older church at the north-west corner of the nave. There was a semi-circular headed door, which had been built up after all the freestone parts had been removed, and there was also a very peculiar structure connected with the old wall, namely, the lower portion of a tower, the entrance to which was by a small door, the sill of which was nearly 8 ft. above the ground. In this it resembled the round towers and a few square ones built in the XIIIth century and earlier. But it had this very unusual peculiarity, that it was built solid up to the level of the small entrance door. In the north wall of the choir there was a very unusual feature, two arches springing from abutments at each side and resting on a circular column 2 ft. 6 in. in diameter, the base of the column and the sill of the arcade being 6 ft. 3 in. above the level of the choir floor. Outside there was what now appeared to be a side aisle, to which access was obtained by a very beautiful door of much later date than the arcade. Although, after the insertion of this door the floor had been at nearly the same level as that of the choir, and the place was used as a sacristy, there was evidence that originally the floor was much lower, as during recent operations the remains of a floor 4 ft. 6 in. lower were found, and a piscina in the main wall of the building near the level of the present floor showed that there was here a chapel at a lower level. After explaining in detail and with the aid of illustrations what had led him to this conclusion, Mr. Honeyman said that he had come to the conclusion that at one period there had been a crypt at the east end of the cathedral, probably something in plan, though not other-wise, like that at Hexham, and that at that period the floor of the choir was 6 ft. 3 in. higher than at present, and that a side aisle existed on the north side. The window in the east wall of this aisle had a triangular head. After referring to the very beautiful and peculiar window in the east gable of the south aisle (just restored) the peculiar flying buttresses in that aisle, the archaic character of the arcade in the north transept, the evidence that the church had a flat ceiling, resting on corbels still existing about 4 ft. below the wall-heads, with apartments over it, as at Turpinchen, Lincluden, and elsewhere, reference was made to peculiarities in the chapter-house and cloisters. He thought it probable that the north side next the oldest part of the wall was much the same as the corresponding cloister at Oransay, but the other three sides were—as remaining fragments proved—on the beautiful wall of one of the older Italian cloisters, the wall being carried on a continuous succession of smaller arches on coupled shafts, as, for example, at Amalfi, where the same arrangement, namely, a group of four detached shafts with bases and capitals respectively wrought

on one stone, was to be found. At Iona the inner shafts were circular and the outer ones octagonal, but these latter had this remarkable peculiarity, that they were thicker in the middle by 1 in. than at either end, and had the heads at either end wrought on the shaft. Attention was next drawn to peculiarities in the belfry. The most remarkable of these was the treatment of the windows, which were filled with flowing tracery, while the inner face of the wall was carried on two flat rear arches, the springer between the two resting on a column of peculiar design. It had been surmised by some that these formed part of an older structure, probably of Norman date, but the lecturer did not favour that idea. He had no doubt they had been specially designed for the place they had to occupy, and their old-fashioned character was quite in keeping with much that had been done there even after the XIVth century, to the perplexity of Pugin and Parker. Above the belfry there was a chamber designed to be a dove-cot. There were small openings for light and air and larger ones for the pigeons, and a liberal supply of pigeon-holes built in the inner face of the wall in the usual way. It was possible that the position of the floor of this chamber suggested the squatness of the belfry windows, just as the position of the upper chamber in the church explained why the arches at the crossing and the windows in the gables are all kept so unusually low. The pigeon-holes in the walls of the tower had suggested a new idea, namely, that in our larger towers the comparatively useless space between the first floor and the belfry floor might be divided into columbaria, honey-combed with "cells" for the reception of urns containing the ashes from the crematoria when churchyards were abolished. He thought it would pay when people became a little more enlightened. In conclusion, he referred to certain earthworks a little to the north of the cathedral enclosure, and expressed the opinion that they had nothing to do with the works of Columba and his successors, but that they marked a very strong position occupied by the natives, and probably so occupied long before Columba's time. In the absorbing interest which the work of the great missionary saint inspired, they might be excused if they were prone to forget that the island of Iona had a history before his advent.—The paper was illustrated by drawings and photographs, and several plaster casts of monuments, lent by M. Alex. Ritchie, were exhibited.

LEICESTER SOCIETY OF ARCHITECTS.—At a general meeting of this Society, held on the 15th inst., the following resolution was passed:—"That we, the Leicester and Leicestershire Society of Architects, at a general meeting called to discuss the subject of Statutory Qualification and Registration of Architects, do re-affirm our resolution of June 3, 1904, and are of the opinion that it is the duty of the council of the Royal Institute of British Architects, as representing the profession, to make serious and immediate effort to obtain Parliamentary powers for the purpose of establishing Statutory Qualification of Architects."

Fifty Years Ago.

THE COLOSSEUM, REGENT'S PARK.—When the Colosseum, in the Regent's Park, with the Cylorama, in Albany-street, were put up to auction, at the Auction Mart, by the Messrs. Winstanley, the other day, the auctioneer stated that the Colosseum was erected after a design by Mr. Decimus Burton, at a cost of 23,000*l.*, for Mr. Thomas Horner, who held a lease of it direct from the Crown, at a ground rent of 262*l.* 18*s.* for a period of ninety-nine years, sixty-nine of which were unexpired on October 10, 1854. He subsequently expended above 100,000*l.* to carry out the objects for which it was intended, by decorating the interior, purchasing the pictures, etc. In August, 1836, the lease was sold to Messrs. Braham & Yates. Mr. Braham laid out about 50,000*l.* on the building, which in a few years became the property of Mr. Turner, who added the Cylorama, which cost 20,000*l.*, to the establishment, with many decorations, which cost several thousand pounds, so that the entire edifice has cost above 200,000*l.* The sum of 20,000*l.* was bid, but this was below the reserve price, the property was not sold.—*The Builder*, March 24, 1855.

THE ROYAL ACADEMY.—Mr. E. M. Ward has been elected an Academician; a better choice

could not have been made.—Professor Hart's Lectures on Painting are being published in *extenso* in the *Athenæum*, and well deserve study.—*The Builder*, March 24, 1855.

Illustrations.

EXAMPLES OF FRENCH MEDAL ENGRAVING.



THE medals which are engraved here are the property of Mr. R. Phené Spiers, and on looking over them with him we thought that it would be a good opportunity to give some illustrations of French medal engraving, an art in which French artists are superior to all others.

The most interesting example is the tablet presented to M. Pascal by his former pupils when he retired from his atelier, for this is the work of M. Chaplain, who may be considered to be at present the first medallion artist in the world. It is impossible to convey in the reproduction a full idea of the delicacy of the modelling of the foliage and other details on the reverse of the tablet; it must be seen in the round to be fully appreciated. The dates on the escutcheon hung on the tree represent the duration of M. Pascal's directorship of the atelier. The line engraved—

"Abrités par son ombre et nourris de sa sève" gives the clue to the symbolism of the introduction of the tree. The line is, we believe, de Musset's, but we have not had time to look it up.

Of the other two medals, the one at the foot of the page was presented to Mr. Spiers by the Société Centrale des Architectes as an acknowledgment of the value of his paper on the Moorish vault, and the obverse represents one of the sculptural symbols of architecture which the Société Centrale has adopted. This is the work of M. Oudiné, a well-known French medallist. The other and more elaborate one at the top of the page is apparently the medal given on admission to membership of the Société Centrale; this is also executed by M. Oudiné, but it was specially designed by the eminent architect, the late M. Constant-Dufeux; the only case we know of in which a medal of this kind has been designed by an architect. Constant-Dufeux won the Grand Prix de Rome in 1829, and was successively architect to the Panthéon, the Luxembourg, and the Château de Vincennes. He was also professor of perspective in the École des Beaux-Arts.

"ENFANTS ET GRENOUILLES":

PLASTER GROUP FOR A FOUNTAIN.

This charming and playful bit of sculptor's fancy stood near the principal entrance to the sculpture hall of the Paris Salon last year. It represents a group of three children perched above a fountain basin and amused by watching some frogs on the opposite margin of the basin. We have given another and larger view of the group below. M. Max Blondat is the sculptor.

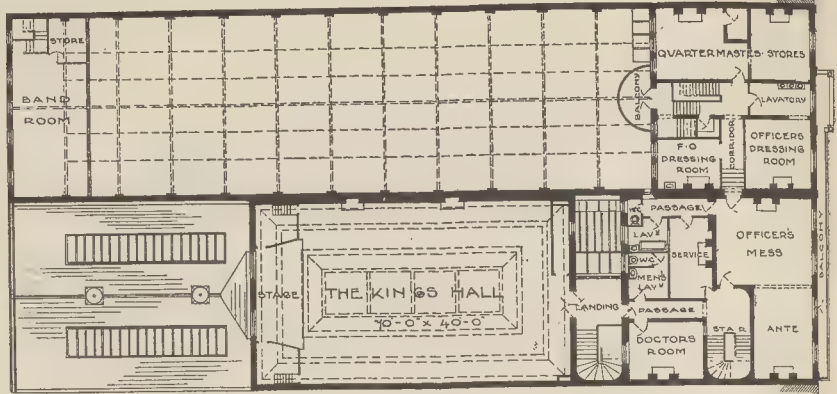
The natural attitudes and expressions of the children attracted the notice of every visitor who passed the group, which before the close of the exhibition was purchased by the Government.

A PAGE FROM THE ARCHITECTURAL ASSOCIATION SKETCHBOOK.

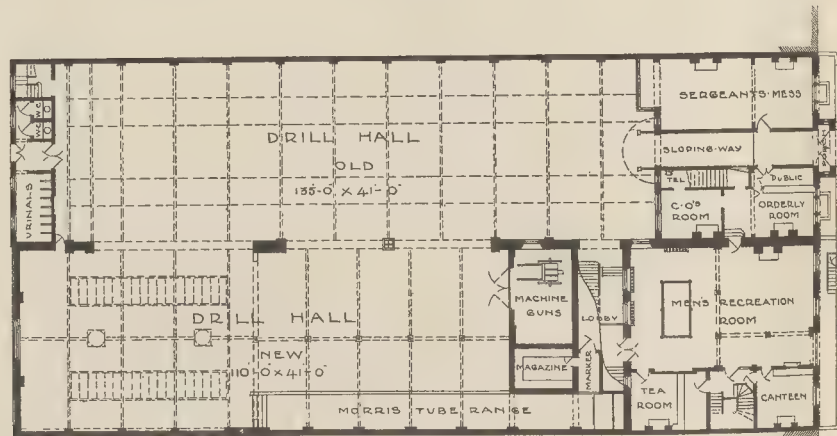
The eighth volume of the Architectural Association Sketchbook is reviewed on another page of the present issue. We give a reproduction from the plate showing the arch of Trajan at Benevento, drawn by Mr. Theodore Fyfe, as an example of the contents of the new volume. Mr. Fyfe sends us the following notes on the subject of his drawing:—

"The arch at Benevento (now Benevento) was erected by the Roman Senate in expectation of Trajan's return from the Parthian War. The date of the structure is, therefore, about 114 A.D., and certainly before 116 A.D., as the title 'Parthico' does not occur in the inscription. Trajan himself died in 117 A.D., and never saw the arch. But his was a great age of building activity—witness the famous pillar of Trajan at Rome, the arch at Ancona, the mole at Civita Vecchia, and the bridge over the Tagus at Alcantara.

The Benevento arch is not as well-known as it ought to be. As Fergusson has pointed out, it is the finest Roman arch in Italy, possibly anywhere, and its sculpture is unrivalled among Roman monuments. Gibbon ('Decline and Fall,' Chapter XIV.) was in error when he



Upper Plan.



Ground Plan.

Headquarters of 1st V.B. King's Liverpool Regiment, Liverpool. Plans.

stated that the sculpture of this arch was removed to decorate Constantine's new arch in the Forum. It is quite apparent that the sculpture on the Benevento arch is complete.

The sketch shows the inner or town side of the arch, selected because of an easier viewpoint. But outside the impression is grander, as after a winding approach round the town walls, the arch is reached by a straight ascent between vineyards, so that the full effect of height is gained.

It is constructed entirely of white (probably Parian) marble, now much blackened with age. The upper cornice, and possibly some end portions, have been restored satisfactorily, but otherwise the structure is complete, and has weathered almost equally on outside and inside.

The sculpture mostly represents scenes from the life of Trajan. In the arched spandrels are two winged victories, and the outside spandrels have a river god and goddess, one of which is probably the Danube. The magnificent keystone should be noticed.

The jointing of the marble work is interesting. The actual arch has six *vousssoirs* and a wide keystone, but the middle *vousssoir* of each half embraces the top part of the shaft of the adjacent engaged column, and is cut to meet the curve of the projecting capital. On each pier there is a block which takes in the two capitals and the carved space between them.

The architectural details throughout are very good. I obtained no dimensions, but the scale of the arch can be roughly judged from the figure seated at the foot of the right pier."

HOUSE NEAR RUGBY.

We gave in our issue of March 11 Mr. Simpson's drawing of this house, which had been exhibited at the Royal Academy. The present illustrations are from photographs taken from the actual building.

The plan and description of the house were given in the issue of March 11.

VOLUNTEER HEADQUARTERS, LIVERPOOL.

We illustrate this week the headquarters of the 1st Volunteer Battalion King's Liverpool Regiment as recently altered and enlarged by the purchase of the old premises of the Odd-fellows' Society, which adjoined the old headquarters in St. Anne-street.

The result of the alterations is that the regiment now possesses ample accommodation for all ranks of its establishment of 1,500 men. The difference of levels in the old houses has been overcome to a large extent and an effective elevation produced by the use of balconies, arcades, cornices, etc. The plans show that there is ample floor space for the drilling of men, the storage of arms, ammunition, and clothing, and offices for regimental work.

In the officers' messrooms on the first floor the old white marble chimney-pieces and mahogany doors from the old house are introduced. The sergeants' messroom is on the ground floor. The men's recreation-room is a feature of the new scheme, and there is a billiard-room, bar, service and tea rooms, etc.

Another feature provided is the old hall on the first floor, over the drill shed. This room

is used, as the "King's Hall," for a gymnasium, band, and lecture hall, and also for social gatherings for officers and men. Residences for the sergeant-major and other members of the staff are situated on the second floor. A "Morris Tube" range is provided on the south side of the drill shed, with fireproof marking place, sliding, interchangeable targets, speaking tubes, etc., and is found to work very well.

The building is electric lighted throughout and heating pipes are introduced in the "King's Hall" and in the armouries and workshops.

The amount of the grant from the Public Works Loan Commissioners for the purchase of freeholds and alterations to buildings was 8,500*l*. A separate fund was raised for the furnishing and decoration.

Mr. W. Hall was the general contractor, and the architect was Mr. Francis U. Holmes, who is the colonel-commandant of the regiment.

FOLKESTONE TECHNICAL SCHOOL.

This building was provided by the Town Council, and affords accommodation in the basement for a kitchen and scullery for the use of the cookery classes; also a chemical laboratory and masters' room, with lavatories, heating apparatus, and domestic offices; on the ground floor there is provided a physical laboratory, science lecture-room, and lavatory; on the first floor are elementary and advanced drawing-rooms, masters' room, and cloakroom, and on the second floor a life classroom, with dressing and painting rooms and stores, and a large flat roof, used for outdoor painting.

The school gives accommodation for sixty-

six cookery students, and 106 science and 150 art students.

The four fronts are faced with local red bricks, with a liberal use of Corsham down stone for dressings. As the ground falls considerably towards the back, the foundations have been set on to a great depth, as much as 40 ft. in the rear of site.

The total cost, including site, was 11,506*l*. The builder was Mr. T. M. Moody, and the architect Mr. Frank Newman, both of Folkestone.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The fifth meeting of the session was held at 32, St. Andrew's-street on Wednesday, the 15th inst., Dr. W. de Gray Birch in the chair. The Chairman exhibited, on behalf of Mr. W. E. A. Axon, a fine photograph and several other illustrations of the very curious sculptured stone which was found during alterations in the foundations of the west wall of the south porch of Manchester Cathedral, in 1871, and is known as the "angel cuneus." The stone measures 13½ in. by 8½ in., and represents an angel, with extended wings, standing and holding a kind of scroll bearing an incised inscription, which Canon E. L. H. reads as follows, viz:—

IN MANVS T
VAS DM CO
MMED SP

"In manus Tuis Domine commendo spiritum" (ground). Considerable difference of opinion exists as to the real meaning of this stone and its date, and no completely satisfactory solution has yet been arrived at. A squeeze of the inscription and a carefully drawn full-size reproduction of the stone with a suggested completion of the defaced lower portion, by Mr. J. J. Phelps, were also exhibited. In Dr. Birch's opinion the sculpture and inscription belong to the VIIIth or IXth century, forming part of a larger work representing the Crucifixion. The stone is being carefully preserved by the cathedral authorities. The Rev. Dr. Astley exhibited, on behalf of Mr. Ludovic M. Mann, some sixty objects, many of flint, others of sandstone and quartz, part of a collection of about 1,200, found at Coulmore in the south of Scotland, on the site of a supposed pre-historic workshop. They are of the Neolithic Age, and consist of a large anvil and hammer stones of quartz, a rubbing stone of red sandstone, and many scrapers, pointed tools, flaking tools, knives, notched flakes, and arrow points, one being barbed and stemmed, another leaf-shaped. One curious feature of the find is that some of these implements seem to have been handed at a period earlier than that in which the workshop flourished, as they show evidence of the presence of two distinct patinas on the worked surfaces; some also show signs of fire. No pottery was met with. This exhibition was very interesting in connexion with finds made recently by Dr. Astley and Mr. Andrew in earthworks at Castle Rising in Norfolk, evidencing a similar Neolithic workshop there. Dr. Astley also submitted some "lucky stones" and a perforated hammer from the Fens. Mr. Selley, through Dr. Astley, sent for exhibition some portions of Samian ware showing signs of fire, which were found near the site of East Gate, Exeter, at a depth of 10 ft. He also showed some pottery from the site of a Roman villa recently unearthed at Basington near Bristol.—A paper was read by Mr. C. H. Compton, V.P., on "Villa Faustini," with reference to a letter in the *Standard* of Sept. 10, 1904, by Mr. Barham, of Bury St. Edmunds, in which that gentleman, describing some Roman remains he had found some three weeks previously at Sicklemeare, about two miles from Bury, raised the question whether that discovery had not localised the position of the "Villa Faustini" of the Itinerary of Antoninus. Mr. Compton said the locality of this villa has been a subject of much controversy. It is nowhere else mentioned in the Itinerary than in the fifth iter, and it is the third station in that iter. The Rev. Dr. Raven controverts Mr. Barham's hypothesis on the ground that the measures of distance in routes are and nine of Antonine's Itinerary preclude the location of Villa Faustini at the spot indicated by him. Mr. T. Coddington in his book on Roman roads in Britain, although not seeking the identification of the Villa Faustini, goes into the question of the distances from Colchester, which may be very helpful. Mr.

Compton had carefully measured the various distances on the one inch to the mile ordnance maps and compared them with the distances given in the Itinerary (assuming Colonia to be Colchester), and with those given by Dr. Raven and Mr. Coddington, taking as a basis 1,618 Roman yards to 1,760 English yards to the mile, and although he had not been successful in locating Faustinus' villa at the 35 miles distance from Colonia which was required, he hoped that the materials he had worked out would prove useful in determining the point at issue in the event of future discoveries, and he thought thanks were due to Mr. Barham for drawing attention to his interesting discoveries. Mr. Forster, Mr. Emmanuel Green, Rev. Dr. Astley, Mr. Maples, and the Chairman joined in the discussion which followed.

COMPETITIONS.

FREE LIBRARY, NELSON.—In this competition, for which 207 designs were sent in, the assessor, Mr. G. H. Willoughby, F.R.I.B.A., has awarded the premiums as follows: First premium, Messrs. W. Brandreth Savidge, and J. R. Poyser, joint architects (Nottingham); second, Messrs. David Bird (Manchester) and G. Fox (London), placed together; third, Mr. H. T. Rees (Liverpool). The assessor speaks very highly of the first premiated design, observing that "as a practical up-to-date, working library for a manufacturing town like Nelson it would, in my opinion, be hardly possible for the general arrangements to be much improved upon. It is evident the author has thoroughly mastered the salient points to be striven for in the successful planning of a Town Library."

BOOKS RECEIVED.

THE SANITARY INSPECTOR'S HANDBOOK. By Albert Taylor. Fourth edition. (H. K. Lewis. 6s.)

Correspondence.

"BANISTERS."

SIR,—How frequently nowadays we see in the newspapers the misused word "banisters" instead of "balusters." We do not hear of "banistrade," the form "balustrade" being properly used. Many may have noticed this; but, so far as I know, no one has thought it necessary to correct so curious an error, the origin of which is somewhat obscure.

E. SWINFEN HARRIS.

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE-STEEL.—XII.

MAISON DE RAPPORT OF SEVEN STORIES.

AN excellent example of reinforced construction as applied to dwelling-houses in Paris is to be found at No. 29, Avenue Rapp, a street running from the Avenue de la Bourdonnais, on the north-eastern side of the Champ de Mars, to the Pont de l'Alma.

This structure, of the class known in France as *maisons de rapport*, is practically a residential hotel, and was built by MM. Combes et Lavrotte, a Parisian firm of architects, with the co-operation of M. Cottancin as structural engineer. Fig. 87 is an outline section through the principal façade, and gives the height of the different stories, and Fig. 88 is a plan of the third story, which serves to indicate the general arrangement of the building. In order not to depart altogether from the methods of construction generally followed in Paris, the architects decided to employ cut stone for building the basement walls, the masonry being carried up to the first story on the façade upon the street and to the street level on the façade upon the *grande cour*, or interior court. The adoption of stone precluded the application of reinforced construction for these portions of the building, and the walls of the cellar were built in ordinary masonry up to the ground level of the court, with the exception of certain details which are described below.

The walls of the small courts, distinguished (see Fig. 88) as the *petite cour* and the *courrette*, of the grand staircase, and of the service staircase are in reinforced brick, all 11 centimetres

thick. Four columns in the vestibule, standing upon a caisson foundation at the level of the basement floor, are of reinforced brick with a cross-section of 22 centimetres square up to the level of the ground floor. These slender columns support, together with the *courrette*, the lift casing and the enclosure of the grand staircase nearly all the weight of the front portion of the building. The walls of the *courrette*, of the lift casing, and of the grand staircase are all in reinforced brick of the thickness mentioned above. In the vestibule the square columns have been brought to cylindrical form by an outer coating of cement, stuccoed and decorated to imitate the marble panelling of this apartment.

Those walls which are of reinforced brick, as well as the four columns, are built upon caisson foundations very similar to those described in Art. VIII., p. 213, the sides of the caissons being of reinforced brick 11 centimetres thick, with a cover formed by a slab of reinforced cement 5 centimetres thick.

Under the walls of the building in the Avenue Rapp the footings are 30 centimetres wide by 40 centimetres deep. Fig. 89 is a perspective by which it will be seen that the sides of the caisson consist of five courses of brick, each 7 centimetres high by 11 centimetres wide. The bricks in the wall standing upon the reinforced slab are of the same dimensions, and are reinforced by steel wires of 4½ millimetres diameter (No. 20 French gauge) passed through the holes, which are afterwards filled up with cement mortar. These wires are tied with horizontal wires of the same gauge laid in the joints to form a network capable of taking all tensile stresses developed in the structure. The number of wires used in the vertical holes and in the joints of the bricks is proportioned so that adequate resistance shall be insured in all parts of the wall.

In places where the number of wires necessary may be too great to permit them to be woven into a network, the practice is to use a bar of steel of the required dimensions in place of a bundle of wires.

The reinforced brick walls of the *petite cour*, the *courrette*, the grand staircase, and the service staircase, all built in the manner here described, extend from the basement to the eaves—that is, through eight stories in all.

For the four columns mentioned above, the foundations consist of caissons 70 centimetres square by 40 centimetres deep, the upper slab being of reinforced cement 5 centimetres thick. Fig. 90 is a perspective sketch of a typical foundation, with a portion of the column. The sides of the caisson consist of four brick walls 11 centimetres thick, all reinforced by steel wires of 4½ millimetres diameter, these being securely connected with the steel network of the cement slab. The column, of which a few courses are shown in the same illustration, is built with two bricks in each course, the joints of alternate courses being at right angles so as to give a proper bond. The reinforcement at the corners consists of bars of steel, and in the other vertical holes of 4½-millimetre steel wire. As in the case of the column section in Fig. 78, p. 301, the vertical reinforcement is interwoven with horizontal wires, and the four corner bars are connected by diagonal ties.

The load upon the reinforced walls and columns is very considerable, since the floor loads are transmitted chiefly through them to the foundations.

All the floors of the building, from the basement to the top story, are formed of concrete-steel, the same material being used for the flat portions of the roof and for the paving of the courtyard, which is intended for use by carriages and motor-cars. Each floor is finished with a slab of cement-steel 5 centimetres thick, in which the network of steel is disposed in meshes of dimensions graduated in proportion with the resistance required at each point. Each panel of reinforcement is connected to those adjoining by hooking and binding together the separate wires and bars of the metal so that the entire surface of each floor really consists of a single monolithic slab of cement, the reinforcement of which is one connected system, formed of several smaller panels woven together. To employ a homely illustration, it is somewhat like the patchwork quilt which was formerly to be found in every well-regulated home.

The floor-panels are laid upon concrete-steel stiffening ribs 20 centimetres deep by 5

centimetres wide, arranged in accordance with the systems of triangulation, of which one example is represented by the broken lines in Fig. 88. The arrangement of the triangulation varies from floor to floor, and is in every case designed to suit the precise conditions of loading. The stiffening ribs are termed by the originator of the system *épines-contreforts*, or counterfort-spines, with the object of indicating that they are not to be regarded as independent beams or joists, but rather as members analogous to the ribs and backbone that reinforce the body of a vertebrate animal. In the case of the building now under consideration all such members were made beforehand in an extemporised workshop in the basement, with the threefold object of ensuring satisfactory execution, of obviating the necessity for the costly system of beam moulds and struts usually employed in the construction of concrete-steel floors, and of avoiding enforced stoppages of work during the hardening of concrete in the beams and joists.

Concrete members formed in moulds on the floor of a building are certainly not moulded under the most satisfactory conditions. The concrete is deposited by unskilled workmen, and, as the moulds are rapidly filled, it is more than probable that the material is never properly tamped as layer after layer is deposited. Hence there is considerable risk of voids and faults which cannot be rectified when once the work has been finished.

In the case of the *maison de rapport* in the Avenue Rapp, the ribs were moulded flat, as sketched in Fig. 91. Here the dimension 20 centimetres represents the depth of the rib, but, as the member is moulded on its side, the depth has no influence on the quality of the work, and the concrete can be thoroughly tamped in accordance with the requirements of good practice. The rib illustrated in Fig. 91 may be taken as typical of those used throughout the building now under discussion. The reinforcement includes two bars of steel, one at A and the other at B, longitudinal wires (a) and transverse wires (b), each of the latter being tied to the bars A and B, and forming a loop (c) projecting through the top surface of the rib. The area of steel in the bars A and B depends upon the duty of the rib. The wires (a) are in spiral coils of flattened form, and the wires (b) are straight, the diameter in each instance being 4.4 millimetres. The projecting loop (c) is for the purpose of incorporation in the floor slab, and forms part of its reinforcement. Of course Fig. 91 is merely a section at one point in the length of the rib, and it must be remembered that transverse wires as (b) occur at frequent intervals, forming with the longitudinal (a) a complete network in the concrete, and helping to bind the whole floor construction together.

After the ribs of this general type had been moulded in the workshop and had hardened sufficiently they were turned out from the

moulds and stored on the basement floor in an upright position. A large quantity of these members was moulded during the building of the masonry walls of the basement, and, being stored in the manner stated, they occupied comparatively little floor space. Being finished well in advance of the time when they were wanted for use, the concrete had thoroughly hardened, so that the ribs could be handled without injury and hoisted to the required elevation by means of tackle, just as if they had been of steel or timber.

To show how small is the risk of damage to concrete-steel members moulded in advance and thoroughly hardened, we may mention that, when a rib of the kind described above and 7 metres long was being hoisted during the construction of the Lycée Victor-Hugo, the chain of the lifting tackle broke and the rib fell from the fifth story to the ground, where it arrived in a vertical position. Notwithstanding the tremendous shock and the great length of the rib, the latter was not damaged in any way, and, as soon as a new chain had been fitted to the hoist, it was raised to the desired point and built into the floor system.

It often happens, as may be seen by reference to the plan (Fig. 88), that two ribs cross each other. In such cases a "halving joint" is adopted somewhat similar to that used in carpentry. To make this joint, one rib (as N in Fig. 92) is first fixed in position and below it is placed another rib P made without the bar A. In Fig. 92 the rib P is shown in its final position.

Then a notch from the top down to the bar B is cut in the concrete of the second member at the point of junction. The wires (a) are also cut, and P is lifted so that N penetrates as far as the bar B.

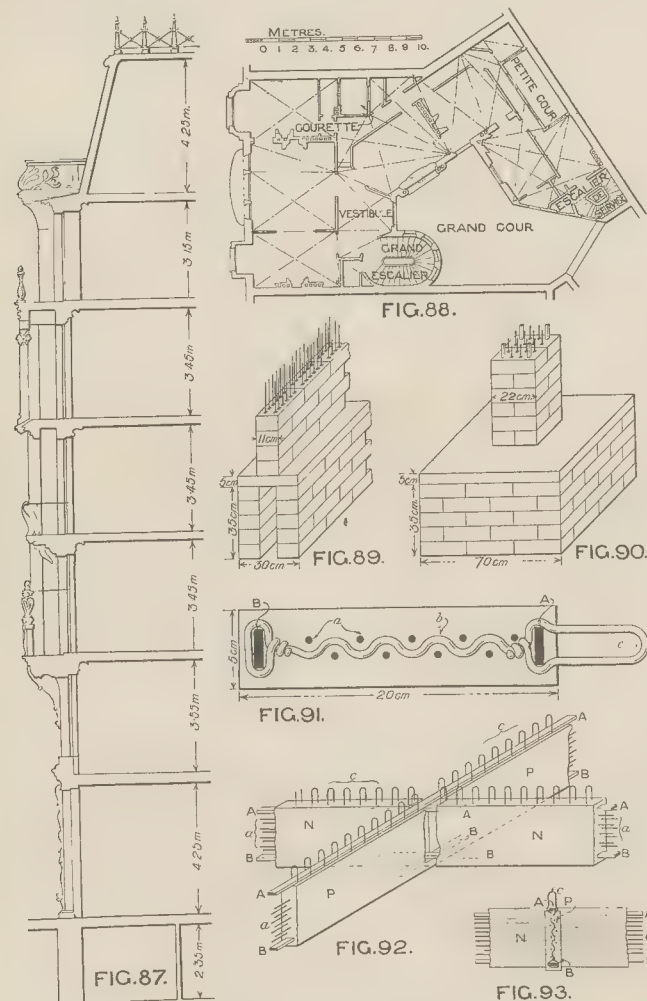
Then at the point of intersection the concrete of the rib N is cut away from A to B, and the bar B of one rib can be brought into contact with the bar B of the other as indicated by the dotted outlines at the middle of Fig. 92. Then the two bars are tied together. This is done by means of two spiral windings of 4.4-millimetre steel wire, the windings crossing each other at right angles.

The wires (a) of the rib N have not to be cut, and the ends of those in P which have been cut are joined together, thus restoring the arrangement which existed before they were disturbed.

Cement mortar is then applied to fill up the space of the concrete removed from the two ribs at the point of intersection, and the bar A, omitted from the rib P, is passed through the loops (c) of that rib. At the point of junction the bars A of the ribs N and P are securely wired together to make a firm connection. This joint is also covered with the mortar through which project the loops (c). In Fig. 92 the loops at the point of intersection of the two ribs are omitted for the sake of clearness. As the bars A and B of the two ribs are not halved together, it is clear that their top surfaces cannot be brought to the same level, but this slight difference is made up by the thickness of bar A of the second rib, which rests upon the top surface of the concrete.

In this manner a joint is made at the junction of two members without impairing the strength of either, as inevitably occurs when a joint of the kind is made in steel construction. Fig. 92 represents N in elevation and P in section, and from this sketch the relative positions of the bars A and B can be readily understood.

When the mortar of the joint is well set the space between the stiffening ribs is spanned by plates of reinforced plaster 2 centimetres thick. These plates are supported by cross wood wedged or otherwise held in position against the sides of the ribs, and over the work is spread a network of steel rods. This network is made beforehand in a suitable workshop, and its meshes pass between the loops (c) projecting from the stiffening ribs (see Fig. 93). Next the loops are bent downwards so that they form one end to the other of each rib, so that they form a kind of chain which imprisons the network spread over the plates of plaster. In this way the reinforcement for the floor slab is formed, and the armoured plaster plates constitute the centring for this purpose the floor slab. The material for this purpose consists of 1 part of Portland cement and 3 parts of sand, the first layer being mixed very wet to enable it to pass freely beneath and between the steel wires and rods, while, to assist



Illustrations to Student's Column.

penetration of the mortar, the network is tied up by means of hooks. The second layer of mortar is mixed very dry in order that it may suck up the excess of water in the bed below. In this way a homogeneous floor slab 5 centimetres thick is formed over the whole surface to be covered.

In places where it is desired to lay wood flooring strips of timber are bedded down upon the first layer of mortar, and are held in position by nails driven into the sides of the strips so as to project head downwards at an angle of about 45 degrees. The heads of the nails catch in the meshes of the reinforcing network, and are securely held by the surrounding mortar. Floor boards can then be nailed down in the ordinary manner.

It should be added that some of the stiffening ribs are made with beaded projections along the lower part of each side, thus forming ledges, which are used in the first place for supporting the sheets by which the plaster plates are held in place during the construction of the floor slab. After the slab has set, the cleats are removed and the sheets of armoured plaster are lowered until they rest upon the projecting ledges of the stiffening ribs and there remain as the permanent ceiling. Thus, when the joints are plastered up, a hollow ceiling is formed, confining an air cushion, which minimises the transmission of sound and the condensation of heat.

By the foregoing description, it will be seen that the method of construction quite obviates the necessity for expensive moulds and floor covering; while, as the ribs, the reinforcing network, and the armoured plaster plates can all be made in advance, there is no reason for tedious and costly delays during the erection of the building.

In our next article some other features of the *maison de rapport* will be dealt with.

COURT OF COMMON COUNCIL.

The usual meeting of the Court of Common Council was held on Thursday last week at the Guildhall, E.C., the Lord Mayor presiding.

Duke's Head-passage.—The Improvements and Finance Committee submitted for adoption an arrangement for widening and converting Duke's Head-passage into a carriage-way between Ivy-lane and Paternoster-square. The cost was estimated at 1,825*l.*, which sum would include all interests. After some discussion the arrangement was adopted.

Widening of Fleet-street.—The same Committee recommended, and it was agreed, that an arrangement should be entered into for

acquiring the ground needed to widen the public way in front of No. 69, Fleet-street. The sum required for the leasehold and freehold was 2,220*l.*

Electricity Bills.—A letter was received from the London County Council relative to the Supply of Electricity Bills now before Parliament asking the Corporation to nominate two representatives to attend a conference of local authorities on the subject.

ADDITIONS TO GIRLS' HIGH SCHOOL, MANCHESTER.

THE Biological Laboratory, opened on March 3, at the High School for Girls, Manchester, is another addition to that already important building.

Since the school was erected, in 1881, additional chemical laboratory, lecture-room, and gymnasium were added in 1886, and the last addition, whilst not materially extending the building, has been so designed as to provide, on the first floor of the south-west wing, a cookery school, and, above it on the upper floor, a biological laboratory, with the necessary conservatory and hothouse.

In the cookery school, 20 ft. by 32 ft., in addition to a gas stove, a large range of the "Wharnccliffe" type has been erected, and in close proximity is a large glazed earthenware sink, with drainer, plate-racks, etc., shelving for cooking utensils, and a large kitchen dresser, comprising the necessary fittings for practical working. These are placed at that end of the room which has recently been erected, and has the walls up to the ceiling level faced with white glazed bricks. The remainder of the room, with its walls and ceilings of cream and white enamel, is given up to the benches and tables for the students.

Immediately below, on the ground floor of the building, is the school kitchen, etc., and a dinner lift has been arranged, giving communication between this and the new cookery school, also a telephone between the two departments is utilised to the greatest advantage, and any stores required for demonstration purposes are at once obtained from the school supply.

The biological laboratory has been formed by utilising an old lecture-room, nearly 40 ft. long by 25 ft., in the roof of which top light has been placed. From the plan it will be noticed that benches against the side walls give accommodation for seventeen students, whilst, in the centre of the room, on a table bench, is provision for a further twelve. Under the latter bench are arranged drawers and cupboards for specimens, students' instruments, etc., and at the end is a large glazed earthenware sink, with two pairs of taper taps, supplying hot and cold water. A

second sink, having a drainer, is provided against the wall near to the lecturer's table. The tops of the benches are all of teak.

Under the side benches are heating pipes, and a space is left between the bench and the dado to allow of the heat rising into the room itself, but it is kept from the students' legs by a wooden curtain arranged in a series of flaps, which can be lifted for the purpose of cleaning or attending to the heating pipes. Each student is provided with a special chair and a foot-rest.

Gas, with separate connections for movable standards, etc., is provided for each student.

In the centre of the north-west end of the room is a large cupboard, the lower part of which is fitted partly for mounted diagrams, and partly as specimen shelves, whilst cupboards with glass doors form the upper portion, and in which are kept specimens in spirit.

Close to this fixture and in the corner of the room is built a slate slab for the purpose of growth experiments, which, although in the upper part of the building, is practically rigid.

The lecturer's table forms the chief fitting at the other end of this laboratory, and is of the usual type, fitted with cupboards, drawers, etc., and with a sink in the centre, with a glass front facing the students, which can be utilised or completely hidden from view as the lecturer desires.

From the platform on which this table stands, the lecturer controls the sliding blackboards, which are balanced so as to be easily raised or lowered, are made of glass, and of the most modern description. Corresponding with the blackboard, the opposite side of this platform, is a frame for diagrams, a portion being fixed, and the remainder being balanced for raising or lowering.

In arranging this laboratory, such matters as test-tube drainers, diagram stands, etc., have not been overlooked. Over the dado at one side is a rack in which can be exhibited specimens in frames of glass-topped boxes.

At the back of the lecturer's table is the entrance to the conservatory, out of which is entered the hothouse.

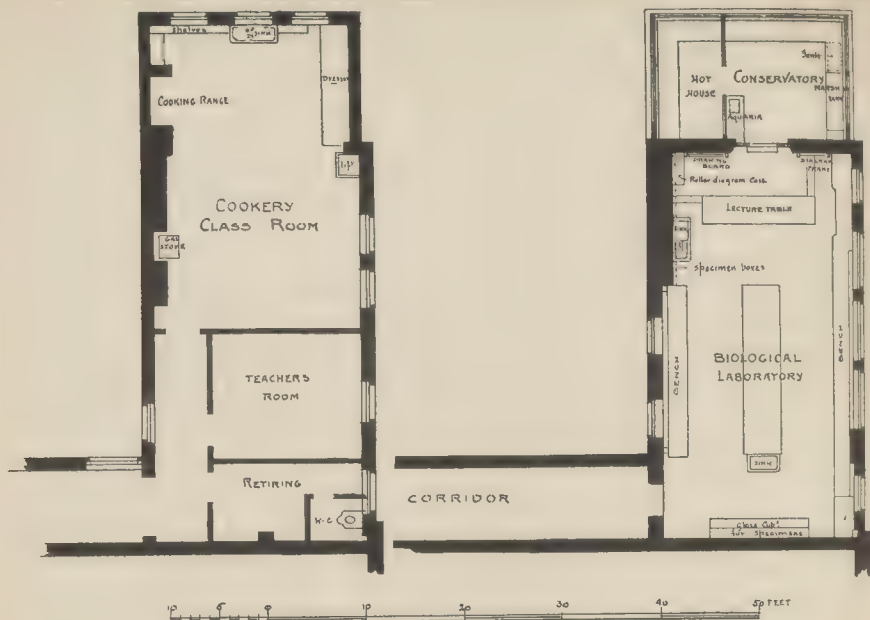
In the latter are various fittings, such as a water tank, shelving, with sink bed, covered with charcoal and coke, and heating pipes arranged to be used either separately or in conjunction with those in the conservatory.

In the conservatory, besides the staging, as in the hothouse, there is a plentiful supply of shelves, and there is a lake garden (the gift of the School Field Club), or a large tank in which can be grown water or marsh plants; this has a glass front, and is made of slate; it can be filled with rain water from the roof or from the town's water as desired.

On a long table, on the other side, stands



Biological Laboratory, Girls' High School, Manchester. Messrs. Mills & Murgatroyd, Architects.



Additions to Girls' High School, Manchester. Plans.

fresh-water and marine aquaria, which can be kept fresh by an aerative apparatus when necessary. The greenhouse is lofty, and here it is intended shall be carried out experiments on plants which can be under continuous observation.

The whole of the alterations and additions have been carried out from the plans and under the superintendence of Messrs. Mills & Murgatroyd, architects, of Manchester.

OBITUARY.

MR. PERTWEE.—The death, on March 19, is announced of Mr. Charles Pertwee, at his residence, Clarendon, Chelmsford, in his 73rd year. Mr. Pertwee, who was formerly Surveyor to the Borough of Chelmsford, was elected an Associate of the Royal Institute of British Architects in 1881. He was employed as architect in respect of a large number of schools, hospitals, churches, and chapels, chiefly in his own county. Amongst his works of that kind are included the following:—Congregational Chapel at Great Wakering; restoration of Great Baddow parish church, 1897; enlargement of the Congregational Church Schools, Dunmow; and of the Sunday Schools and the Congregational Church Schools at Brentwood; the Boys' and Girls' School, Moulsham; laboratory and workshop, King Edward VI's Grammar School, Chelmsford; Congregational Church, Baddow-road, Chelmsford; school-room and offices, Hall-street, Chelmsford; and the entire renovation of the Congregational Church and Sunday Schools, Kelvedon. He was architect of the Chelmsford Infirmary, 1896; and of a house, for Mr. A. Miller, at Rainsford End. He acted as joint architect with Mr. Frank Whitmore (in 1900) for the alteration and enlargement of the London and County Bank, Chelmsford. During the past five or six years he and his partner, practising as Messrs. Charles & W. H. Pertwee, of London and Chelmsford, were the architects for the additions to and the alteration of Nos. 67, 69, and 71, Southampton-row, London, W.C.; the Congregational Chapel, West Roding; the Isolation Hospital, near Sutton Ford Bridge, Rochford, for the Rochford Rural District Council; new premises for the Chelmsford Star Co-operative and Industrial Society; the church manse, Tiptree Heath; an enlargement of Prince's Skating Club, Knightbridge; the Isolation Hospital, with administrative block, offices, etc., in Deadman's-lane, Great Dunmow, for the Dunmow District Council; and, in May, 1900, they were awarded the third premium for their designs, out of thirty submitted in the competition, for the police headquarters at Chelmsford.

MR. ARDING.—Mr. John Bennett Arding, of No. 22, Surrey-street, Strand, died at his residence,

Newark House, Palace-road, Streatham Hill, on Friday, March 10, aged 76 years. He was senior member of the firm of Messrs. Arding, Bond, & Buzzard, architects and surveyors which was dissolved in June last year. Mr. Arding was elected an Associate of the Royal Institute of British Architects in 1887; he became a member of the Architectural Association in 1848, and was a Fellow during thirty-five years past of the Surveyors' Institution. He was clerk and surveyor to the Bowyers' Company for many years, and was lately rector-warden of that Company. Messrs. Arding, Bond, & Buzzard were the architects, in 1885-7, for the entire internal reconstruction of No. 429, Strand, for the British Medical Association.

MR. A. T. WALKER.—We have to record the death, in his 70th year, of Mr. A. T. Walker, A.M.Inst.C.E., Mr. Walker, who was a native of Aberdeen, was formerly in the service of the Cambridge University and Town Waterworks Company; and thence, in 1875, went to Reading as sub-manager of the Waterworks Company there, and was appointed their manager in 1883. In that capacity he carried out the high-level service reservoir at Tilehurst, and other important works connected with the water-supply of the district.

MR. ELLIS H. PRITCHETT.—The Hon. Secretary of the British Fire Prevention Committee sends us some particulars as to the death of Mr. Ellis H. Pritchett, of Swindon, who was a Fellow of the Institute of Architects and of the Surveyors' Institution, and appears to have given special attention to the subject of fire prevention, since he was chief officer of the Swindon Fire Brigade, a member of the executive of the British Fire Prevention Committee, and a member of their special commission which visited the principal cities of Central Europe last year. The funeral, which took place at Swindon on Wednesday, was conducted on fire service lines, the brigades of the West Midland district of the National Fire Brigades' Union parading in full uniform under the district chairman, Mr. C. O. Gardner, of Stroud. The British Fire Prevention Committee was represented by its Chairman and Hon. Secretary, and several members, as was also the International Fire Service Council.

YEOMANRY HEADQUARTERS, HULL.—The new headquarters of the Hull squadron of the East Riding of Yorkshire Imperial Yeomanry, and a club for the whole regiment, were opened on the 11th inst. The buildings comprise a riding school and officers', non-commissioned officers', and troopers' messes. The contractor for the work was Mr. T. J. Windlass, and Messrs. Thompson & Kirton were the architects.

GENERAL BUILDING NEWS.

WESLEYAN CHURCH, SALTLEY.—The new Wesleyan Methodist Church, which has been erected at a cost of 4,000l. on a site in the Alum Rock-road, Saltley, was opened on the 15th inst. by the Lord Mayor. The building provides sittings for 500 adults on the floor and 400 in the galleries. Underneath the choir gallery is a vestry, and space has also been reserved for four classrooms. The choir in which the organ is placed is 28 ft. by 20 ft. and opens to the church by a wide arch, while on the floor in front is placed the rostrum. Two rows of stone-coloured terra-cotta columns and arches carry an open-timbered lofty roof, while the columns at the same time support the galleries. The church is built of red bricks, with stone-coloured terra-cotta dressings. The work has been carried out by Mr. W. Bishop, of King's Heath, from the designs of Mr. Arthur Harrison, architect, Birmingham.

CHURCH, DEVONPORT. The foundation stone has just been laid of the new church attached to the Devonport Royal Naval Barracks. The church will consist of a nave 40 ft. wide, with narrow aisles to serve only as passages, chancel, side chapel, baptistry, vestries, organ chamber, and will provide seating accommodation for 1,000 officers and men, all on the ground floor. In the design advantage has been taken of the slope of the ground to obtain a large covered vestry under the chancel; this will serve as a room for meetings. The materials will be local limestone for the walls, with Portland stone dressings outside and Monk's Park stone inside. There will be an open timber roof as the nave, and a barrel roof with ribs to the chancel, these roofs being covered with green Westmorland slates. The aisles, chapel, and baptistry will be roofed with concrete. The design, which has been prepared in the office of the Admiralty, is of a simple character, with arches throughout and tracery in the large window. The work is being executed by Mr. A. Carkeek, contractor, under the supervision of Mr. W. J. Clarke, M.Inst.C.E., Superintending Civil Engineer of Devonport Dockyard.

SYNAGOGUE, NEW CROSS.—The synagogue, which has been erected on the Fairlawn in New Cross-road, was recently consecrated. The building, erected from drawings by Mr. Delissa Joseph, is of Romanesque style, built in red brick, and provides accommodation for 200 gentlemen on the ground floor, and ladies in the gallery. At the rear are classrooms for the religious instruction of Jewish children and congregational meetings.

NAVY TRAINING COLLEGE, EAST HAM.—The Prince of Wales Training College, which was opened, on Saturday last, at the new Technical College at East Ham, is a fine building of red brick, with stone dressings.

Technical Institute and Secondary School is of red brick, with terra-cotta dressings and carved reliefs. Situated just off the main street in a wide thoroughfare, it stands close to the recently erected municipal buildings, with which it harmonises in style. The cost has been £2,000.

There are entrances on both the north and west sides, the latter, which faces the municipal buildings, leading into a hall having a double staircase of Carrara ware leading to the upper floor. The walls of the two halls and the corridors throughout are faced with glazed white tiles, with a dado of green tiles surmounted by a heavy moulding of polished wood, while the floors are terrazzo and concrete. All the rooms are floored with polished oak. The assembly-room, in the centre of the north side, is lit from the roof with stained glass, and is panelled, the tympanum of the room being carved. Eight classrooms occupy the remainder of the principal floor, all fitted out with desks and chairs. On the upper floor are the rooms devoted to the arts and sciences. Here are a botanical-room, chemical classroom, and laboratories, and modelling and art-rooms completely furnished with casts. On the ground floor provision is made for the pursuit of various crafts—plumbing, carpenter, brickwork, etc., together with a carpenter's shop and physics laboratory. The architects are Messrs. Cheers & Smith, of Tringham.

EXTENSION OF THE ART GALLERY, MANCHESTER.

A meeting of the special committee for the extension of the Manchester Art Gallery was held on the 16th inst. in the Gallery, Mosley-street. A scheme for carrying out a temporary extension of the gallery till the new site now occupied by the Royal Infirmary, is ready for use has been prepared at a cost of about £5,000. In view of existing circumstances this amount was considered to be too large, and the special committee were requested to prepare a scheme of extension of a less costly character. Mr. Price, the City Architect, was present at the meeting.

GOVERNMENT BUILDINGS, WHALE ISLAND.

The Admiralty have sanctioned an estimated outlay of about £50,000, for an enlargement of the officers' quarters at Whale Island so as to provide for the accommodation of sub-lieutenants who, for their course of gunnery instruction on the island, are at present quartered in the college and dockyard at Portsmouth. The contract is taken by Messrs. Patman & Fotheringham, who will extend the existing block some 12 ft. westwards, and the kitchen northwards as far as the stables, to accommodate a number of eighty officers. The messroom will be enlarged to nearly twice its size; the billiard-room is to be absorbed into the smoking-room, and two new billiard-rooms will be provided; the cardroom is to be added to the hall; corresponding additions will be made to the servants' quarters; and the kitchen and office cellars, etc., belonging to the officers' quarters will be set back on the north side and divided from the men's block by a passage about 15 ft. wide.

PAVILION AND RECREATION PARK, DUNOON.

The laying of the foundation-stone of the new pavilion in connexion with the Castle Gardens, Dunoon, and the cutting of the first sod of the recreation park, took place on the 21st inst. The work is being carried out from designs by Mr. Fraser, architect.

WAREHOUSE, GLASGOW.—A new warehouse has been erected at the corner of Nelson-street and Tungaie, Glasgow, and immediately adjoining the "Old Tontine." The entire building is from plans by Messrs. Thomson & Sandilands, L.A., Glasgow.

THEATRE, ABERDEEN.—Operations have now commenced for the erection of the new theatre in Aberdeen upon the site immediately east of the United Free South Church. The ground faced by the Theatre Company has a frontage of 127 ft. in Rosemount-viaduct, but 10 ft. of this frontage nearest the church must remain unbuild upon. The feu extends northwards a distance of 139 ft., and reaches the proposed site of Skene-street. The plans of the new building have been prepared by Messrs. Frank Mathison & Co., architects, London. The lower or basement floor is 23 ft. below the level of the Viaduct, and will be occupied by electric light and steam heating plant, and the surplus area as a property-room. Above the basement is the pit floor, which contains three different sections of seating accommodation—viz., the orchestra stalls, pit stalls, and pit. Adjoining the pit on the east side is a refreshment saloon. The north end of this floor is occupied by the orchestra and stage, with a private box on either side. The floor above the pit floor on a level with the Viaduct, and contains all the main entrances. The vestibule is about 35 ft. by 20 ft., and from it access is obtained to the dress circle and orchestra stalls. The two floors above the level of Rosemount-viaduct are occupied, the first

as the upper circle, and the second as the gallery. From the vestibule there is also direct access to the lounge, refreshment saloon, and ladies' retiring-rooms, etc. Seating accommodation will be provided for about 2,350 persons. The dressing-rooms and other offices and appointments are situated along two sides of the stage. The auditorium is separated from the latter by a fireproof curtain. The front exterior is to be wholly built of white Kenney granite, and the other elevations of Tillyfourie stone. The contractor for the mason work is Mr. Alex. Anderson, Aberdeen. The estimated cost of the structure when completed is £55,000.

THE TOWER BRIDGE POLICE COURT.—The Tower Bridge Police Court, which is to take the place of the existing Southwark Police Court, has just been completed. Excluding the site, for which £9,000 was paid, the cost of the building, together with the adjoining police station, which was opened last autumn, has been £45,000. It has been erected from designs by the Police Surveyor (Mr. J. Dixon Butler). The exterior of the court is of Portland stone and red brick, with granite base. A circular porch with Corinthian pillars, surmounted by the Royal Arms, forms the main entrance. There is a large entrance hall, and on the ground floor is the principal court-room. On the first floor there is another court-room, thus permitting the civil cases and the criminal cases to be dealt with separately. Accommodation is provided for witnesses and other persons having business at the court. There are thirty cells for prisoners under remand, and also waiting-rooms for both male and female prisoners. The whole block of buildings, which was begun two years ago, stands on a thick raft of concrete, it being found practically impossible otherwise to obtain a stable foundation.

NEW FACTORY, BROMLEY, E.—The removal of the billiard-table works of Messrs. Burroughes & Watts from Westminster to Bromley-by-Bow has now been completed. The work-shops, offices, and caretaker's apartments at Bromley cover a site of about 1 acre. Messrs. Francis Morton, jun., supplied the steelwork, and Messrs. Joseph Cliffe & Sons the Lethaby green glazed bricks for the fireplaces. The joinery and carpentry was all done on the premises. Mr. Sidney B. Caulfield is the architect.

REBUILDING IN BLOOMSBURY.—A large block of buildings, to be occupied as offices, has lately been erected by Messrs. Prestige & Co., contractors, at the corner, west, of Southampton-street and High Holborn. The plans and designs were prepared by Mr. H. P. Adams, who also made sketches for the carving executed by Mr. Aumonier.

STAINED GLASS AND DECORATION.

ST. SAVIOUR'S COLLEGIATE CHURCH, SOUTH-WICK.—Considerable progress has been made with alterations in St. Saviour's Collegiate Church, Southwark. Mr. Choate, the American Ambassador, who is a Harvard man, having expressed a wish to appropriate and fill with painted glass a large window in the chapel of St. John the Divine as a memorial to John Harvard, the iron framework of the window has been removed and stone tracery substituted at his Excellency's expense. The stained glass for the purpose is being made in America under the direction of Mr. Charles F. W. Kim, the American architect, who was educated at Harvard. Meanwhile, Mr. Phillips, of the American Embassy, has issued an appeal to past and present Harvard men for funds wherewith to convert the vestry of the church into a chapel as a further memorial to the founder of the great University in America, who was born in Southwark and baptised in St. Saviour's Church on November 29, 1607.—Times.

FOREIGN.

FRANCE.—The Académie des Beaux-Arts has suppressed the system of giving subjects for competition to the students of the French school at Rome. Henceforth they will be at liberty to choose their own subjects for their *envois*.—The Académie has awarded the *Auville* three prizes (academic) to M. Julien Puthod. The Government, under the advice of the Under-Secretary of State for Fine Arts, has decided to suspend from his functions M. Thomas, the architect in charge of the Grand Palais des Beaux-Arts. He was one of the three original architects of the building, and has neglected for years to furnish particulars which have long been demanded.—M. Redon, the architect to the Louvre, has established a new lift there to the second story, which will facilitate the access to various galleries that cannot at present be very easily reached by the public.—On the recommendation of the Under-

Secretary of State for Fine Arts, the Hôtel de Rohan, in which the Government printing works are at present established, and of which the demolition had been announced, is to be preserved and classed among Monuments Historiques.—The works carried on in the progress of the Metropolitan railway line No. 5 have led to the uncovering of the old foundations of the Bastille, and the piers which formerly carried the drawbridge.—

In the early days of May an exhibition is to be opened at the Musée Galliera of wrought iron-work and work in copper and pewter. The exhibition is organised by the Service des Beaux-Arts of the Paris Municipality.—The Municipal Council of Paris is proposing to purchase all the works and sketches left by Delou, with the object of adding them to the exhibition at the Petit Palais.—The jury of the competition for the laying out of a new park at Nancy has awarded the first premium to the joint design of M. Vacherot, landscape architect, of Paris, and M. Contal, of the same profession, of Lille.—Parliament is to occupy itself shortly with the question of the rebuilding of the Luxembourg on its present site, to which is to be joined a portion of the garden belonging to the "Petit Luxembourg."—There is talk of rebuilding the Mairie of the XVIIth arrondissement (Batignolles) on its present site.—The Municipal Council of Moulins have commissioned M. Baer, the architect, to carry out a museum there, utilising the pavilion of Anne de Beaune. The cost is estimated at £17,000 francs.

MISCELLANEOUS.

WHITWORTH AND CITY ART GALLERIES, MANCHESTER.—By the testamentary dispositions of the late Mrs. Mary Worthington, of Sale, Chester, and Vice-President of the Union of Manchester University Women Students, a collection of water-colour and other drawings by Turner, Copley Fielding, Samuel Proust, Mulready, MacIise, and others is acquired by the Whitworth Gallery, and the pictures of a "Landscape with Cows," by Turner, and "Ghent," by Calcott, are bequeathed to the Corporation for deposit in the City Art Gallery. The former request comprises Proust's "Tournai," and "Witnburg" (two views); Mulready's drawing of his birthplace in Kensington; MacIise's pencil drawings of the Norman Conquest; Fielding's "Old Newby Bridge"; and Turner's "Fonthill," "The Thames at Eton," "St. Mary's, Malvern," "Llanberis Lake," "Norham Castle," "Easby Abbey, Yorkshire," and three views of Cassiobury Park, Hertfordshire.

CHURCH BUILDING SOCIETY.—The Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels held its usual monthly meeting on the 16th inst. at the Society's House, 7, Dean-street, Westminster Abbey, S.W. The Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz.:—Building new churches at Brondesbury, St. Laurence, Middlesex, 150l. for the first portion; Cwmllynfell, St. Margaret, Carmarthenshire, 100l., in lieu of a former grant of 75l.; and Salmey Ferry, near Chester, 80l. for the first portion; and towards enlarging or otherwise improving the accommodation in the churches at Barton Mills, St. Mary, near Mildenhall, Suffolk, 30l.; Llantwit Major, St. Illtyd, near Cardiff, 50l.; and Prestatyn, Christ Church, Flint, 55l. A grant was also made from the Special Mission Buildings Fund towards building a mission church at Abertillery, St. John, 25l. The following grants were also paid for works completed:—Prestwich, St. Hilda, near Manchester, 75l.; East Bridgford, Hants, St. Peter, near Nottingham, 25l.; Eastleigh, Church of the Resurrection, Hants, 50l., making in all 250l.; Wandsworth, St. Mary the Virgin, Surrey, 150l.; and Woodstone, St. Augustine, near Peterborough, 20l. In addition to this, the sum of 220l. was paid towards the repairs of seventeen churches from trust funds held by the Society. The Annual General Court of the Society will be held on Thursday, May 4, at the Church House, Dean-street, Westminster, at 3 p.m., when the chair will be taken by the Lord Bishop of St. Albans.

AUSTRIAN MARBLE, CEMENT, AND ASPHALT.—Mr. H. L. Churchhill, the British Consul, in his report on the trade and commerce of Trieste for the year 1904, mentions that the Trieste Marble Company, whose work really began some eighteen months ago, has now been legally formed. The quarry is situated on Monte Planik, in Istria, and produces a very solid and beautiful marble. One section of the quarry contains a white marble with a dim pink shade, whilst another section supplies an almost white marble with light pinkish

and yellow veins. The quality of the marble is not yet widely known, but where samples have been sent it has created quite a sensation, and trial orders have been promptly forthcoming. Blocks of almost any size can be supplied. Samples will be sent on application. Rough blocks have only been supplied thus far, but machinery is being ordered so that, in 1905, orders for polished work can be executed. At the Momiano, Istria (three hours by rail from Trieste) a beautiful marble quarry has been discovered. The quarry has never been worked, and is for sale. Another marble quarry, discovered lately at Momiano, is working. The Austrian cement export is of no great importance. The factories are too far from the sea, so that they cannot always successfully compete with foreign countries. On the other hand, new manufactures are continually springing up in other countries, thus causing an over-production. Still the cement manufactures of the Alpine regions of Austria will have sufficient work for three or four years, as they are supplying the necessary cement for the construction of the Tauri railway (to be ready towards the end of 1907). A large cement factory has been erected at Lengerfeld (North Carniola), in the Trieste consular district. The yearly production is about 3,000 railway truck loads. A large establishment is to be erected near Albons (Istria) for the manufacture of Portland cement entirely for exportation. There are in the neighbourhood immense quantities of stone suitable for the manufacture of cement, and also a coal mine (Carpano-Vince), all situated close to the port of Rabaz. A manufacture of asphalt products has also been lately established.

EXCAVATIONS, CANTERBURY.—The excavations in the Abbey Field behind St. Augustine's College, Canterbury, are to be continued, in spite of the loss involved to this interesting work in the recent death of Canon Routledge. The field, which comprises some 3 acres, includes part of the site of the old Benedictine monastery founded in 598 by King Ethelbert and St. Augustine. It was put up for sale in 1900, and by the efforts of the late Primate, Lord Stanhope, Lord Northbourne, and others, was secured for the Church of England and vested in trustees. The buildings which stood upon it included the Abbey Church, the chapter house, dormitory, infirmary, hall, and chapel, and the early Saxon chapel of St. Pancras, while the church contained several shrines. The sum collected for the purchase by Canon Routledge in 1901 for the excavation work, and the trustees raised a further sum of 1,037. With these monies the precincts, which were used as a farmyard, have been gradually dealt with. The crypt of the Abbey Church, with its three circular side chapels, each containing a stone altar, has been cleared, and the work has been extended to the infirmary and other buildings. The funds are now exhausted, and contributions may be sent to the Rev. R. J. E. Bogie, St. Augustine's College, Canterbury.—*Times*.

THE CHEAP COTTAGES EXHIBITION.—The committee of the Exhibition of Cheap Cottages, to be held at Letchworth, Hertfordshire, in July, announce that prizes to the amount of 100l. will be given in each class of the building competitions—i.e., for detached cottages, pairs, and groups, built at a cost not exceeding fixed sums. There will also be a special prize of 100l. for the best all-round and cheapest cottage suitable for an agricultural labourer, and probably a further substantial prize for the best concrete cottage. The committee will consider plans for cottages to be built at the Exhibition up to April 15. Donations towards the prizes fund will be welcomed, in order to enable the committee to render the prizes more numerous and substantial. All donations, and any inquiries, should be addressed to the London office of the Exhibition, 347, Birkbeck Bank-chambers, Holborn, W.C.

Legal.

NEWCASTLE ANCIENT LIGHT DISPUTE.

The case of Cowper and Steel, Coulson, & Co., Ltd., v. Milburn and others came before the Court of Appeal, composed of the Lord Chief Justice and Lords Justices Vaughan Williams and Stirling, on the 20th and 21st inst., on the plaintiffs' appeal from the judgment of Mr. Justice Buckley, in the Chancery Division. (The case was reported in the *Builder* of June 18, 1904.)

In this case the plaintiff, Cowper, the freeholder, and the defendant, Milburn, the lessee of Dean Lane, brought the action against the defendants for an injunction to restrain them, their servants, and agents, from continuing

the erection of certain buildings so as to cause a nuisance or obstruction to the plaintiffs' ancient lights, as the same were enjoyed previous to the removal of the buildings formerly standing on the site of the defendants' premises. Until recently, on the west side of Dean-street, there were certain buildings of moderate height, and they had been acquired by the defendants and pulled down, and on the site the defendants had erected buildings far exceeding the height of the old buildings. The defence was a denial of liability, and, in the result, Mr. Justice Buckley held that there had been no nuisance on the part of the defendants, and dismissed the action, with costs. Hence the present appeal of the plaintiffs.

Mr. Ralph Neville, K.C., Mr. Asbury, K.C., and Mr. Maughan appeared for the appellants, and Mr. Warrington, K.C., Mr. Buckmaster, K.C., and Mr. O'Leigh Clare for the respondents.

At the conclusion of the arguments of counsel, the Lord Chief Justice said the Court was of opinion that there must be a report made by someone. He did not think, as at present advised, that the right question had been considered by Mr. Justice Buckley, and it was necessary that a report should be made. He and his learned brothers would settle the form of the reference to the person who was appointed to make the report, and when it had been received, the Court would give judgment on the appeal. The report, the Court wanted was whether there had been an obstruction of the light, assuming the old windows in the plaintiffs' building were still there.

PATENTS OF THE WEEK.

APPLICATIONS FOR PATENTS.

4,116 of 1904.—E. CHAUDRON: *Electrically Controlled Lifts and Hoists.*

Operating the mechanism of electrically controlled lifts and hoists, electrical travelling cranes, transporters, elevators, conveyors, or runway hoists by a circuit-making device at each floor or point, and a series of same in the cage corresponding to the floors electrically connected to forked, cut-out, or direction switches at the intermediate floors or points, said switches being operated by an appliance on the lift cage, the balance weight, crab, or trolley, or other moving part or cage, so that first one of the probable paths or circuits of the current supplying the solenoid or its equivalent, actuating the controlling switch for one direction of the motion's rotation, is automatically cut out, and then the other path for the opposite direction as the cage passes the aforementioned cut-out switches, until the one corresponding to the floor or point where the cage is required to stop at (which is really the only "live" switch) is nearly reached, when, by reason of the shape of the forked cut-out switch lever, the current is actually off.

8,192 of 1904.—J. SHANKS: *Water Supply Taps or Valves.*

Water supply taps or valves, consisting of a valve closing with the pressure water, and an actuated spindle operating a cup leather working in a barrel in the body of the tap, and a spring between the cup leather and the end of the barrel.

8,939 of 1904.—J. G. HALL: *Catches for the Doors of Gates and the like.*

Catches for the doors of gates and the like, characterised by a circular ball, a segment of which projects through a perforation in a face plate, the ball being normally retained against the edge of the perforation by a cup formed in a spring arm which is secured to the inside of the face plate.

9,162 of 1904.—A. MEIKLEJOHN: *Sliding and Folding Doors, Partitions, or Gateways.*

Sliding and folding doors, partitions, and the like, consisting of a wheel device running on trunnions in a rail mounted in a slidable and swivelling piston or plunger, which is carried in a metal shoe, flush with the surface of the door, partition, or the like, in combination with an upper projecting piece fitted on top of door, partition, or the like, provided with a knob, which runs between the two guide rails in a runner beneath the ceiling.

9,531 of 1904.—P. BAINBRIDGE and J. METCALF: *Sanitary Appliances for Use in Connection with Closets.*

A sanitary appliance, consisting of a container and detachable paper seat covers, means for holding the latter in the container, and means for connecting the container to a pedestal or to an ordinary enclosed or square-seated closet.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

9,350 of 1904.—W. LAMAWAY: *Brick-cutting Apparatus.*

This invention relates to brick-cutting apparatus, and has for its object to provide a simple and efficient device for saving bricks to any required shape, either square, as for ordinary building purposes, or at an angle or bevel for special requirements. A device made in accordance with this invention comprises a box having two pairs of the sides thereof cut away a pair of slotted arms mounted on a spindle and means for holding said arms in position.

9,971 of 1904.—J. WILLIAMS: *An Air-tight Door.*

An air-tight door and door frame, having between the said door and its jamb a resilient pad or beading, against which the said door when shut can be tightly pressed by the action of a resilient fastening device, the fastening device comprising a lever handle adapted to move in a plane approximately parallel to the face of the door, and having its fulcrum or pivot subjected to the action of a spring that tends to keep said lever handle pressed towards the face of the door.

15,903 of 1904.—F. V. BLACK: *A Method of Pointing or Surface Finishing for Buildings, Bridges, and Walls in Brick or Stonework, New or Old and Dilapidated.*

In carrying out the method of this invention the joints are raked out, the surface is washed down, and the joints, cracks, and holes filled in with a material stained to colour required, composed of Portland cement and pure oxide of iron, or oil mast, Parian or Keene's cement, and levelled with face of brick or stonework. Then the whole is stained with suitable flat colours for imitating red, blue, or buff brickwork.

24,204 of 1904.—J. W. SEVERKRON: *Kitchen Ranges and the like.*

This invention relates to kitchen ranges and ranges in which access can easily be obtained to the flues so that they may be quickly and easily cleaned, while being rendered airtight and smoke-proof by the panels covering the same. The invention consists essentially in providing the back and top part of the grate or range with detachable panels covering the apertures to the flues, the said panels when removed exposing the flues, thereby simplifying cleaning and making the fixing much secure and easy.

9,195 of 1904.—H. BRUKET: *Construction of Fireproof Walls and Partitions of Buildings.*

Constructing a fireproof wall or partition, consisting in the use of a number of slabs formed with V-shaped tongues and grooves, connecting the adjacent edges of the slabs with liquid cement, and laying in the joints a bed of washed sand and cement, floating the slab into position, coating the top edge of the uppermost line of slabs and the corresponding parts of the ceiling and walls or woodwork with liquid cement, and filling the space between the slabs and the ceiling with a fixing material.

3,292 of 1904.—PATENT VICTORIA STONE PAVING COMPANY and F. W. LAWS: *Moulds for the Manufacture of Paving Slabs.*

This invention relates to moulds for the manufacture of paving slabs, and has for its object to facilitate the opening of the moulds, to the removal of the slabs, and the replacement of the parts. The mould has the ledges forming the sides of the mould, partially fixed to the bottom and partially movable, the movable sides being fixed together so that they can be moved in one piece. The said movable sides are secured to the fixed sides at opposite corners by means of thumb screws, which are passed through them and adapted to engage in or plates fitted tightly into the ends of fixed ledges, suitable notches being formed either in the fixed ledges or in the movable ledges so as to ensure the movable parts being applied in the proper position.

10,803 of 1904.—W. H. BARTON: *Flooring.*

A fireproof flooring, consisting of a centring, comprising a number of metal strips, bands, or wires, or the like, coiled or wrapped round the joists, and running between said joists in a plane parallel to the lower surface of the floor, and designed to support thin sheets of metal or other material.

TERMS OF SUBSCRIPTION.

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SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

March 3.—By LASHGROVE & FREEMAN (at Bocking).
Essex Survey—69 to 107 (odd), Albert-rd.,
 w.r. 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

March 4.—By LANDROBE & FREEMAN (at Epsombridge).
Chesham Estate—Church-st., "The Browns Cottages" (four), l. w.r. 44, 17s.

March 7.—By PERKINS & SONS (at Southampton).
Southampton Hill—No. 1, rents 311.15s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 2, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 3, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 4, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 5, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 6, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 7, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 8, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 9, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 10, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 11, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 12, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 13, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 14, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 15, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 16, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 17, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 18, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 19, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 20, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 21, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 22, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 23, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 24, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 25, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 26, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 27, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 28, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 29, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 30, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 31, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 32, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 33, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 34, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 35, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 36, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 37, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 38, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 39, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 40, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 41, rents 222.14s., reversion is 360 and 988 yrs.

March 8.—By ELLIOTT & SONS (at Brighton).
Brighton Hill—No. 42, rents 222.14s., reversion is 360 and 988 yrs.

By BEAK & DANMATT.
 Greenwich—30, Blackheath-rd. (s.), l. w.r. 50s., 1 to 4, Queen's-cottages, u.t. 34½ yrs, g.r. 14s., w.r. 72s.

Greenwich—20, Ashburnham-rd., u.t. 42 yrs, g.r. 41.4s., e.r. 25s.

Greenwich—20, Ashburnham-rd., u.t. 41 yrs, g.r. 41.4s., e.r. 25s.

By HOLLIDAY & STANGER.
 Streatham—21, Hopton-rd., u.t. 78 yrs, g.r. 8s., r. 70s.

Woodford—Spring-rd., "Sydney Villa," l. w.r. 65s.

By LAMBERT & CO.
 Holloway—Citizen-rd., "The Cottage," u.t. 87½ yrs, g.r. 71s., e.r. 36s.

27 and 29, Corinne-rd., u.t. 68 yrs, g.r. 101.10s., y.r. 80s.

By NEWBORN, EDWARDS, & SHEPARD.
 Kensington—101, Edith-rd., u.t. 70½ yrs, g.r. 2s., y.r. 70s.

49, Comeragh-rd., u.t. 71 yrs, g.r. 101s., y.r. 60s.

Notting Hill—73, Lansdowne-rd., l. w.r. 70s.

Ilmington—28, Gibson-rd., u.t. 82½ yrs, g.r. 91s., e.r. 48s.

Pimlico—80, Tachbrook-st., u.t. 22 yrs, g.r. 8s., e.r. 60s.

Walthamstow—59 to 78 (odd), Cavendish-rd., u.t. 78 yrs, g.r. 30s., w.r. 208s.

By STIMSON & SONS.
 Peckham—62 to 78 (even), Peckham-rd., area 42,500 sq. ft., y.r. 452s.

Hampstead-road—92 and 94, Stanhope-st., u.t. 10 yrs, g.r. 101s., y.r. 98s.

Clapham—327, Clapham-rd., l. e.r. 70s.

Peckham—Cheney-rd., l. g. rents 12s. 12s., reversion in 74 yrs.

Coppleston-rd., f.g. rents 12s. 12s., reversion in 75 yrs.

Tottenham Court-road—1, Fitzroy-st., u.t. 23½ yrs, g.r. 90s., y.r. 160s.

By H. J. BLISS & SONS.
 Dalston—5, Albion-ter., u.t. 34 yrs, g.r. 41s., y.r. 28s.

Hackney—6, Mariello-ter., u.t. 69 yrs, g.r. 51.10s., y.r. 321.10s.

41 and 43, Leabard-rd., u.t. 75½ yrs, g.r. 61.10s., y.r. 68s.

56 North-st., w.r. 282.12s.

Stoke Newington—17, Aden-gr., u.t. 65½ yrs, g.r. 61s., y.r. 30s.

By EDWIN BYRNE (at Baisersden).
 Pimlico—127, St. George's-rd., u.t. 23 yrs, g.r. 14s., y.r. 80s.

50, Bessborough-st., u.t. 28½ yrs, g.r. 101.10s., y.r. 65s.

10, Bessborough-mews, u.t. 38 yrs, g.r. nil, y.r. 34s.

Battersea—282 and 284, Queen's-rd., u.t. 69½ yrs, g.r. 21s., y.r. 10s.

23 and 25, Marjorie-gr., u.t. 88½ yrs, g.r. 151.10s., y.r. 82s.

Wandsworth—35 to 52, to 66 (even), The Gr., u.t. 89 yrs, g.r. 92s., y.r. 444s.

Tooting—25 to 31 (odd), Selincourt-rd., u.t. 93½ yrs, g.r. 122.12s., w.r. 88s.

By WYATT & SON (at Emsworth).
 Emsworth, Hampshire—2, Bishops-rd., l. p. 27s.

By STEPHENSON & ALEXANDER (at Cardiff).
 Cardiff, Glamorgan—Whitechurch-rd., f.g. rents 129s. 10s., reversion in 89 to 98 yrs. (in one lot).

March 17.—By ELLIOTT & SONS (at Brighton).
 St. John's Wood—Boundary-rd., l. g. rents 50s. 8s., u.t. 32½ yrs, g.r. nil.

Canonbury—Canonbury Pk. North, l.g.r. 55s. 14s., u.t. 31½ yrs, g.r. 41s.

By RIDER & SONS.
 Lambeth—6 and 7, Thorne-st., u.t. 27½ yrs, g.r. 17s., y.r. 841.10s.

46, Thorne-st., u.t. 27½ yrs, g.r. 61s., w.r. 44s.

Notting Hill—4, Silchester-st., u.t. 58½ yrs, g.r. 51.10s., w.r. 361.8s.

Willesden—2 and 4, Waldo-rd., l. w.r. 67s. 12s.

21 to 31 (odd), Letchford-gdns., l. w.r. 187½ s.

Contractions used on these lists: F.g. for freehold ground-rent; l.g. for leasehold ground-rent; l.g. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; a. for estimated rental; w.r. for weekly rental; q. for quarterly rental; y. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; a. for shops; ct. for court.

MEETINGS.

CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Refer to be done
Power Station at Llwynypia	Glanorgan Coal Co., Ltd.	A. O. Evans, Williams, & Evans, Architects, Pontypool.	Mar. 27
Schools, Clarksfield	Oldham Corporation	H. Chestham, Architect, Prudential-buildings, Union-st., Oldham ..	do.
Boilers, Economisers, Pumps, Tanks at Warehouse	Newcastle-on-Tyne Guardians ..	Newcombe & Newcombe, Architects, 89, Pilgrim-street, Newcastle ..	do.
Road Works, George-street, Farncombe	Guildford R.D.C.	J. Anstee, Engineer, Council Offices, Guildford	do.
Brick and Concrete Piers, Mill Stream, Rickford	do.	E. F. C. Clarke, Clerk to Governors	do.
Additions to House, Blundell's School, Tiverton	The Governors	H. D. Williams, Council Surveyor, Brynmawr	do.
Minister's House, etc., Mooltryan	Ogmore and Garw U.D.C.	do.	do.
Six Houses at Ryhill, Barnsley	do.	F. E. P. Edwards, City Arch., Whitaker-bldgs., Brewery-st., Bradford ..	do.
Two Small One-Story Shops, Broad-street	Bradford Corporation	E. F. White, Architect, 27, Bangor-street, Carnarvon	do.
Pipes (Bentham Water Supply Works)	Heron Independent Chapel Com. ..	E. W. Dyson, Architect, 14, Market-hill, Barnsley	do.
Alters. & Furniture, Town Clerk's Office, Town Hall	Deal Corporation	Borough Surveyor's Office, 23, Queen-street, Deal	do.
Road Works, Wellesley-road, Ilford	Settle R.D.C.	S. Menzies, Engineer, Stockport	do.
400 tons Guernsey Granite Spalls	Ilford U.D.C.	City Engineer's Office, Leeds	do.
A Livezey Washer	Brentford Guardians	H. Shaw, Engineer, Town Hall, Ilford	Mar. 5
Alterations, etc., Mill Premises, Grove Mills, Morley	Messrs. David Bradley, Ltd.	W. Stephens, Clerk, Union Offices, Isleworth	do.
Ten Houses, Langley Park, Co. Durham	West Ham Guardians	T. A. Buttery & S. B. Birds, Architects, Queen-street, Noddy ..	Mar. 29
Granite	Messrs. White & Lowes	F. E. Hilliary, Clerk's Office, Union Workhouse, Leytonstone, N.E. ..	do.
Steelwork for Two Outside Emergency Staircases, etc.	Leeds Guardians	G. T. Wilson, Arch., 25, Durham-road, Black Hill, Co. Durham ..	do.
Wrought-Iron Balconies, Grilles, Gates, and Railings	do.	J. H. Douglas, Clerk, Market Harborough	do.
Galvanised Clothes-Back Frames	do.	T. Winn & Sons, Architects, 92, Albion-street, Leeds	do.
Concrete Bed & Wood & Stone Paving, Beckett-st.	do.	do.	do.
Materials	Oxford Corporation	W. H. White, City Engineer, Oxford	do.
Rea Valley Flood Relief Scheme (Contract No. 3)	Birmingham Corporation	J. Price, City Engineer, Council House, Birmingham	do.
Disinfectants	Canook R.D.C.	T. F. Pickering, Inspector, Oakley-pl., Busbury-lk., Wolverhampt. ..	do.
Broken Granite	do.	H. M. Whitehead, District Surveyor, Penkridge, Staffs.	do.
Road Metalling	Aylesbury U.D.C.	W. H. Taylor, Surveyor, Town Hall, Aylesbury	do.
Building Materials	do.	do.	do.
Ironwork	do.	do.	do.
Tools, Stores, etc.	do.	do.	do.
Labour	do.	do.	do.
*Branch Library, Little-road	Fulham Borough Council	Council's Engineer, Town Hall, Fulham, S.W.	do.
300 yds. of 18-in. Cast-Iron Pipes	Stockport Gas and Electricity Com. ..	W. Engineer, Gas Offices, Blom-street, Salford ..	Mar. 10
Electrical Feeder Cables	Roxburgh District Board of Lunacy ..	A. J. H. Carter, Borough Electrical Engineer, Milgate, Stockport ..	do.
Furniture and Furnishings, Male Hospital, Malrose	Gateshead Corporation	House Steward at Asylum	do.
Cement Path Work	Newcastle-on-Tyne Corporation ..	W. Swinburne, Town Clerk, Gateshead	do.
Materials, Stores, etc.	Guildford Corporation	C. G. Mason, Borough Surveyor, Tuns Gate, Guildford	do.
Flints for Road Material	do.	do.	do.
Portland Cement	do.	A. L. Thomas, Engineer and Architect, Pontypool	do.
Two Shops and Dwellings, Margaret-st., Abercromby ..	Wortley R.D.C.	G. & G. H. Crowther, Engineers, 38, New-street, Huddersfield ..	do.
Scavenging	do.	do.	do.
New Road (350 yds. of Front-street), Huddersfield ..	Edinburgh Corporation	Mr. Kingwell, Mann Alah, South Brent	do.
New Road (300 yds. of Front-street), Huddersfield ..	United National Collieries, Ltd.	R. Morham, City Architect, Public Works Office, Edinburgh ..	do.
Farmhouse at Mann Alah, South Brent	Gravesend Corporation	Colliery Offices, Exchange-buildings, Cardiff	do.
Mortuary & Disinfectant Buildings, High School Yds.	Chatham Town Council	F. T. Grant, Borough Surveyor, Town Hall, Gravesend	do.
Offices at Risco Collieries, Cross Keys, Mon.	Brighton Corporation	C. Day, Borough Surveyor, Town Hall, Chatham	do.
Road Materials	do.	do.	do.
Road Materials	do.	F. J. C. May, Borough Engineer, Town Hall, Brighton	Mar. 22
Drain Pipes	do.	do.	do.
Carpenters and Joiners' Work	Halstead U.D.C.	Badenoch & Bruce, Archts., Emerson-chmrs., Blackett-st., New-T. ..	do.
Smiths' and Ironfounders' Work	Yorkshire Inebriates' Act Joint Com. ..	W. A. Nicholson, Surveyor, Halstead, Essex	do.
Painters and Glaziers' Work	Houghton-le-Spring U.D.C.	J. Vickers Edwards, Architect, County Hall, Wakefield	do.
Temperance Hall, Allendale Town	Salford Corporation	J. W. Holbrook, Surveyor to Council, Houghton-le-Spring	do.
Eight-brake Horse-power Oil Engine, etc.	do.	Borough Electrical Engineer, Frederick-road, Pendleton ..	do.
Two Sets Refractory Cells, Inebriates' Reform, Gattai ..	do.	H. Beswick, County Architect, Newgate-street, Chasler	do.
Sewage Tanks	Incorp. Ch. of Ireland, Cork Y.M.A. ..	W. C. Reid, Architect, Elgin	do.
Wiring New Council Schools, Liverpool-st., Leedsley ..	Mr. J. S. Kemington	W. H. Hill & Son, Architects, 23, South Hall, Cork	do.
Sanitary Blocks, Parkside Asylum, Macclesfield	Rugby R.D.C.	Harrison, Hall, & Moore, Architects, Lancaster	do.
Church, Elgin	Working District Gas Co.	Vestry Room, Cwmfelin, Wales	do.
Additions, etc., 52, South Hall, Cork	Leeds Corporation	T. W. Willard, Surveyor to Council, Rugby	do.
Detached Residence, Anyome, Grange-over-Sands	Ponkington R.D.C.	A. Valon, 140, Temple-chambers, London, E.C.	do.
Chapel, Cwmfelin Monarch, near Llanbelydydd	Rt. Hon. Viscount Falmouth	City Engineer's Office, Leeds	do.
Sewers, etc., Bilton	Croft R.D.C.	T. Robson, Clerk, Pocklington	do.
Excavating, etc., for Gasholder	Staffordshire C.C.	Farmhouse at Tregenna	do.
1,288 sq. yds. Tar-macad, Stanningley & Bramley Pks.	Swinton and Pendlebury U.D.C.	C. H. Leach, Clerk, Union Offices, Darlington	do.
Blue Stone and Slag	The Trustees	do.	do.
Wain House, Tregenna, Llanmorran	Lancashire and Yorkshire Ry. Co.	J. Moncur, County-buildings, Stafford	do.
Whinstone	Cumberland & Westmorland C.C.	H. Entwistle, Surveyor, Council Offices, Swinton, Manchester ..	do.
Leading Stones	Longtown R.D.C.	W. Boddoe Rees, Architect, 8, Duffries-place, Cardiff	do.
Road Materials, Cartage, and Tools	Governors of Christ's Hospital	Mr. Duffin, Stores Department, Osborne-street, Manchester ..	do.
Annual Contract	Ebbw Vale Education Committee ..	G. J. Bell, County Surveyor, The Courts, Carlisle	do.
New Hope English Baptist Chapel, Caern, Maesteg ..	do.	J. Murray, District Surveyor, Kirkcubright, Carlisle	do.
Stores	Felixstowe and Walton U.D.C.	F. L. Lightfoot, 23, Abington-street, Westminster, S.W.	do.
Two Stone Bridges across Glenconyne and Airo Beck ..	Wangford R.D.C.	H. Waters, Architect, Bessford	do.
Stone Bridge across Kirk Beck, Shopford	Goole U.D.C.	do.	do.
Sewer, etc., at Horley Court Lodge Farm	Melton Mowbray R.D.C.	H. Clegg, Surveyor, Town Hall, Felixstowe	do.
Alterations, etc., at Russian School, Beaufort	Douglas Water Committee	F. S. Rix, Clerk, Beccles	do.
Additions, etc., Brierly Hill Schools, Ebbw Vale	The Taft Building Club	E. H. Barber, Surveyor, Council Offices, Goole	do.
Materials	New Siloh Chapel Com., Landore ..	A. H. Marsh, Clerk, Melton Mowbray	do.
Swimming-baths, Pasture-road, Goole	Eccles Corporation	F. Thorpe, Manager, Reservoir Works, Douglas	do.
Broken Granite and Slag	Boston Corporation	W. Dowdell, Architect, Treborth, Penryn	do.
Plant, Baldwin Reservoir Works	Edmonton U.D.C.	Surveyor to Council, Town Hall, Mountain Ash	do.
Twelve Houses at Troedyrhiw	Frinton-on-Sea U.D.C.	J. Richards, Architect, 64, Myssad-road, Landore	do.
Three Benches of Retorts, Penrhyw-llyn, Gwawod ..	Brighton Borough Council	E. Parkes, Town Clerk, Town Hall, Eccles	do.
Low-pressure Hot-water Heating Apparatus	do.	G. E. Clarke, Borough Surveyor, Municipal-buildings, Boston ..	do.
Temporary School, Beech-street, Winton	Messrs. Treharne	E. Eedes Bachus, M.Inst.C.E., Town Hall, Lower Edmonton ..	do.
Boundary Wall and Sanitary Conveniences, Winton ..	Ebbw Vale Electricity Committee ..	E. M. Bates, Surveyor, Council Offices, Frinton-on-Sea	do.
Barn, East Fen Farm	King's Norton & Northfield U.D.C. ..	Borough Engineer, Town Hall, Brighton	do.
Making-up Bretenham-avenue, etc.	do.	W. J. Fenell, Architect, 2, Wellington-place, Belfast	do.
780 lineal ft. of 4-in. Pipe Sewer, Eton-road	Blackrock U.D.C.	Clerk to Burial Board, 27, Louthier-street, Carlisle	do.
*Supplying and Laying Tar Macadam	do.	T. D. Morgan, Architect, Victoria-chmrs., Penrith, Newcastle Valley ..	do.
Chancel, Vestry, etc., All Saints' University-st., Belfast ..	do.	W. J. Thomas, Town Surveyor, Ebbw Vale	do.
Dutch Barn, Carleton Cemetery	do.	F. B. Hughes, Electricity Department, Town Hall, Manchester ..	do.
Alterations, etc., Cwmdare Hotel, Wimpore	do.	T. E. Ware, Surveyor, Waterloo-road, Epom	do.
Caretaker's House, etc., Ebbw Vale	do.	A. W. Cross, Surveyor, 23, Valentin-road, King's Heath	do.
High and Low Tension Switchboards, Dickenson-st.	do.	Surveyor's Office, Town Hall, Blackrock, Co. Dublin	do.
Materials	do.	do.	do.
Public Library at King's Heath	do.	do.	do.
Supplies	do.	do.	do.
Cartage and other Work	do.	do.	do.

CONTRACTS.—Continued.

<i>Nature of Work or Materials.</i>	<i>By whom Advertised.</i>	<i>Forms of Tender, etc., supplied by</i>	<i>Tenders to be Delivered</i>
Bells Piles and Economisers, Pipes, etc.	Hammersmith Borough Council ..	G. Gilbert Bell, Boro. Electrical Engr., 85, Fulham Palace-rd., W.	April 5
Boards to Travellers' Rest Inn, Consett	Mr. T. Clayvills ..	At the Inn ..	do.
Woods and Materials ..	Sunderland Corporation ..	Borough Engineer, Town Hall, High-street, Sunderland ..	do.
Builder's No. 6 Mortuary Chapel ..	Radclyffe U.D.C. ..	W. L. Bothwell, Engineer, Council Offices, Radclyffe, Glasgow ..	do.
Materials ..	Prestwich U.D.C. ..	W. Nuttall, Surveyor, Chester Bank, Prestwich ..	do.
Repairs to Sewerage Works, de Winton Est., Llwynypia	Reigate Education Committee ..	N. S. Griffiths, Surveyor, Excelsior-buildings, Tonypandy ..	do.
Repairs of Schools, Rehill ..	Metropolitan Asylums Board ..	E. Leonard, 15, Railway-works, London Bridge, S.E. ..	do.
Repairs to Work at Hospital, Woolwich ..	do.	Office of the Board, Embankment, E.C. ..	do.
Repairs to Work at Hospital, Deptford ..	do.	do.	do.
Repairs New Areas, etc., to Subway, etc., Woolwich ..	do.	do.	do.
Repairs and Repairs for Pontoon, Heston, Cardiff ..	do.	do.	do.
Repairs Repairs, Cast-Iron Posts, at Asylum, Sutton ..	do.	do.	do.
Repairs to Gas Main Water Pipes & Service Reservoir ..	Arbroath Corporation ..	Crouch & Hogg, C.E., 53, Bothwell-street, Glasgow ..	April 6
Repairs to River ..	do.	do.	do.
Repairs to Bridge ..	Radclyffe U.D.C. ..	W. L. Rothwell, Engineer, Council Offices, Radclyffe, Lancs. ..	April 7
Repairs to Road ..	Convoys Woollen Co., Ltd. ..	Convoys Co., Donegal, Ireland ..	do.
Repairs to Road ..	Carmarthen R.D.C. ..	J. Saar, 7, Hall-street, Carmarthen ..	do.
Repairs to Road ..	Berks C.C. ..	J. Morris, County Surveyor, Broadway-buildings, Reading ..	do.
Repairs to Road ..	Liverpool U.D.C. ..	F. Lancaster, Engineer, Council Offices, Liverpool ..	do.
Repairs to Road ..	Bromley & Beckenham Jt. Hos. Bd. ..	J. Ladd, Architect, 93, Pemberton-road, Harringay, N. ..	do.
Repairs to Road ..	Harrogate Corporation ..	E. W. Dixon, Engineer, 1a, Cambridge-crescent, Harrogate ..	April 8
Repairs to Road ..	do.	do.	do.
Repairs to Road ..	do.	A. S. Williams, Architect, Llandilo ..	April 10
Repairs to Road ..	do.	do.	do.
Repairs to Road ..	Tonbridge R.D.C. ..	F. Harris, Engineer, Broadway, Southborough, Tunbridge Wells ..	do.
Repairs to Road ..	do.	do.	do.
Repairs to Road ..	Mr. J. Braird ..	W. J. Fennell, Architect, 2, Wellington-place, Belfast ..	do.
Repairs to Road ..	Lord Dunleith ..	do.	do.
Repairs to Road ..	Edinburgh and Leith Gas Commrs. ..	Chief Engineer, Gas Works, New-street, Edinburgh ..	do.
Repairs to Road ..	Essex Education Committee ..	C. J. Dawson, Architect, 11, Cranbrook-road, Ilford ..	April 11
Repairs to Road ..	Great Western Railway ..	Company's Engineer, Paddington Station, W. ..	do.
Repairs to Road ..	Halifax Finance Committee ..	J. Lord, Borough Engineer, Town Hall, Halifax ..	April 13
Repairs to Road ..	Boston Guardianship Committee ..	J. Rowell, Architect, Church-chambers, Boston, Lines ..	April 15
Repairs to Road ..	do.	do.	do.
Repairs to Road ..	Tenterden Corporation ..	W. L. C. Turner, Borough Surveyor, Town Hall, Tenterden ..	do.
Repairs to Road ..	N. Wales Counties Lunatic Asylum ..	M. Lockwood & Sons, Foregate-street, Chester ..	do.
Repairs to Road ..	East Sussex C.C. ..	H. Wood, County Surveyor, Lewes ..	April 17
Repairs to Road ..	Clyde Navigation Trustees ..	G. M. Baxter, Engineer, 16, Robertson-street, Glasgow ..	do.
Repairs to Road ..	Tottenham Education Committee ..	G. E. T. Lawrence, Architect, 25, Buckingham-street, W.C. ..	do.
Repairs to Road ..	Ashtedon-Mortice U.D.C. ..	H. Weston, Ralph & Weston, Architects, Bradford ..	April 18
Repairs to Road ..	Borough of Shorelditch ..	A. W. S. Cross, Architect, 53A, Maddox-street, W. ..	do.
Repairs to Road ..	do.	J. Judson & Hudson, Architects, Oakworth, near Keighley ..	No date.
Repairs to Road ..	do.	Belfast Bank, Arntin (C.M. Taggart, Man. Thornhill, Kandalstown) ..	do.
Repairs to Road ..	do.	Duncan & Reid, 102, Mary-street, Carrington, Cheshire ..	do.
Repairs to Road ..	do.	Colliery Office, near Kenig Hill ..	do.
Repairs to Road ..	do.	T. Winn & Sons, 92, Albion-street, Leeds ..	do.
Repairs to Road ..	do.	F. Ross, Thwaites, Eyre ..	do.
Repairs to Road ..	do.	J. Jackson, Architect, Brewery-buildings, Bradford ..	do.
Repairs to Road ..	do.	Ammonal Explosives, Ltd., Victoria-buildings, Docks, Carlisle ..	do.
Repairs to Road ..	do.	G. A. Birkenhead, Architect, Caedonian-chambers, Cardiff ..	do.
Repairs to Road ..	Cardiff Grain Co. ..	W. G. Tower, 124, High-street, Guildford ..	do.
Repairs to Road ..	The Proprietors ..	do.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
* <u>Book and Works</u>	Relgate Union	3 <i>l</i> . 3 <i>s</i> . per week	Mar. 31
* <u>Discharge</u>	Norfolk Education Committee	2 <i>l</i> . per week	April 13

Those marked with an (*) are advertised in this number.

Competitions. iv, xvi.

Contracts, iv, vi, viii, x.

Public Appointments, xvi.

TENDERS—Continued from page 335.

LONDON BOARD OF EDUCATION—Continued.

Hulton, Wenlock-road (Painting Interior).			
McCormick & Co.		H. Boueaud	£253 14
S. S.	£451 0	Vigor & Co.	395 0
W. H. Harris &		Stevens Bros., 1A,	
	400 0	Yonge-park,	
J. Stewart	390 10	Seven-	
J. Grover & Son	376 0	road*	328 0
Morgenthau, W. Capland-street Junior (Painting Interior and Extentors of Main and Special Schools).			
J. Pinfille.	£590	Thompson &	
	490	W. Beveridge	£398
H. Dimham & Sons	490	W. Johnson & Co.,	
P. Fawcett	418	14	370
T. Dudley & Co., Ltd.	410	W. Chappell	310
Hillway Bros.		F. T. Chisholm &	
(London), Ltd.	409	Kincaid Green*	288
Perkinson, W. Rockingham-street (Painting Interior and Extentors).			
T. G. G. &		E. Figgis	£399 0
J. Appleby & Sons	500	W. S. Sayer & Son	385 0
W. J. Good	516 0	W. Henry & Son	392 10
J. G. G. &	496 0	G. Brittain,	247
Appleby & Sons		Kennington-	
(London), Ltd.	447 0	road*	356 0
Walmoth, Surrey-square (Painting Interior).			
J. P. Ford	£445	M. Triggs	£310
J. Appleby & Sons	400	E. G. 11 Bros.,	
W. J. Williams	378 0	1	804 0
J. Appleby & Green-		G. Brittain,	247
wood	375 0	Kennington-rd.*	255 0
Watergate, Hanbury-street (Painting Interior).			
W. Bourne	£239 10	J. Haydon & Sons	£175 14
T. J. Golds-	225 0	A. J. Sheffeld	138 0
W. A. G. &		W. J. King-	
ton	185 0	ston, Thomas	127 10
A. and Bromley, Smead-road (Relaying Floors in Infants' Department).			
A. W. Deery	£240 0	Vigor & Co.	£131 10
Amey & Loe-		Barett & Power	117 0
gans		T. J. Robey, 194,	
H. Boueaud	140 0	St. John-st.	93
	140 0	Bow-road	

Southwark, W., Lant-street (Painting Interior and

Exterior).

Lathery Bros.	1876 00	H. Teney & Son	1819 10 00
A. W. Dorby	672 00	W. Sayre & Son,	
198	154	sons, Ltd.	472 00
W. Sons	536 36	road*	478 00
W. Horne	513 50	G. Brittain	458 00
J. Greenwood,			
Ltd.	512 00		

For Erecting a School on the Site of Torridon-road,
Leuiskam.

The accommodation is as follows: Senior mixed school, 382; junior mixed school, 354; infants' school, 198; 124; (4) Senior mixed school (one-story building)—Hall, 57 ft. 5 in. by 26 ft. 6 in. Classrooms, 48, 48, 48, 48, 40, 40, 40, 40, 30. (Drawing-rooms and science rooms will be provided in one of the other buildings.) Heating by low-pressure hot-water apparatus. (b) Junior mixed school (one-story building)—Hall, 47 ft. by 25 ft. Classrooms, 56, 56, 50, 48, 48, 48, 48. Heating by low-pressure hot-water apparatus. (c) Infants' school (one-story building)—Hall, 54 ft. by 26 ft. 6 in. Classrooms, 50, 50 (babies' room), 48, 48, 48, 48, 48. Heating by low-pressure hot-water apparatus and open fire. Area of site, 97,850 sq. ft. Grounds area (including school and junior boys'), 86 sq. ft. Senior and junior girls', 50 sq. ft.; infants', 44 sq. ft.

Clarke & Bracey,	224,139	J. & C. Bowyer	250,883
R. L. Holloway	22,607	Patman & Fother-	
Shaws & Edge,	22,607	ingham, Ltd.	20,738
C. Ward	21,730	W. Johnson & Co.	
Kilbey & Gayford	21,723	Ltd.	20,512
Lloyds Bros.,		Rirk & Randall	20,475
(London), Ltd.	21,638	Holliday & Green-	
W. H. Sons,		land	20,440
Ltd.	21,678	J. Mansel & Sons	20,248
F. H. F. Higgs	21,330	J. Appleby & Sons	20,120
Lathery Bros.,	21,310	J. Garrett & Son	19,971
198	21,320	198	19,710
J. Greenwood, Ltd.	21,253	Tressure & Son,	
E. Lawrence &		Cottingham-rd.,	
Sons	21,138	Upper Holo-	
W. Downs	20,960	way	19,493

The architect's estimates comparable with these

LONDON.—For the erection of a generating station

at South Kensington, for the Commissioners of H.M.
Works and Public Buildings:—

Worke and Public Buildings	10 Higgs & Hill,	
Pollard & Broad	29,100	5,794 0
C. Ford	8,873 0	
Baynard & Son	8,597 0	Warieg White
W. Willett	8,500 0	Building Co.,
W. J. W. & Co.,		Ltd.,
Co., Ltd.	8,386 0	J. T. J. Wise
Deau & Co.	8,370 0	W. Wallis
H. Lovatt, Ltd.	8,260 0	Holliday &
J. Allen & Sons	8,198 0	Greenwood,
W. Patinsson &		Spencer, Santo,
Sons	8,143 0	& Co., Ltd.,
J. E. Johnson &		Ford & Walton,
W. H. Llewellys &	8,050 0	W. J. Renshaw
& Co.	8,000 0	Hudson & Co.
J. Christie	7,991 10	Appleby & Sons
Kingler & Co.	7,987 0	Lea & Sons
J. J. Glem &		Luslie & Co., Ltd.
Co.	7,980 0	Buile & Co.
Martin, Wells,		B. E. Nightingale
W. J. W. & Co.	7,970 0	Shelbourne,
Vigor & Co.	7,897 0	Co.,
		Wisdom Bros.,
		7,000 0

LONDON.—For the construction of an underground
convenience at Shepherd's Bush Green, for the Ham-
mursmith Borough Council. Mr. Hugh Mair, Surveyor,
Town Hall, Broadway, W.

Mason & Co.	23,616 0	C. Gray	53,737 10
Donohoe & Co.		Chambers	
G. Wimpsey &	6,558-00	Bros.,	5,700 0
W. J. W. & Co.	6,990 0	W. J. Dickens	5,948 0
E. B. W. & Co.		Martin, Wells,	
Co., Ltd.	5,989 0	& Co., Ltd.	5,948 0
Gardner &		Spencer, Santo,	
Razell	5,962 47	& Co., Ltd.,	5,939 0
H. J. W. & Co.	5,968 0	W. J. Woods	5,500 0
G. Darling &		Water Car	
W. J. W. & Co.	5,795 00	Enginee- neering Co.,	
J. W. Ren- shaw.	5,789 00	Ltd.,	5,470 00
E. F. & Co.	5,780 00	T. Pease &	5,390 00
Co., Ltd.		C. Cruse & Co.	5,342 00

LONDON.—For the erection of lodge and entrance gates at Denmark Hill, for Mr. J. Wentworth Bell. Mr. W. G. Tatt, architect and surveyor, 18, Ironmonger-lane, E.C. 4.—
J. Appleby & Sons, 267 1/2 Turtie & Appleton .. £475
F. G. Minter..... 505

METHLICK (N.B.).—For erecting a villa, for Mrs. Berry. Mr. J. Cobban, architect, Haddo House, Methlick. Quantities by architect:—

Mason: A. Scroggie, Ellon.....
Joiner: J. Webster, Old Meldrum.....
Slater: W. Fyvie, Ellon.....
Plasterers: J. & J. Hutcheon, Methlick..... £1,000
Plumbers: J. Laing & Sons, Inverurie...
Painters: G. Donald & Sons, Aberdeen

NEWBURN (N.B.).—For a new Unitarian Free church. Messrs. Thomas & Wilkie, architects, 46, Reform-street, Dundee:—

Masons: A. & T. Craig, Dundee* .. £1,253 0 0
Joiners: D. S. & J. Anderson, Perth* .. 591 8 0
Plumber: D. Brown, Dundee* .. 125 0 0
Plaster: A. Beveridge, Newburgh* .. 81 15 8
Slater: J. Storrer, Newport-on-Tay* .. 120 0 0

PAISLEY.—For constructing two filter-beds and a clear water-tank at High Craigenfeoch Filters, near Johnstone, for the Water Commissioners. Mr. J. Lee, engineer, 13, Gilmour-street, Paisley:—
T. Black & Co., Paisley £5,513 0 8

PANGBOURNE (Berks.).—For four cottages at Pangbourne, for Mr. H. O. Gray. Mr. S. Couch-Johns, architect and surveyor, Land-chambers, Reading:—
J. Leech £1,250 0 0
G. H. Tucker 1,145 0 0
Stokes & Sons 1,169 0 0
F. Carter 1,028 16
East & Hyde 981 0
T. Stimpson 920 0

PURTON (Wilts.).—For erecting a dwelling-house at the Butts, for Mr. A. C. Russell. Messrs. W. Drew & Sons, architects & surveyors, 23, Regent-circus, Swindon:—
H. Flewelling, £397 17 6
Barnes & Sons 340 0 0

SANDERSTAD (Surrey).—For the erection of two pairs of semi-detached houses in Beechwood-road, Sanderstead, for Mr. A. D. MacRae. Messrs. Popler & Allen, architects, 8, George-street, Croydon:—
J. R. Rex £3,400 0 0
Grace & Marsh 2,559 10 0

SLEAFORD.—For erecting two pairs of cottages at Rauceby Asylum, for the Committee of the Kesteven County Asylum. Mr. Joseph Clark, County Architect, Sleaford. Quantities by County Architect:—
Newton & Maxey & Son, £1,242 0 0
Cooke £1,544 9 0
H. Rose & Son, 1,401 1 3
T. C. Armistead, 1,375 5 8
W. J. Berry, 1,312 0 0
Hockley & Co., 1,275 0 0

STAMFORD.—For erecting a free library, for the Library Committee of the Council. Messrs. Hall & Phillips, architects, 6, Gt. James-street, Bedford-row, W.C. Quantities by Messrs. Andrews & Read:—
J. Cracknell, £2,086 0 0
J. Gutteridge, 2,397 0 0
Rollering Co-operative Builders, Ltd., 2,340 0 0

WALSALL.—For erecting a senior mixed department for 300 children, Milton-street, Palfrey, and new classrooms and alterations, for the Education Committee. Messrs. Bailey & McConnell, architects, Bridge street, Walsall. Quantities by architects:—
H. Gough & Son, Wolverhampton £4,175

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Yorkshire Stone.

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WALLINGFORD (Berks.).—For erecting private residence at Wallingford, for Mr. G. Peck. Mr. S. Couch-Johns, architect and surveyor, Land-chambers, Reading:—
J. Knight £1,563 0 0
H. W. Godwin, 1,537 0 0
F. W. Romaln, 1,520 0 0
Fisher Bros., 1,155 0 0
Stokes & Sons, 1,138 10 0
Brasher & Sons, 1,003 10 0
Stimpson & Sons, 1,001 0 0

WALSALL.—For senior mixed school, Palfrey, Walsall, and alterations to present schools, for the Walsall Education Committee. Messrs. Bailey & McConnell, architects, Walsall. Quantities by the architects:—

Hadley & Sons, £5,476
F. L. Jones, 5,292
J. A. Meredith, 5,271
W. Sapcote & Sons, 5,157
J. Harley & Son, 5,137
J. Dallow, 4,900
W. Wistace, 4,836
E. Mallin, 4,830
H. Willcock & Co., 4,843
J. Hall & Son, 4,841
W. & J. Webb, 4,824
J. Herbert, 4,783
Oakley & Coulson, 4,781
Brockhurst & Wood, 4,731
W. H. Gibbs, 4,723
N. Round, 4,699

WALSALL.—For low-pressure heating apparatus to new senior mixed school and present buildings, Palfrey, Walsall, for the Walsall Education Committee. Messrs. Bailey & McConnell, architects, Walsall:—
E. Mantou, Walsall £440
[Recommended for acceptance.]

WHEATLEY HILL.—For erecting club premises and caretaker's house, for the Wheatley Hill Workmen's Social Club and Institute. Mr. H. T. Gradon, architect, 22, Market-place, Durham:—
Fountain & Milward, £2,185 0 0
Walker Bros., 2,185 0 0
E. M. Tweddle, 2,120 0 0
Draper & Sons, 1,970 0 0
G. Booth, 1,961 0 11
G. T. Man-son, 1,948 0 0

WIMBLEDON.—For erecting a coal order office station yard, for Mr. T. G. Mason, Wimbledon. Mr. R. B. Rowell, architect, Triangle-corner, East Sheen:—
Whitehead Bros., £140 0 0
Price & Price, 107 10 0

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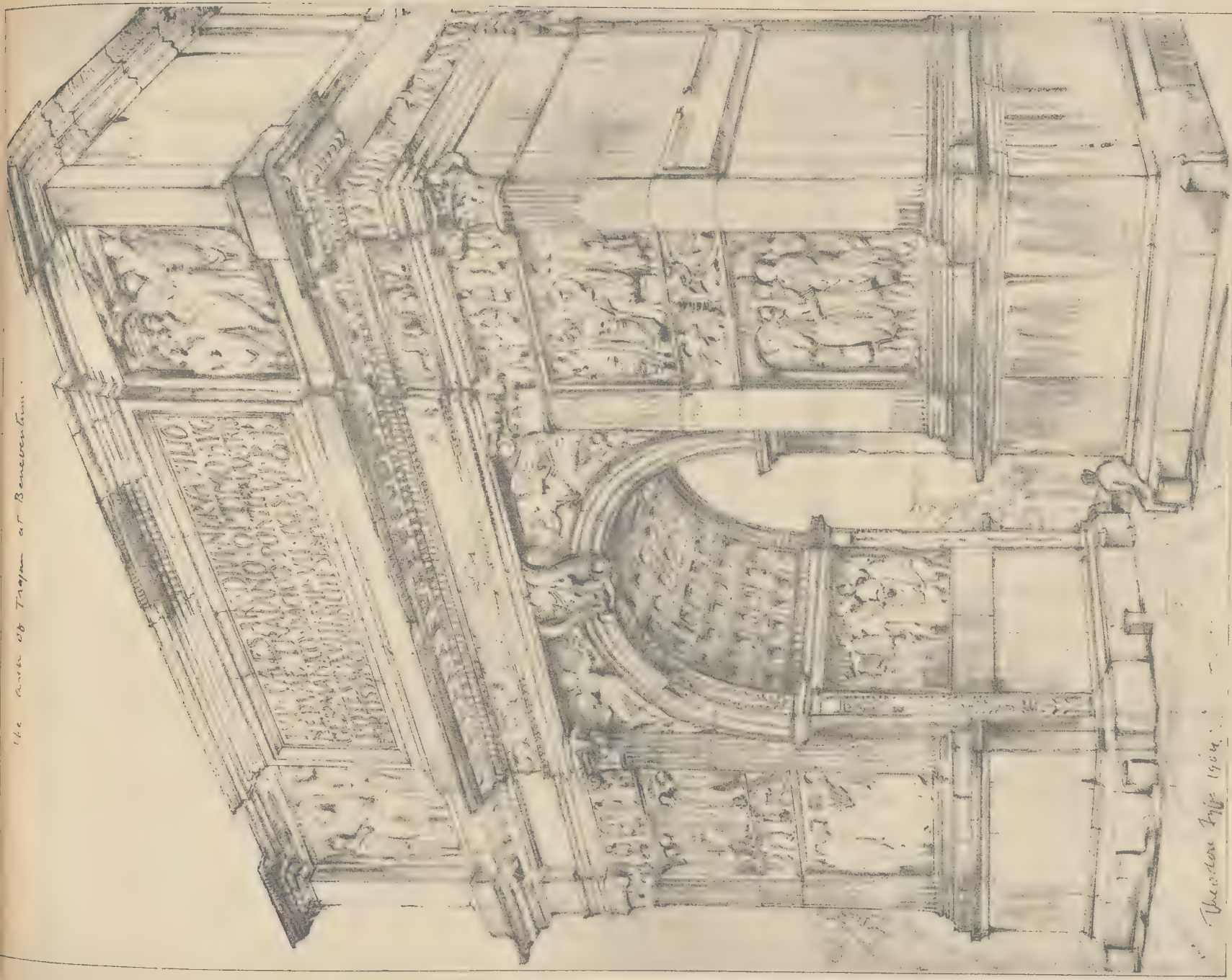
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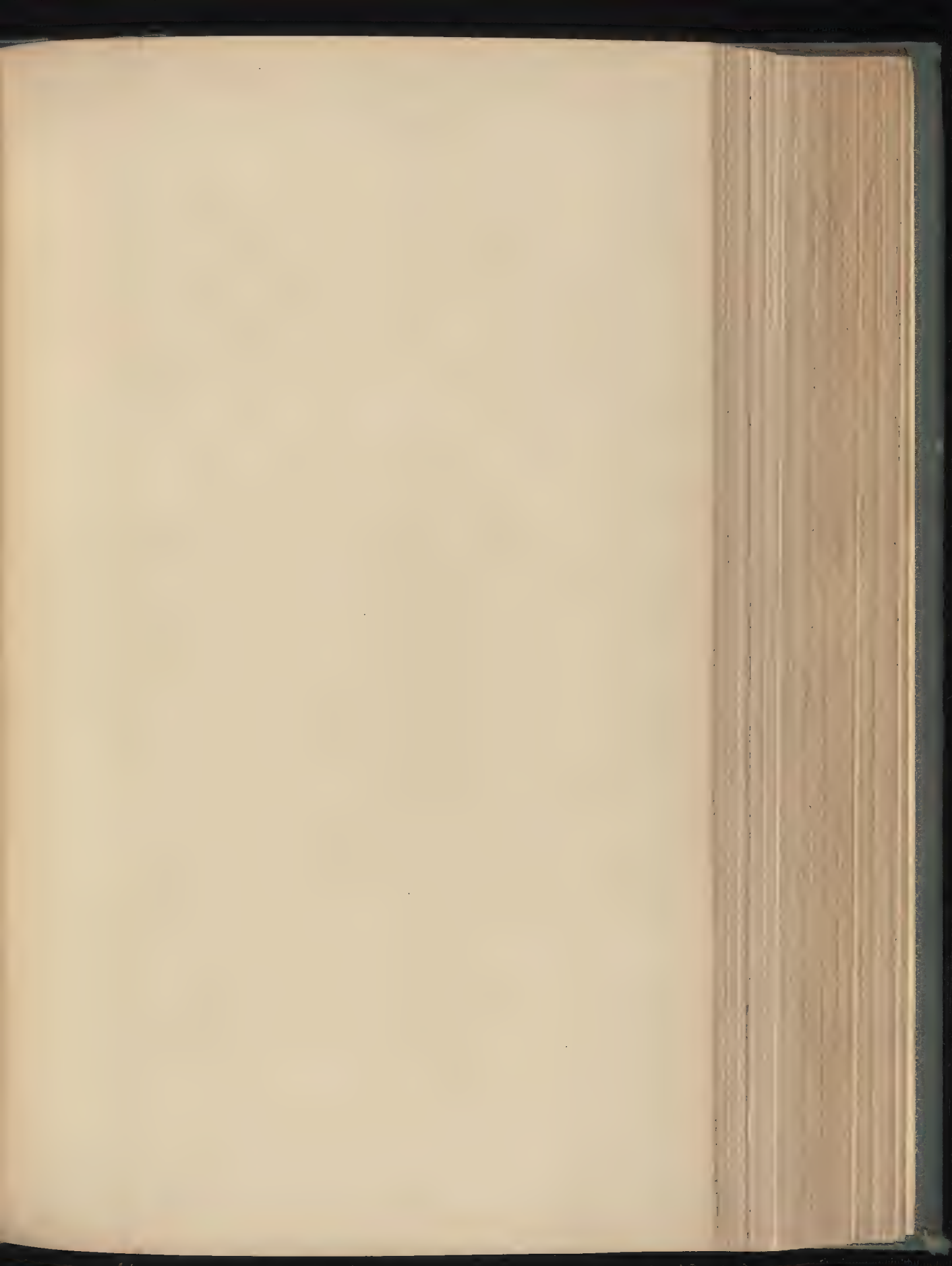
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164 Arch of Trajan at Beneventum.

Theodor Wieg 1904





MEDAL OF MEMBERSHIP, SOCIÉTÉ CENTRALE DES ARCHITECTES. DESIGNED BY M. CONSTANT-DUMEAUX. ENGRAVED BY M. OUDINE.



MEDAL FROM OLD PUELS, IN HONOUR OF M. PASCAL. BY M. CHAPMAN.



MEDAL PRESENTED TO MR. SPIERS BY THE SOCIÉTÉ CENTRALE DES ARCHITECTES. BY M. CHAPMAN.



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"ENFANTS ET GRENOUILLES": PLASTER GROUP FOR A FOUNTAIN.
M. MAX BLONDAT, SCULPTOR.



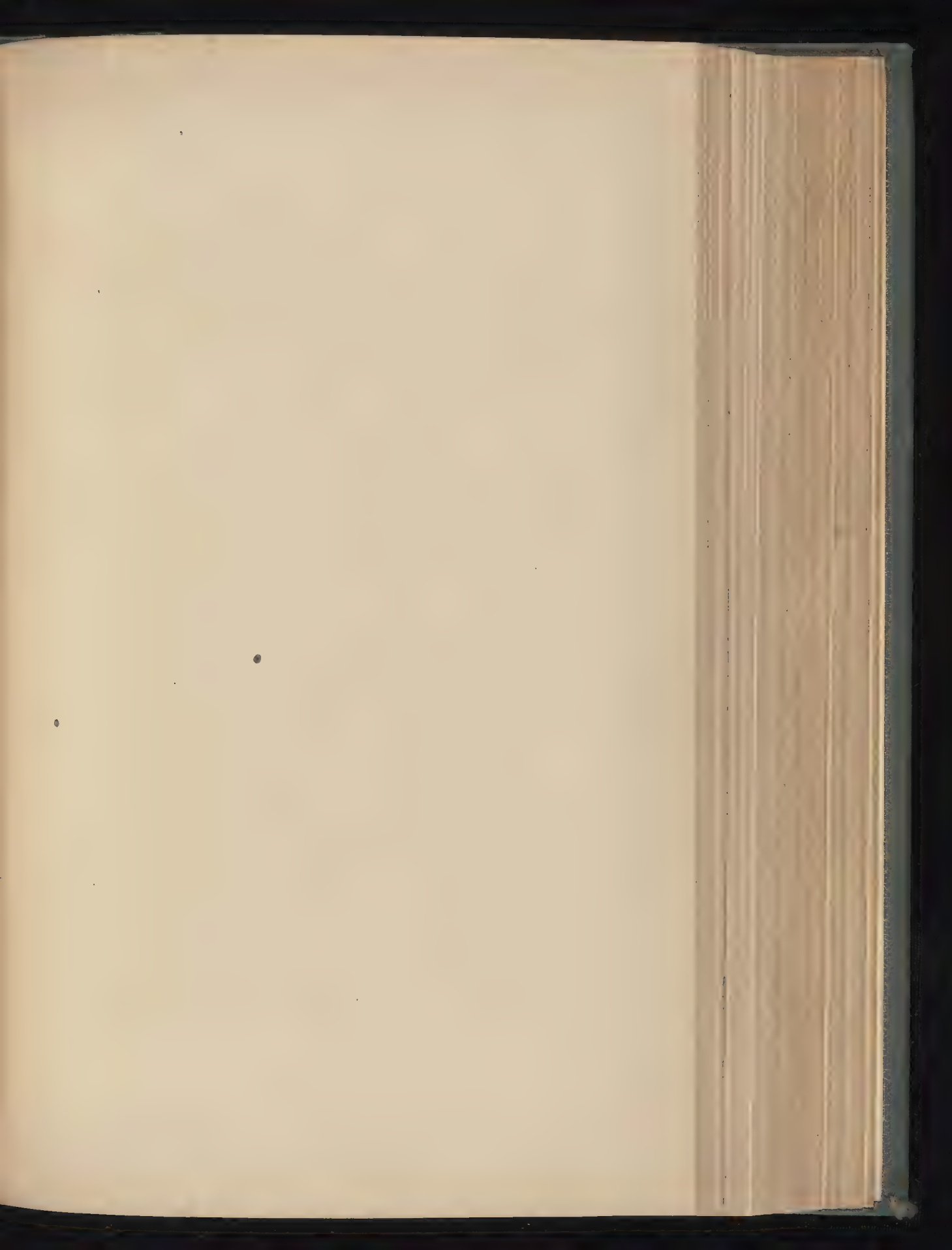
DETAIL OF ENTRANCE.



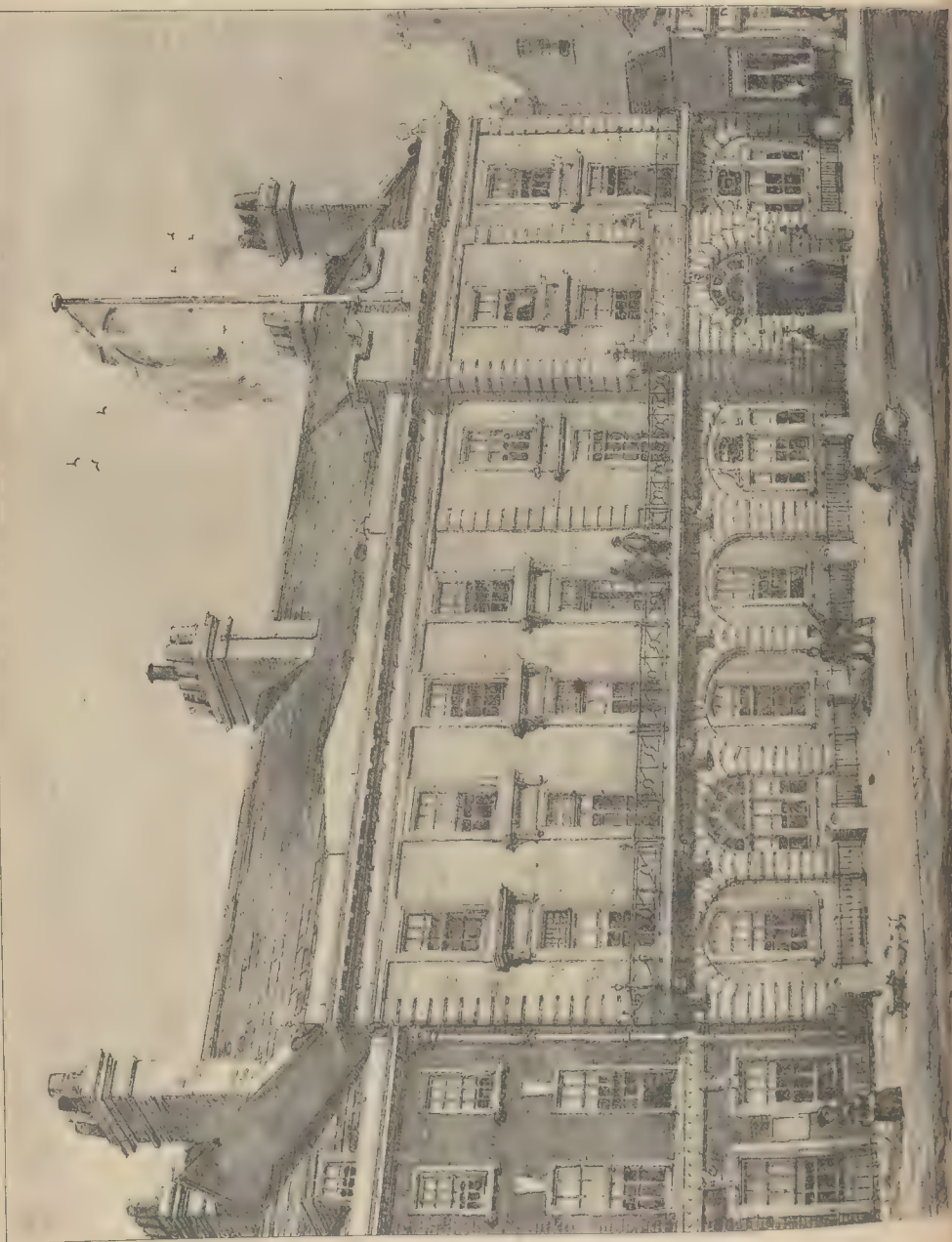
GENERAL VIEW.

HOUSE NEAR RUGBY.—MR. J. W. SIMPSON, F.R.I.B.A., ARCHITECT

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THE BUILDER MARCH 25 1905



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The Builder.

VOL. LXXXVIII.—No. 3543.

APRIL 1, 1905.

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Ancient Buildings at Famagusta, Cyprus.....	From Photographs.
Great House Court.....	Mr. E. Turner Powell, Architect.
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The Court of Appeal and Architects' Drawings.

THE case of Gibbon v. Pease has been heard in the Court of Appeal, as reported in our legal column, with the same result as in the original trial. The court

ruled that the precedent of *Ebdy v. McGowan* applies in every case, whether the building has been carried out or not, and again refused to hear any evidence from architects who could have thrown some light on a matter on which the learned judges were obviously under much and serious misapprehension:

That Law and Justice are totally distinct things we of course all know, or ought to know. "I thought your lordship was sitting there to administer justice," exclaimed a disappointed counsel to Lord Ellenborough; and was met by the reply—"Then you ought to know better, sir; I am sitting here to administer the law." And if judges are convinced, on legal grounds, that a particular precedent is the law, and is applicable to the case in hand, they have no choice but to administer the law; they are appointed for that function, and we cannot complain of them for exercising it. But there are one or two things of which we think the architectural profession have a right to complain. One is, that judges who evidently, from their own comments, are entirely unac-

quainted with the nature of architecture or with the functions of the architect, should nevertheless refuse even to allow those who could explain these things to them to have an opportunity of attempting to do so. It may be said that their explanation would not alter the law. No: but it would put a very different face on the matter. And this consideration is connected with the other complaint which we think architects have a right to make; viz.: in regard to the contemptuous spirit in which their claims of this kind are constantly treated in courts of law. A dry report of a law case does not indeed convey this; it is only those who are present in court at cases of this kind who can realise the spirit of ridicule in which English courts will meet claims from architects, the motives and foundation of which the court does not apparently even endeavour to understand. In regard to the Institute, too, over and over again we hear juries told pointedly that they are at liberty to disregard the Institute recommendations as to professional charges. Of course the Institute scale of charges is not law—we all know that; but why are juries almost always encouraged to give no weight to it? Surely they ought to be told the contrary. The Institute of Architects is the representative of a great and honourable profession; its ideas as to a scale of charges represent what the leaders of the profession regard as fair between architect and client, and in that sense they may be considered to be to some extent in the interests of the public also; if they

support the architects' claims up to a certain point, they are also a check on exorbitant claims, and have actually, we believe, been appealed to by clients on that ground. Yet they are seldom mentioned in a court of law except to be ridiculed. Why? Surely they form a reasonable presumption on which to assist the judgment of a jury as to what is fair between the parties.

The total misapprehension of judges as to the nature of the architectural profession was even more pointedly illustrated in the appeal case than in the original trial. It seems to be an *ad hoc* with learned judges in this country that an architect is a man who sells drawings, and will not part with them when he has been paid for them. One of the judges in the present case spoke of the drawings as constituting a "chattel," the property in which passed to the building owner when he had paid for it. Another actually cited as a parallel case that of a portrait painted on commission, and said that he supposed if he paid for the portrait it became his property. One learned judge said that he "could not see what interest the architect had in the plans." Well, if the defendants' witnesses had been allowed to give evidence, the judges would perhaps have learned what interest the architect has in them. Then another judge asked "what would happen if the building-owner wished to discover where the drains were laid?" On this point, which was perhaps unexpected, the counsel for the defendant does not seem to have been properly informed, as

he merely replied that he supposed the building-owner could ask the architect to let him inspect the plans. There comes again the mischief of not hearing evidence; if the counsel for the defence had had the opportunity to put that question to one of the witnesses for the defence, the court would have learned that it is the usual custom to supply the building-owner with a plan of the drains. But when the judges on the bench hold and express such really absurd misconceptions as to an architect's work and as to the very *raison d'être* of the drawings, and decline any information which might set the matter in its true light, the case is of course hopeless.


We must add, however, that the wording of the Institute document as to professional charges is most unfortunate, and very much increases the difficulty of dealing with the subject. By separately mentioning, in their Clause 5, the drawings and specification as representing the value of half the architect's commission, they have to all appearance, from the legal point of view, implied that which they do not wish to imply, viz., that the architect is paid for making drawings. We know that this was not the intention, but the wording would convey to most people that it was. But this is not the only consequence of that unfortunate piece of drafting. We do not undertake here, of course, to expound the law, but we are informed on good legal authority that if the Professional Charges codex had merely mentioned 5 per cent. on the cost as the proper architect's commission on a building, making the commission "indivisible," without attempting to divide up his work into drawing and superintendence, the legal result would have been that a client who had given a commission to an architect for a building and then abandoned it would have been liable for the whole amount of the commission. No architect, we should hope, would have wished to take advantage of the law to make the whole charge, but he would have had the right to do so, and no question about drawings need have arisen; so that in the drafting of this unfortunate clause the Institute has really been acting against its own interests and those of the profession.

After the experience of the Court of Appeal, it would no doubt be waste of time and money for the defendant in the case to take it to the House of Lords. under present circumstances at any rate. It now rests with the Institute of Architects to take up the question seriously, and with the determination to see it through, and not to rest until the law is altered. And the first thing for them to do is to thoroughly revise the wording of their document as to professional charges, so as to put it on a more logical footing. After that, they should endeavour to procure legal recognition of it, and get *Ebdy v. McGowan* wiped out. It is that unfortunate precedent, now interpreted in a totally unexpected fashion, which forms the real stumbling-block, and the Institute ought to make up their minds to get it reversed, and not rest till they have done so.

THE WHISTLER EXHIBITION.—It is announced that the Whistler Exhibition at the New Gallery is to remain open till the 15th inst.

ARCHITECTURAL EDUCATION: THE INSTITUTE'S NEW SCHEME.

By JOHN HONEYMAN, LL.D., R.S.A.

 HE architect, like the naval officer, now realises that the course of instruction to qualify for successfully engaging in the profession, which answered its purpose fairly well sixty years ago, is now out-of-date and inadequate. The Admiralty has decreed that a radical change shall be made in the instruction of naval cadets, and that the time up till recently occupied in learning and practising the duties of a seaman in a full-rigged ship shall be turned to better account by substituting instruction in the multifarious duties which may devolve on members of the crew of a modern sailless battleship. The Royal Institute of British Architects has not gone so far. It sees that the time has come when the young architect must acquire some knowledge of several special developments of science and art, but it is apparently unwilling to give up the old-fashioned system of apprenticeship and to devote the time which that necessarily absorbs to better purpose. It seems unable to get rid of the notion that a young man can find time to serve an apprenticeship and concurrently to spend a number of hours daily in acquiring the technical instruction which is now considered indispensable. And so it comes about that in the suggested course of instruction which was explained by Mr. Reginald Blomfield at a meeting of the Institute held on February 20 nothing is said about the substitution of the proposed course for an apprenticeship, but it is assumed that so much of the apprenticeship remains that an architect would be justified in asking the parents or guardians of a youth who came to him for instruction for a premium.

It is not very easy to see how this sort of apprenticeship is to be carried on concurrently with the other instruction, as there is a recommendation that only a part of one year and the whole of another is to be the length of the student's service in an architect's office. The proposed scheme is much in advance of anything that has been hitherto suggested. Barring this attempted retention of an apprenticeship, it is a commonsense adaptation of the course of instruction to the altered circumstances. An apprenticeship lasting five years was not too prolonged to serve its purpose, but it is absurd to say that this can, with any practical result, be condensed into a period of a year and a half. At the commencement of this proposed apprenticeship the pupil has practically become qualified to act as a draughtsman without the aid of the architectural master at all. He is—if he has availed himself of the tuition which he is recommended to obtain during the preceding three years—very much better qualified to be regarded as a draughtsman than anyone who, under the old system, had served an apprenticeship of five years. To suggest that, qualified in this way, he is only beginning his apprenticeship, either of one or two years, is ridiculous, and certainly shows little appreciation of the value of the course of study recommended; and to suggest that, in the circumstances, parents and guardians might reasonably expect some

modification of the usual premiums is simply amusing. There is no longer any excuse for asking or accepting a premium, as there is no longer an apprenticeship. That method of teaching has been superseded by another, which the Education Board of the Institute and the majority of architects believe to be superior. But the collateral consequences of the substitution must be frankly accepted, and one of these clearly is the abolition of apprenticeship and the placing of the practising architect exactly in the same relation to the student as the teacher of building construction or any of the other teachers under whom he studies.

Suppose the course extends over five years. During the first three and a half years the student has to pay his instructors, and it is quite right that during part of the fourth and the whole of the fifth he should do the same. He should pay the architect who receives him into his office the value of the instruction he gets, and, as an accomplished draughtsman, he can do this, and give this last teacher a much higher rate of remuneration than he has given any of the others, simply by serving him gratuitously for a year and a half.

Under the old system an apprentice was worse than useless for several years, and his period of usefulness hardly made up for this, and hence there was some excuse for requiring a premium to make up the deficiency; but there never was, and hereafter there never can be, any excuse for the Pecksniffian practice—still not uncommon—of an architect taking half a dozen pupils or more at a time, and premiums with each of them, to do his work gratuitously.

The result of the change in the system of education suggested by the Institute, if the true position of the architect is recognised, will be that every architect will be obliged to employ a sufficient staff to do his work without depending on apprentices.

The Institute's wise recommendation that during the first two years of the course the student should not serve in an office is one which anyone who takes a real interest in technical education must readily endorse. In this respect the present state of matters is about as bad as can be. In regard to architecture, at all events, ever since the Institute decreed that qualifying examinations were compulsory, there has been an attempt to combine two systems which are irreconcilable, resulting in a great waste of energy. The figure of a five years' apprenticeship is maintained, the student spending his valuable time in the office from 9 till 5.30 or 6 in what any intelligent message boy would learn to do in a few months: copying letters, filing letters and catalogues, going messages, holding the ring end of measuring tapes, tracing plans, helping to print tracings, mounting sheets, printing titles, and making himself generally useful, even to the carrying of his master's portmanteau to the station! * All these things, no doubt are more easily learned at sixteen than at twenty, but as they are not accompanied by even a pretence of tuition on the part of the master, it would be interesting

* We presume Mr. Honeyman has meant to say that though we certainly never knew of such an instance, it is not impossible.

know what anyone in favour of the present system has to say about the relative value of time spent in that way and the same time spent with competent teachers in the School of Art and the lecture-rooms of a technical college. It is high time we understood that one or other must be given up, and that the hours of obligatory work must be restricted to a reasonable number each day. At present, a young man is expected to do all the work of an apprentice and at the same time all the work to qualify him for the Institute's examinations. Attempting to do this, the usual daily routine is something like this: He gets up at 5.30 to do some work for his class, which has to be done at home; he breakfasts hurriedly at 8, and goes off to his office for the day, where he remains (except during lunch) till half-past five; then, to get to his class at college, he must dine hurriedly at 6 and go off immediately, not to return till ten—sometimes later: He has absolutely no leisure to cultivate science, art, or literature, or even social frivolities, which would only do him good—it has all been wasted during the day. In my opinion, the daily time to be devoted to obligatory work should not exceed nine hours during the whole of the student's prescribed course. The earnest student will devote more time than that to study, but he should not be obliged to do so. He has many things to learn before he is twenty-one besides his profession. So has every man; but we seniors seem to have forgotten the fact. Let us, then, be content to do one thing at a time and to do it well, even if it should add another year to the full course.

I shall only refer at present to one other matter, regarding which we at present greatly err, namely, as to the time the student should have at his own disposal as holiday. The student of the present day, as I have described him, notwithstanding his hard winter's work, gets—besides the usual public holidays—only one fortnight in the twelve months! He works all the year without getting any remuneration, and is thought to be sufficiently favoured if he gets one fortnight to himself. Now in no profession can a lengthened holiday be turned to better account as a means of education than in architecture. The student ought to have not only enough of time for recreation, but also for sketching and measuring and visiting interesting localities; and the higher he rises in his course of study the more time should he get for engaging in work of this kind, as he is then better qualified to make good use of his opportunities than at an earlier stage. I, therefore, venture to recommend that while a student in his first year should have a month, the student in his last year (in an architect's office) should have two, a graduated scale between the two extremes being applicable to each intervening stage.

No doubt it will be said that under such conditions as I have sketched young men would waste their time with cricket, golf, or drill; but if the student applies himself diligently to his work nine hours daily, he is quite welcome to devote himself to these and other pastimes in moderation, and will be all the better man and architect if he does so. The risk with any man

likely to rise in his profession is that he will work too hard. As it has ever been, and must continue even in these days of higher education, the issue will depend on the natural endowments and conduct of the individual. The best and most abundant educational advantages will never convert a fool into an architect worthy of the name.

In the discussion which followed the reading of Mr. Blomfield's paper, to which reference has been made, there does not seem to have been anything said about the Institute's examinations, so that the qualifications for Associateship would remain unchanged. The scheme suggested was, of course, intended for the whole profession, leaving different associations free to make what rules they chose for admission to their membership; which is as it should be. But it might have been well had the details of the course been a little more filled up by some reference to what the student should do during the first and second summers of his course, when classes are discontinued: I will venture to make a suggestion on this point. During the first summer I think the very best thing the student could do would be to go into the counting-house of a merchant or accountant, to get some idea of the advantages of punctuality and orderliness—the immense importance of the economy of time and trouble which results from having "a place for everything and everything in its place." This is a branch of the architect's instruction which has been sadly neglected, and ought to be embraced in any complete course of instruction. During the second summer he should go into a surveyor's office, so as to get some insight into the mysteries of quantity surveying and specifications. Lastly, during the fourth year—summer and winter—the student's time should be equally divided (keeping the nine hours' limit constantly in view) between work in an office and the higher artistic branches of his academical course. He should give four and a half hours, and no more, to office work, and the same time (and as much more as he pleases) to the other. It will no doubt be objected that a practising architect would not take a draughtsman into his employment who would only work half time, but two things are to be remembered here—first, that the architect has in his employment a sufficient staff to do his work without the aid of pupils; and, second, that the student does not ask employment as a draughtsman, but as a pupil willing to pay for his instruction. He is—or should be, if he is ever to be—an accomplished draughtsman, and giving his half-time services to an architect for nothing he actually pays three or four times higher fees than he has paid any of his other instructors.

During the fifth year the young man should devote his whole time to office work, still to some extent in the capacity of pupil, but to so small an extent that, in common fairness, he ought to receive a restricted salary in proportion to his worth.

This is all so inconsistent with the established order of things—which people are prone to forget has, by their own act, been overturned—that it will very likely be said, "What architect in large practice, besieged by importunate would-

be improvers, would take young men into his office on such terms as these?" If they really have the interest in the education of those who are to fill their places by-and-by which they profess to have, they will be glad to do so; and if not, I can assure my young friends that it will be of very little consequence to them, for they are much more likely to learn the routine work of an office, and the duties which will devolve upon them when they start for themselves, in a small than in a large establishment. I would recommend, preferably, an office where not more than one draughtsman is kept, and where they will be in constant communication with the head. A youth will get very little insight into such matters in an office where a secretary, book-keeper, typist, porter, etc., are all employed. The beginner must learn at first to be an architect and all these besides, and he will learn that best from one who has successfully accomplished the task himself. But it is of no advantage to a young man that he should see and be influenced by the work done in the office of a great master. On the contrary, it is the worst thing possible for him as an artist to have his taste twisted in any direction. There is no endowment he possesses which is so precious as originality. If as an artist he would produce any noble work, if he would throughout the whole of his career realise the inspiring truth of the adage, *Labor ipse voluptas*, let him rely upon himself alone and do his best—let him cherish originality, breadth, and truth.]

NOTES.

Hope for
Phila.

THERE seems to be a possibility that, after all, the decision of the Egyptian Government to raise the level of the Assuan dam may not be carried into effect. As the result of an inspection extending over some fourteen days, Sir Benjamin Baker has recommended that a masonry apron should be built in front of the downstream face of the dam to prevent the serious scouring away of the river bed by the large volumes of water passing through the sluices. The completion of this work will occupy quite two years, and until it has been done it would be extremely inadvisable to attempt the raising of the dam. If this were all, we should have no hope of anything but a postponement of an untoward event. But it happens that since the elevation of the masonry was decided to be quite feasible, mathematicians have evolved a new theory—or more correctly have developed an existing theory—as to the stresses upon masonry dams, and it is possible that the application of this to the Assuan dam may show that it would be impossible to raise the water level in the reservoir without unduly reducing the large factor of safety essential in the case of so important a structure. A very ample margin was allowed in the final designs, but if investigation should prove that the latest theory is applicable to this dam, the actual factor of safety will evidently be such as to preclude the storage of more water at Assuan. In that event, it is morally certain that a second reservoir will be established upon some other site,

and that Philæ will be spared further submersion.

A Welcome Postal Reform. THE partial removal of the final barrier of any importance to an Imperial Penny Post deserves passing notice. From April 1 the postage on $\frac{1}{2}$ oz. letters for Australia will be reduced from 2 $\frac{1}{2}$ d. to 1d., and Mr. Henniker Heaton and his fellow reformers will rejoice. Our Commonwealth friends themselves, however, only get a reduction of a halfpenny on letters sent to the Mother Country, and it will be interesting to see how long it will take them to fall in line with their New Zealand brethren, and come down to the popular penny. They will hardly rest content to pay twice as much as we do for the same service, in spite of the loss of revenue which a further reduction would involve. The thin end of the wedge was inserted in 1897-8, and it will probably not be long before it is finally driven home, and Imperial Penny Postage becomes an accomplished fact—marred by no exceptions.

An Absurd Proposal. MR. FREDERIC HARRISON, one of the class of brilliant literary men who think they understand everything, has proposed in a letter in the *Westminster Gazette* to find a house for the London County Council by the simple expedient of ceding to them Somerset House, with the suggestion that "an adequate hall could be raised in the great square." That a building for the convenient carrying on of the work of the County Council would have to be specially and carefully planned for that purpose is a detail that evidently does not occur to the literary mind; but it might have been supposed that any man who professed to take an interest in art would have seen the absurdity of the proposal to "ruin the effect of the quadrangle" of Somerset House by erecting a large building in the centre of it. And what about light and ventilation?

Coutts and Co.'s (old) Bank, Strand. HAVING acquired the leasehold interest in Nos. 56-60, Strand, for a premium of 8,000*l.* and a net rental of 2,485*l.* per annum, the London County Council will adapt the premises for the purposes of their staff, and rearrange the ground floor for conversion into shops. The north portion of the block stands on the site of the Burse of Britain, commonly known as the New Exchange, built in 1608-9 by Lord Salisbury on the site of the stabling and some outhouses of the "inn" of the Bishops of Durham. In 1761 Thomas Coutts became a partner of his brother James, whom George Campbell, goldsmith and banker, had taken into partnership at his banking-house, by the sign of the Three Crowns, in the Strand. Robert and James Adam rebuilt the banking-house (with a subway to the strong-rooms on the south side of William-street, Adelphi), which Thomas Coutts occupied as his residence during many years before his decease in 1822. At the time of the building of the Adelphi he stipulated with Robert Adam for the diminished height of a house on the north side of John-street and for the laying-out of Robert-street in order that he might continue

to enjoy the prospect from his drawing-room across the river and the view beyond. In 1799 he obtained an Act "to make a communication between his buildings on the opposite sides of William-street . . . by a covered passage to be built over the said street." On E. Waters's survey of the parish of St. Martin-in-the-fields, 1799, is plotted the Baptist Chapel at the angle, south-east, of William and James streets. That building, still known as "the chapel," was incorporated in the banking-house some years ago, the congregation migrating to Hackney. In 1838-9 some alterations and improvements were carried out by Thomas Hopper for the firm who, in June, 1892, were reconstituted as Coutts & Co.

Kirkstead Chapel, Lincolnshire. An appeal is made to the public on behalf of the chapel at Kirkstead, which formed the Capella Extra Portas of the Cistercian Abbey, near Tattershall, and in that respect is one of the few examples after its kind that now remain in our country. It appears that the chapel, which is extra-parochial and a donative, belongs to the vicar of Appleby Rectory in Leicestershire, who executed some repairs a few years ago, and, it is stated, is willing to effect a sale of the building with a view to its preservation provided the purchase extends to the entire estate of about 1,500 acres of fen land, together with its farms, cottages, and other buildings. The Abbey, dedicated to St. Mary the Virgin, was founded at Kirkstead in the earlier half of the XIIth century by Hugh Fitz-Eudo, surnamed le Breton, and subsequently became the parish church of the village, constituting a "peculiar" in the private possession of the owners of the estate. The Capella Extra Portas was built, it is believed, by Sir Hugh de Tatshall in or about 1140. It measures 42 $\frac{1}{2}$ ft. by 19 $\frac{1}{2}$ ft., and consists of three bays; the weight of the vaulted roof threatens the walls with destruction unless measures are promptly taken to avert disaster.

The Carfax Gallery. MESSRS. CARFAX & Co. have opened their new premises at 20, Bury-street, St. James's (which are got up in a very æsthetic style), with an exhibition of water-colours by Mr. Sargent. These are really only sketches, in a very broad and rough manner—an artist's memoranda, they might be called; but they are interesting both from their remarkable qualities of colour and for the power which they show of rapidly seizing the momentary action of a figure, in those in which figures are introduced. We see this in "The Grand Canal" (24), where the roughly-sketched figure of the gondolier is in such energetic action; in the groups of Spanish soldiers (44, 45), and in the manner in which the forward action of the Colleoni statue is indicated (6). Most of them, however, are sketches of buildings, chiefly in and about Venice, and these are full of colour and light. There is also exhibited a life-size portrait of a lady, which looks as if the size of the head and the length of the nose had been purposely exaggerated in a spirit of mischief; it is not in any respect a work to add to the painter's reputation. His remarkable nude study of a bronzed

Egyptian girl with her back to the spectator (of which we have seen more than one reproduction in art publications) is very fine, but too large for the room. The small gallery is very well lighted, but its dimensions only render it suitable for the exhibition of small works; a life-size figure is out of scale there.

The Modern Gallery. THE series of "Water-colours of England and South Wales," by Mr. Arthur Ellis, now on view at the Modern Gallery, is to our mind the most satisfying collection of works which we have seen there since the gallery re-opened at its new premises. They are but small drawings, but they are in a fine and true water-colour style and show real feeling for the effect and the sentiment of landscape. "Stormy Sky, St. David's"; "Penrice on the Hill"; "Blown Sand, Oxwich Bay"; and "St. David's" (Nos. 3 to 6) are all fine in colour and effect. There is a larger and powerfully treated view of "Durham" (29), red in the western sunlight above its foreground of foliage; "The Valley of the Jed Water," next to it, is also very good; and a very slightly executed sketch, "On the Sussex Downs" (31), is one of the best things in the collection for truth of colour and effect.

Society of British Artists. THE Exhibition of the Society of British Artists, at the Gallery in Suffolk-street, is a better one than some that we have seen; there is no doubt a great deal of uninteresting and mediocre work, but there is a larger number than usual of pictures which one can look at with some interest. Among these Mr. Muirhead's "Clearing: after a Storm on the French Frontier" (17), though rather too dark and rather too much like an imitation of an older school of painting, is nevertheless powerful; and Mr. Footet, in his impressionist picture "The Barge, Twilight" (22) has chosen a subject that suits that style of treatment—much more so than his Pastoral in another room, which looks like a picture executed in worsted work: "An Idyll—Twilight" (27), by Mr. Palin, merits notice, though it reminds one that Fantin-Latour and Henner have done the same thing much better. Mr. Val Davis's small picture "The End of the Village" (65) is a really pleasing though unassuming little landscape; also Mrs. Merritt's "The Down" (77). Mr. Rex Vicat Cole's large woodland landscape "Wharfedale Woodlands" (84), which is not unassuming but rather pretentious, is nevertheless an effort at a difficult effect treated with considerable power. In Mr. Sidney Lee's "The Bridge" (193) we can trace, but not unpleasantly, the influence of M. Le Sidaner. The water-colours, as usual at this exhibition, maintain a higher general level than the oils, and include a good many pleasing works.

Drawings by Mr. Corboud. THE collection of drawings—mostly black and white but some in colour—which is on view at the Quest Gallery, in New Bond-street, belongs to the class which are "exhibitions of sporting subjects," and one knows that under that title one

not look for anything expressing the serious or poetic side of art. But it is an exhibition which gives one the kind of satisfaction arising from work which is thoroughly good of its kind. Mr. Corbould knows the horse and the huntsman and the hunting lady in every line, and perhaps the horse is the most interesting of the three. The admirable way in which horses are drawn from every point of view, and the truth with which their action is indicated, are really remarkable, and the designs are in this sense full of variety. We may call attention especially to the excellent drawing, in the small oil-painting numbered 9, of the foal capering and foreshortened. There is of course a great deal of humour in the subjects of many of the drawings, and the incidents they are supposed to illustrate, but this is something beside and independent of the artistic element. There are others in which the humour is in the drawing itself and not in the title; witness "Selling a Horse" (24); the expression of the dealer is delightful.

At the Dutch Gallery in Grafton-street there is a collection of paintings of flowers by Mr. Francis E. James, which show a great deal of power and brilliancy in colour, and effective grouping of flowers in the form of Still Life pictures. It is, however, colour and arrangement only, not much of the texture or structure being indicated. This is particularly observable in the drawing of "Nasturtiums" (49). The special character of the nasturtium leaf is derived from the peculiar construction of the circular leaf with a central point out of the centre so to speak (like the focus of an ellipse), and the ribs which form the leaf structure radiating from it. All this is omitted in the drawing, where the leaf shows only as a green circle. That is hardly the way to paint a leaf—to give its colour only and leave out the most essential point in its design.

At Mr. Dunthorne's gallery in Vigo-street there is a collection of "Studies of Birds in Water-colour," by Mr. Geo. E. Lodge, which is well worth seeing. They are simply paintings of birds, with very slight indications of landscape; but the birds are finished with the greatest brilliancy and delicacy, and form quite an ornithological study. Among those that are particularly worth mention are that of a "Sea-Eagle" (1) represented flying high in the air; a "Golden Eagle" (6) that "grasps the crag with crooked hands"; "The Sparrow Hawk" (17); "Sea-Eagles" (37), with their wings spread out to dry; "Waxwings" (40); and "Wigeon" (52)—so in the catalogue, but we should say "widgeon" is the correct spelling). The plumage of the nearest bird in this drawing is an admirable bit of minute finish, and the whole collection shows most conscientious workmanship.

POORHOUSE EXTENSION, DUNFERMLINE.—Building operations will shortly be commenced at the extensions to the Combination Poorhouse at Dunfermline. The additions will cost, it is estimated, between 8,000L and 9,000L. They consist principally of two new blocks to the east and north of the present buildings. Mr. Muirhead, architect, Dunfermline, has prepared the plans.

THE AUTOMOBILE EXHIBITION, ROYAL AGRICULTURAL HALL.

REMEMBERING that we have recently had two other motor vehicle shows, the promoters of the annual Automobile Exhibition held last week at the Agricultural Hall have reason to be satisfied with the results attained. Indeed, in the fact that the hall was well filled in almost every part we find one more proof of the substantial progress made by the motor industry in Great Britain.

Some of the leading makers were not represented, owing to the opposition offered by the Society of Motor Manufacturers and Traders to the holding of more than one annual exhibition of the kind in or near the Metropolis, but the exhibits were sufficiently numerous and varied to give visitors an excellent idea of the vehicles and accessories now being made in this country. In the following notes we deal chiefly with heavy motor vans, some of which were to be found in the great hall and the remainder in the adjoining minor hall.

Passing along the northern wall of the building we came first to the stand of the St. Pancras Ironwork Co., who exhibited a 5-ton steam wagon, the chief feature of which is the adoption of what is generally known as the "three-point" contact system, permitting the wheels at one side to pass successively over an obstacle without causing the severe twisting strain that happens in the case of rigidly-built frames. Closely adjoining was a 4-ton steam lorry made by the Thames Ironworks Shipbuilding and Engineering Co. at their Greenwich works. This lorry is of the present year's design, and is provided with a locomotive type boiler and a compound horizontal self-oiling engine entirely inclosed. The same firm also showed a petrol delivery van with two-cylinder motor and solid rubber-tyred wheels. Messrs. John Stewart & Son, of Blackwall Ironworks, exhibited a steam lorry which can be converted into a wagon by the addition of a suitable body, and is capable of drawing two tons on a trailer in addition to six tons on the platform. The special features of this design are exceptional simplicity and an ingenious elastic spring drive, neutralising the shocks on the gearing, engine, and frame generally. The boiler is of the vertical fire tube type, working at 200 lb. per sq. in., and motive power is provided by a long stroke engine of the compound link motion type, but high pressure steam can be admitted to both cylinders when required for starting purposes and hill climbing. All the foregoing vehicles are of quite recent introduction, and, being made in London, should commend themselves for use in the Metropolis, owing to the ready accessibility of the makers' works for repairs or renewals. A very handy little traction was exhibited on the next stand by Messrs. W. Foster & Co., of Lincoln. For many purposes a tractor of this kind should be found extremely useful. The example now in question is capable of hauling loads up to eight tons at a speed not exceeding six miles an hour. It is fitted with a special arrangement of water tanks to enable long journeys to be undertaken, and any type of existing vehicle can be attached as a trailer. The machine is also fitted with a drum and rope for use as a portable winding engine. The Bristol Waggon and Carriage Works Co. had on view a 5-ton steam wagon with tipping body, and fitted with horizontal compound reversing engine and tubular boiler.

Along the southern wall of the building a few other vehicles of the same class were found worthy of inspection. Dougill's Engineering Co., of Leeds, showed one of their latest pattern 2-ton "Frick" petrol lorries fitted with double friction transmission, giving a variable gear in either direction from one and a half to twelve miles an hour, the change speed gear being operated by means of a hand wheel on the steering pillar. The same firm also exhibited a light delivery van of 8 cwt. capacity, with driving gear similar to that on the lorry.

Messrs. Soammell & Nephew, whose speciality is the building of bodies for motor waggons, omnibuses, and cars, included among their exhibit a trailer capable of carrying a load of 4 tons, and which, being fitted with movable sides, is suitable for a great variety of purposes. Messrs. R. Garrett & Sons, of Leiston Works, Suffolk, presented an example of their 4-ton steam lorry, very similar in outward appearance to other vehicles of the same general type, but combining one or two novel features. The first of these is a "controller cylinder," for the piston of which three distinct positions are indicated on the operating lever. In the first

position high-pressure steam is admitted directly into the low-pressure cylinder, at the same time opening a way from the high-pressure cylinder direct to the exhaust pipe. This position is useful when extra power is required temporarily. The second is the normal working position, and steam then passes from the high-pressure to the low-pressure cylinder. In the third position steam is admitted only to the high-pressure cylinder, none entering the low-pressure cylinder. This mode of working is useful in dense traffic, as the engine can be stopped immediately, thus adding materially to the control of the lorry.

Next entering the minor hall, we found a varied but not a very large selection of heavy motor vehicles. The Lancashire Steam Motor Co., of Leyland, exhibited a 5-ton brewer's dray and trailer of their standard type and a Crossley-Leyland omnibus which has been built for use between Kew Bridge and Surbiton. Messrs. Fodens, of Sandbach, were represented by two 5-ton steam waggons of their well-known standard design. In this type of wagon a horizontal multitubular boiler forms the front part of the framework, and the engine is placed on top of the boiler. As the general arrangement is very similar to that of an ordinary traction engine, any driver accustomed to such machines can readily handle the wagon. On the next stand we had the "Manchester" steam wagon, patented by Dr. Brightmore, M.Inst.C.E., which embodies the principles of traction that have been applied for centuries to horse-drawn vehicles. In the "Brightmore" system the motor drives the front wheels, the fore-carriage is connected to the platform by a ball-and-socket joint, and is kept parallel by a roller moving in a segmental channel. This method of connexion allows the front axle to take any angle relative to the back axle, either in the horizontal or the vertical plane, thus permitting the vehicle to accommodate itself to any unevenness of the ground without strain on the springs. Steering is effected by means of a wheel which applies the steering brake on one side or the other of the differential gear, thus causing the road wheel on the opposite side to revolve more quickly than its fellow and to turn the fore-carriage to the extent desired. Any deviation of direction when steering is not taking place is prevented by means of a device which ensures the uniform revolution of the front wheels. Finally, the load is carried equally by each of the four wheels.

Messrs. F. G. Pickering & Co., of Berwick-on-Tweed, exhibited a carefully-designed 2-ton petrol lorry, with 24-brake horse-power four-cylinder motor, and examples of the Pickering twin spoke wheel suitable for any class of vehicle. The object of the twin spoke is to divide the lateral strain so that each side takes up its own share, thus rendering the wheel far stronger than one of the ordinary type and providing against the effects of twisting strain or impact. The "Londonderry" steam wagon, built at the engineering works of Lord Londonderry at Seaham Harbour, was a noteworthy exhibit. The vehicle on view was one of the type which accomplished the record of carrying a 5-ton load from Seaham to London in fifty-four hours, only stopping to pick up water on the journey of 280 miles.

Messrs. J. Robertson & Son, of Fleetwood, exhibited a 5-ton hydraulic tip wagon fitted with a special control valve. Motive power for traction is provided by a steam engine of the usual kind supplied from a Robertson patent boiler, a specimen of which, with the outer casing removed, was exhibited on the same stand. Mann's Steam Cart and Wagon Co., of Hunslet, are well known as pioneers in heavy motor traction, and exhibited two waggons, of 2 tons and 5 tons respectively, embodying their latest ideas. In these the engines and fast-running gear are enclosed in an oil bath, and driving is effected entirely by spur gearing. The boiler of each wagon is of the locomotive type fired from the side so as to save space, and coke bunkers are fitted round the front. Among other exhibitors of steam waggons were Messrs. E. S. Hindley & Sons, The Hercules Motor Wagon Co., of Manchester; Messrs. Jesse Ellis & Co., of Maidstone; The Yorkshire Steam Wagon Co., of Hunslet; Messrs. Stagg & Robson, of Selby; Messrs. Wallis & Stevens, of Basingstoke; and Messrs. Savage Brothers, of King's Lynn. Although there was nothing in these exhibits requiring special mention, all of them are strong, serviceable machines well worth examination by intending purchasers. Petrol lorries were further represented by

the vehicles of the N.A.G. (Neue Automobil Gesellschaft) Automobile Co. of Great Britain and Ireland, and Messrs. Moss & Woodd, the stand of the latter firm also including an "Orion" motor omnibus.

The bulk of the exhibits in the great hall was made up, as might be expected, of ordinary motor cars, but among these were several omnibuses and delivery vans which deserve a few words. Mr. Theo Masui exhibited a "German" double-deck omnibus of 16-22 horse-power; the Maudslay Motor Co., of Coventry, in addition to a motor omnibus of the type adopted for local road services by the Great Western Railway Company, and the Motor Car Emporium a serviceable-looking double-deck omnibus to carry thirty-two to thirty-six passengers, and on the same stand a 1½-ton delivery van and a small petrol lorry. As on previous occasions, the makers of internal combustion engines such as the Crossley, the Stockport, and the National were in evidence in the hall, and makers of motor accessories had numerous exhibits in the arcade and galleries as well as in the hall itself.

Although coming second in order of importance to the show at Olympia, the recent exhibition may be characterised as a distinct success, and one of its most interesting features was to be found in the various exhibits of waggons and lorries adapted to industrial and municipal purposes.

THE ARCHITECTURAL ASSOCIATION.

An ordinary fortnightly meeting of the Architectural Association was held on Friday last week at No. 18, Tufton-street, Westminster, S.W., Mr. E. Guy Dawber, President, in the chair.

The minutes were read and confirmed, and the following gentlemen were elected members, *i.e.*, Messrs. S. Selwyn, Reigate; J. C. Cavanagh, London; and P. St. Clair Christie, Hampstead, N.W.

New Premises Fund.

The Chairman said he had pleasure in announcing the following further donations to the New Premises Fund, *i.e.*:-

	£	s.	d.		£	s.	d.
The Carpenters' Co.	22	5	0	T. J. Wetherall ..	2	12	6
F. and H. Higgin	25	0	0	J. B. Chubb ..	1	1	0
Chas. Smith & Co., Ltd.	10	10	0	Ewart & Sons, Ltd.	1	1	0
Bath Stone Firm, Ltd.	5	5	0	W. H. Hewish ..	1	1	0
R. C. Murray ..	5	5	0	E. E. Lofting ..	1	1	0
Nottingham Archl. Society	5	5	0	H. P. G. Maule ..	1	1	0
G. P. Bankart ..	4	4	0	Maurice E. Webb ..	1	1	0
Holliday & Greenwood ..	8	8	0	T. H. Russell ..	1	1	0
Geoffrey Lucas ..	2	12	6	C. E. Vardell ..	1	1	0
				Sundry small donations ..	7	7	0
				Total	£105	17	0

Deceased Members.

The President said that since their last meeting they had lost the oldest member of the Association, *i.e.*, Mr. C. B. Arding, who joined the Architectural Association in 1848; and he moved a vote of condolence to the family of the deceased. The Association was represented at the funeral by the secretary, Mr. Driver. The vote was agreed to in silence, as also was a similar vote to the family of the late H. D. Aubrey, a promising member of the Evening school.

On the motion of Mr. H. Tanner, jun. (hon. secretary), a vote of thanks was accorded to Mr. Paul Waterhouse for kindly allowing a party of members to visit University Hospital Extension on the 11th inst.

Mr. Louis Ambler (hon. secretary) announced the donation of a reading-desk from Mr. Henry Tanner, jun. He also announced the following donations to the Library: "Estates Gazette" (6 vols.) and "Land Agents' Record" (12 vols.), presented by Mr. Sydney Perks; "Law of Easements," by T. T. Blyth, presented by the publishers (Sweet & Maxwell); "St. Louis Exhibition," by H. Phillips Fletcher, presented by Mr. B. T. Batsford; a photo of the A.A. excursion group, 1904, presented by Mr. W. Wonnacott. Thanks were accorded to the donors.

The President then read the Committee's nominations of officers for Session 1905-06, which was printed in our issue for March 18. He announced that Mr. Walter Cave had since been nominated as a Vice-President, and in those circumstances his name would be removed from the list of nominations for the Committee.

The Chairman said that the following gentlemen had been selected to act as scrutineers,

i.e., Messrs. T. W. Watkins, W. I. Travers, J. W. Denington, and M. S. Hack.

The Chairman also announced that a special general meeting will be held on Friday, April 7, at 7.15 p.m., to discuss the proposal to substitute the word "council" for "committee" wherever it occurs in the by-laws.

Sketch Plans and Working Drawings.

Mr. A. Needham Wilson then read the following paper:-

In asking an architect to read a paper on such a subject as this I venture to think a mistake has been made. The subject should have been dealt with in two separate papers and from the point of view of the persons most interested—Sketch Plans, by a Client, and Working Drawings, by a Builder—then I think we could have looked forward to a really interesting evening, for I take it that our committee had no intention of arranging for a dissertation on the mere history and development of draughtsmanship—which has been frequently done—but wished to consider the subject generally. Personally, I hardly think an architect best qualified to lay such a subject before architects, and any attempt at criticism would be altogether beside the mark. Though general broad rules govern our procedure in these matters, there is happily so much individuality shown by most practising architects that no one with the smallest sense of decency can well say, "So and so is the right way to prepare working drawings, and such and such is the wrong way." In an open meeting like this, too, it would be impossible to lay down rules for the guidance of students who are probably being taught better ones elsewhere—rules, too, which might be contradictory, and only lead to confusion. Given a proper basis upon which to work, I hold that it is better to allow every student to develop along the line of his individual fancy rather than he should be cramped by stereotyped methods or cut-and-dried ideas, and I fancy that this wise latitude is being reflected in what I may term the "broad-mindedness" which I think I can see in our architecture of to-day.

Therefore, I shall only attempt to deal with my subject on broad lines, and if I talk round it a little bit, and utter a few well-worn platitudes, at least I shall hope to avoid being dogmatic.

The practice of architecture involves many trials, many worries, and many anxieties; but one of its compensations certainly is in the preparation of sketch plans, and, perhaps in a lesser degree, working drawings. And yet even these have their drawbacks. When those first enthusiastic conceptions so brilliantly drawn come back to us mutilated beyond recognition, and we are bidden to carry out the building from the poor remains, then we feel this is a hollow world.

If we could not clothe the dry bones of commonplace ideas—other people's ideas and not ours—with some architectural flesh in the working drawings, we should find but cold comfort in the bald satisfaction of a client.

It is astonishing how great a sense of gratification may be derived from a good drawing. The dull routine work becomes interesting. Even a detail of a riveted girder can be made attractive in skilful hands. And we can redeem much that is dull and monotonous in our labour by the laudable pride evidenced in the attempt to do adequate justice to the architecture by the drawing. That is how I look at it. How the client looks at it is another matter. How the builder looks at it I soon find out, if my enthusiasm has led me astray from the path of working-drawing veracity.

The consideration of the means by which an architect translates his ideas and conceptions into hard matter-of-fact bricks and mortar must always be of interest to architects if not to anyone else. Working drawings scarcely appeal to the Man in the street. He can only judge the architect by his works as evidenced by actual buildings, and too often any appreciation is limited to their utility. Should such utility fit in with the usage of the Man in the street he rarely casts a thought to the process by which the building was evolved—scarcely to the building itself. To him it is sufficient that it is there, it grew spontaneously, or developed under the hands of the builder by some intuitive perception of the requirements of the Man in the street.

If he be a particularly well-informed Man, he will know that some architect has been employed, and if he casts a thought to him at all, it will be only to revile him. Occasionally the Man dabbles in building, and, becoming daring, talks to his nearest friend in an airy way about employing an architect, and in the tone that he

would of a strange order of beings of whom he has heard but with whom he has never come in contact. The friend is impressed, but warns the Man that he has heard that architects demand 5 per cent. for doing nothing at all, and he, becoming alarmed, straightway goes to a builder. How many outside our profession have the smallest conception of the process which must be gone through to enable the architect to erect his building? Even those who are best informed have an idea that an architect does nothing more than spend a pleasant hour or two occasionally in toying with a pencil and colours and producing pretty sketch plans which, when approved, are handed over to the clever builder, who turns the thing into a structural success. The ring of the trowel, the hammer's thud, the crisp sound of sawing are realities, something tangible, whereas the means by which the architect achieves his end are a silent, unseen force, and therefore unknown. The Man neither knows nor appreciates the concentration of thought, the focussing of years of hard work or arduous training that may be incorporated in the dashing sketch, the few clever lines or splashes of colour which show him his building as it is to be, or rather as the architect thinks it ought to be, furnished with ideal surroundings which do not exist and never will exist. It never strikes him that those slight sketch plans, in which everything is so perfectly arranged, are the result of much anxious thought and expenditure of midnight oil. He never dreams that the ingenious arrangements which fit together so well are integral parts of a harmonious whole, and probably induces in some cheapening economies which upset the balance of the architect's scheme. It is nothing to him that these features he wipes out so lightly have cost hours of patient labour and thought, and that the architect must again draw together his scheme and endeavour to cast over the mutilated remains the glamour of his individuality. But if this be so of the sketch plans, which he necessarily must see, what of the working drawings which he only sees when he signs the contract? I am not grumbling, or even sneaking with a sense of bitterness, unless it be the idea that we earn our money too easily. The preparation of preliminary sketches is his own compensation, and no architect worth the name begrudges the time or labour expended in expressing his ideal of the problem immediately before him; and reaps his reward in endeavouring to do it justice with pencil and compass. According to his success in translating it into matter-of-fact building, which is that which is increased, and his delight at success cannot be measured by pounds, shillings, and pence. Other people, even his professional brethren, may consider his effort a blot on the fair face of the earth, something to frighten intractable children with, but to him it remains a thing of joy, until he becomes discontented with it by doing something better. He is an artist for art's sake, he wishes to express the beautiful, and cannot be bound by sordid considerations of 5 per cent. The painter expresses his conceptions with his pigments and brushes on his canvases in the best manner he can, according to his artistic capabilities, and the architect similarly expresses his, but with different materials, each being actuated by the love of the beautiful. The one has completed his work, and appeals to a wide circle of admirers or critics. The other has not completed his work, and has appealed to an infinitely narrower circle, and must go through the procedure of working drawings, specification, quantities, details, superintendence, and settlement of accounts (to say nothing of "extras") before he can appeal to the public. The work of the painter enlists the sympathies of the public far more than the work of the architect, and the same public would little appreciate the article sketch merits of a set of drawings, even if "sketch plans." The expression of the painter's ideal on his canvases is fostered to a large degree. The expression of the architect's ideal upon paper is relegated to a little back room at the Royal Academy, probably to provide a secluded nook from the "madding crowd." The public will pay a shilling to see the painter's work, but they would not flock to see the architect's work, even if they were admitted free. And yet the architect plods on, taking his delight in his obscure "sketch plans," and sends his dashing sketch to his client, not wholly actuated by sordid motives in so doing, but anxious to express his ideal in as favourable a manner as he can for the very love of it.

What if he does idealise over much? What if he frames his building (on paper) in an imaginary setting? What if the skillfully laid-in mass of redundant foliage only exists on paper, and the lovely formal garden with yew hedges will yield to serpentine walks and a tennis lawn? That is the fault of the client who close the site, not of the architect who designed the building; and if the client is eventually disappointed because the actual structure looks so different from the clever sketch, well, it cannot be helped. The setting ought to have been there, that's all, and the architect has extracted a considerable amount of compensatory pleasure from his sketch, which he forthwith sends to the Royal Academy. I am afraid these sketches and sketch plans have a great deal to answer for.

I have even known them induce a client to spend more money than he originally intended. Unless this is artfully worked it leads to trouble, I believe. The client says to his friends, "Most expensive man, that architect fellow; made me spend far more than I wanted." Still, I am told it is surprising how a client may be led on by a judicious succession of sketch plans.

On the other hand, I am informed that "sketch plans" may lead a client to expect something that he does not get. Then he is dissatisfied, and feels defrauded. Also I gather that sketch plans occasionally lead to costly estimates and the abandonment of the work. Then the would-be client declines to pay for them, and the architect has to decide between a lawsuit and endeavouring to live on what pleasure he can extract from making beautiful drawings. This is what I am told, but I do not believe it. Indeed, I see sometimes from the papers that clients like the plans so much that they insist on keeping them. Some, indeed, claim a legal right to do so. Why, when they buy a picture, do they not claim the painter's colours and brushes? They are but the painter's tools, the means to an end, as are the architect's drawings. As the opposite to the man with a passion for architects' plans, I commend me to the man who does without plans, and who employs a builder to erect a *pot-pourri* of details sneaked from other buildings, and who pats himself on the back in appreciation of his cleverness in saving architect's fees.

The great advance that has been made in water-colour work is not the least striking sign of development in our profession. I can well remember the time when the power to turn out a water-colour sketch of real merit was in the hands of a few men of conspicuous ability. Other men who wanted that sort of work went to specialists. There were more men certainly who could produce able work in pen and ink, but the vast majority produced sketches which now strike us with amazement.

To-day, every man almost can handle a brush, and more often than not in a most creditable way, and the number of those who produce work of really artistic merit is largely on the increase. To this desirable state I think our Association has contributed to a marked degree, and recently I have been greatly struck by the manner in which a large number of our students have represented their designs, many of the sketches being of great merit, and indeed much better than the architecture. It used to be a complaint that the drawings on the walls at the Royal Academy were the work of specialists employed to give fictitious merit to the designs. The fictitious merit may still be there, but at least it is now most usually the work of the designers themselves. Personally, I am not one of those who think working drawings and details should cover the walls at the Royal Academy.

I think the buildings should be represented as they will appear when executed. Working drawings appeal only to the limited circle of the profession itself, whereas we wish to enlist the sympathy of an infinitely wider circle, not from a sordid point of view, but from an educational one.

As it is, the tasteful work exhibited attracts the public not at all, for as yet we have not succeeded in creating more than a languid interest in our work, which apart from our professional brethren, is only seen by our dutifully admiring friends and the man who thinks he is swindled of his shilling's worth unless he examines every exhibit in the place. Some years ago the editor of a well-known professional journal asked the question of many of our leading men, "Why did the exhibit attract so little interest?" One of the published answers was, "Because there are so few good architects." I do not think so

at all. The fault lies with the public, if it lies anywhere, and the necessity of placing our work before it as attractively as possible is bringing its own remedy.

It is natural, too, that the average client should wish to see how his building will look when completed, and from an actual point of view, and in its actual surroundings. He should not be expected to transform himself into a bird for the time being, or to view the building from the upper floor of an adjoining building. Elevations may be meaningless to him, however ably coloured.

I wonder how many architects take the trouble to sketch the actual setting for their building—so essential to the ultimate effect, but surely so very necessary to a harmonious whole? How often do we see a house which would be delightful if embowered in trees, but which looks distressing in the nakedness of a bare field?

I am only planning for a little more honesty in our sketch plans, which, I take it, include this very necessary "perspective view."

An architect is apt perhaps to represent his design under the most favourable conditions. He conceives it possibly so that it requires a blaze of sunshine to show it to advantage. But in this country we do not live under such weather conditions, and the conception may suffer materially when beheld under a grey sky and pouring rain. I do not suggest that he should present it before his client under such conditions. The result might have a damping effect; but I do suggest that the architect should consider such an effect on his design. These observations may be commonplace and trite to my more experienced brethren, but I would commend them to my younger fellow students as suggestions worth some consideration.

May I offer another hint?—which is this: Instead of preparing a fictitious perspective from the drawings, why should the architect not make an actual sketch—in whatever medium he prefers—from his executed building? A faithful drawing, without exaggeration, with all the blemishes strictly reproduced, and send that for exhibition or publication, as the case may be. You may say, Why not a photograph at once? I do not think so. It would not teach him nearly so much of the defects in his work, and he would lose all the pleasure to be obtained from such a sketch.

It will scarcely be denied that the art of the draughtsman has made enormous progress during the last twenty years or so. I was educated in an office where the traditions of the old "hair line" still lingered, and I can well remember the feelings of awe with which I contemplated the daring departures made by the leaders of the new school of draughtsmanship. The old method was suited to the architecture—very correct, but singularly tame and unattractive. Now, the poorest architecture can be made attractive—on paper—and the disappointment must be all the keener when the executed building comes to be displayed to public gaze. There will be few who will deny that a great advance has taken place in our architecture. Buildings of striking merit and individuality are springing up on every hand, and such violent oscillations as the Gothic Revival and the New Art have brought their inevitable reaction. Personally, I feel that the advance in our draughtsmanship has somewhat outstripped the advance in our architecture, and the rather coarse and dashing methods are apt to be reflected in the ultimate buildings. This has been forced upon my notice somewhat strongly of late in examining the work of our students, and I think I can detect a decided tendency to slur over the study of details. Careful consideration of parts is sacrificed to effect in the drawing, and the architecture is subordinated to a prettily-coloured sketch. I admit that this fault chiefly occurs in the cleverer or more brilliant designs, and that the sberber efforts are often distinguished by tamer methods. But I do suggest that there is a source of danger in the cult of the new draughtsmanship which, if pushed to extremes, may have disastrous effects. The application to actual practice may possibly be a restraining influence. An architect naturally wishes to exhibit his conception in the most attractive form to his client, and, moreover, his sketch plans are his idea of the appearance of the finished building, and everyone will agree that, so far, considerable latitude is not only legitimate but laudable.

But what shall be said when these methods are applied to working drawings? When the traditional manner of distinguishing materials

gives place to artistic colouring, and thick ink lines leave a considerable margin for conjecture on the part of the quantity surveyor or builder.

Only recently I heard of an instance where the skilful artist who prepared certain drawings contrived to tint some stonework so that the unlucky surveyor confidently took it as timber. And anyone who has seen a disconsolate foreman trying to scale with a 2-ft. rule from an 1-in. plan drawn by a modern draughtsman will readily understand that the architect must not be too particular to 3 in. or so. The moral is that the methods which are legitimate in the sketch plans require modification in the working drawings—no difficult matter in these days of sun prints. Probably the process by which careful and accurate working tracings are made from the sketch plans commends itself to many, and better preserves the spirit of the original conception than a translation into a series of carefully worked out pencil drawings prior to such tracing. I think it will be generally agreed that a surprising loss of original freshness and spice may occur when the first conception is filtered through a number of redrawings.

As I have said, in such a paper as this any attempt to lay down rules for others would savour of impertinence. Indeed, criticism would be out of place. Each man must necessarily use the means which he finds best suited to his purpose, and the mere observer who is ordered to read a paper on such a subject by an implacable committee can only comment; for between the man who supplies his builder with the slightest material in the shape of working drawings and the man who furnishes him with elaborate and fully figured and written-up drawings, lies such a wide field of experience and custom working towards the same end that any attempt to harmonise them would be futile. The one man expects his builder to enter into his mind and identify himself with the thoughts of which the drawings are only the expression—maybe an inadequate expression. Neither the builder nor the builder's men have been trained to this, and the question of success may largely depend upon how the architect can imbue them with his individuality, how fire them with his enthusiasm, how stamp his work with that indefinable something which cannot be expressed on paper. The other man, practical to his finger's ends, finds himself in conflict with a building financier and workmen trained in technical schools, and, in an honest attempt to combine art and practice, succeeds in imparting a certain hardness to his work which he finds displeasing and which he cannot understand.

I do not suppose there can be two opinions as to which of the two methods we should prefer, but, unhappily, until we train our workmen differently, and something of our old craftsmanship methods can be recovered, we are labouring under great disadvantages. It seems to me that two forces are operating at the moment—an artistic force and a technical force—and that they are operating on conflicting lines. Nor do I know that we are doing much to harmonise these forces. I think we should as a body have a far larger say in the training of our workmen, and turn the effort for technical instruction in the right direction. New constructional methods born of the technical schools are creeping into use, mainly, I think, where the architect ignores such points in his artistic working drawings; and personally, though desiring to be progressive, I have grave doubts whether these new methods are improvements on the old, and I am sure the actual workmanship is inferior. Do not many draughtsmen seem to fear that they will lose the beauty and interest of the design if the working drawings are elaborated? In detailing, no time is begrudged to the strictly architectural part, but too often, I suggest, the constructional niceties are left to the imagination. It is a hardship, perhaps, to imply that the little tricky methods and mannerisms which lend spice to a drawing should be abandoned, but are not many of them meretricious and meaningless, and confusing to the builder?

It is a sore temptation to give to one's working drawings the little deft touches which suggest that the hand of Time has already dealt kindly with the building as yet on paper only. Then, when it comes to be erected, the designer is disappointed at its stiffness and lack of interest. There must be some fault in the design that has to depend upon an appearance of premature old age for its beauty, and now, forsooth, we have architects who go to the length of applying these tricky methods to the actual building. The "cocked up" apex of a gable, caused by the

sagging of weak timbers, certainly adds piquancy to an old building, and one is tempted to exaggerate the tilt of a double tile verge on a drawing to soften the stiffness of straight lines. But the deliberate imitation of such effects by false construction appears to me to be bad in principle.

I know an unfinished house at this moment where the architect has not only suggested that his ridges have dropped a foot below the gables, but he has by artificial means given a wavy line to the main ridge, and a sagged appearance generally to portions of the roof. He might have built his walls out of plumb while he was about it, laid his floors out of level, and thrown in a few settlements. What is the effect? That of an interesting bit of architecture, with all the glamour of age to soften its angularities? Not at all. It suggests an ordinary bit of modern work, with an extremely ill-constructed roof. I only trust it may be condemned as a dangerous structure by the local surveyor. To my mind, such methods are a dragging of architecture in the mire, and totally unworthy of the high ideals we ought to sustain. But are they not the logical outcome of the new draughtsmanship, pushed to extremes?

I am not advocating in any sense a return to the old methods. I do not desire for a moment to return to the days of "hair" lines and stock colours of distressing rawness to indicate materials. I only advocate the keeping of the great development in draughtsmanship within legitimate limits without the aid of false and tricky methods.

The architect pictures his building in his mind. He conceives the effect which he wishes to produce, and conjures up a vision sometimes vividly clear, sometimes vague and shadowy, and in his sketch plans his endeavour is to realise that vision. To do so, any means almost are justifiable. He wants to judge of the effect of his windows in the balance of parts, and "patches" them in, and having secured the desired arrangement he adjusts them to his plan and modifies their appearance according to the manner in which they are glazed. He wants to see the effect of shadows and projections and scheme of colour, and to see it in its perspective aspect. He wants to set it in its surroundings and blend it with them, and the nearer he can hit off the ultimate appearance of his building the better for him and for his client. But should he produce something which cannot be realised through the medium of the working drawings, and cannot be faithfully reproduced in the finished building, what is at fault? Either his power of realising his vision or the means by which he does so. As I have tried to show, each man's individuality is necessarily reflected in his methods of draughtsmanship.

The "picturesque" man will draw picturesquely. The "cast-iron" man will produce cast-iron drawings. The academic school will proceed by academic methods, as we see exemplified by our French brethren.

Happily we are bound by no traditions. Each man roams "fancy free" over his paper, so to speak, and strikes out a vigorous line of his own, and as a result I venture to think we are producing domestic and ecclesiastical work second to none in the world in its variety and robustness—the first in its adaptability to the home life of our nation and the character of our country, and the second to the requirements of our religious life.

We fail, I think, in the one thing wherein academic methods would be advantageous—in our public buildings, to which we apply too often the "prettinesses" more appropriate to our domestic work. We are not an "official" race, and we cannot think officially, or stamp our public buildings with an official character. Our railway stations are a disgrace to a civilised nation, and, like too many edifices allotted to the public use, frankly utilitarian. Our French friends beat us handsomely with their official work, and, despite their academic training, without slavish adherence to classic prototypes.

We have not much to learn from them in the way of draughtsmanship, unless it be the scrupulous care with which their drawings are prepared. We might certainly gain something by an examination of their studies for carving. I well remember being shown some full-size working drawings for stone capitals by the late M. Henri Révoil, executed with the brush on dark-toned paper, the high lights being touched in in a white medium, and which for brilliance of execution beat anything I have ever seen. On the other hand, he was pleased to bestow unstinted praise upon my poor little pencil efforts, which,

he said, were so unlike the methods obtaining in his country. Please forgive the personal allusion in this incident, but it is the only case I can produce to show the effect of our methods upon our French friends.

It is only my own opinion, but I must say I feel our American brethren are considerably ahead of us in matters of draughtsmanship, in spite of their French training, and they have struck out on vigorous lines characteristic of their nation.

I have looked through some of the illustrated catalogues of their recent architectural exhibitions, and I confess to a little feeling of chagrin that our representatives make a comparatively poor show in matters of draughtsmanship. I may be wrong, and probably am, and you must please take my opinion for what it is worth. But if we are behind at all it will not be for long, for, having decided to change our conservative methods, we develop rapidly. Only let us beware that we do not rush into the opposite extreme. We want to breed architects, not draughtsmen merely, and must not neglect the study of our art for the sake of the drawing of it, for, after all, the drawings are only a means to an end.

I have seen many a working drawing most beautifully executed, exquisitely coloured, and I have envied the man who could produce such delightful architecture. It was not until I saw the actual executed work that I realised there was a something lacking. I could not tell why the executed work should not look as well as it did in the drawing. I have compared such drawings with the executed work line for line, and could only come to the conclusion that the clever draughtsman had cast a false glamour over the design which disappeared when materialised.

I wonder how many architects feel as contented with the executed work as with its delineation on paper, and yet, after all, the former is the ultimate goal, conceived in the mind, and its concrete form should satisfy that conception and not accord with the means by which it is brought to fruition.

Have not the exigencies of competition drawings largely led to this "falsification"? The temptation to attract the interest of the assessor by meretricious means is but natural. A design, meritorious in itself, sinks into insignificance in the company of others more cleverly manipulated, and delicacy of draughtsmanship is altogether killed by the bolder methods. This leads not only to competitive designing, but to competitive draughtsmanship also, and I suggest that its dangers, not only to architecture but to ordinary practice, are already apparent, and that the present generation of students are too apt to consider mere "telling" draughtsmanship the be-all and end-all of an architect's career.

I do not mean to depreciate for a moment the loving care and deep interest which any architect worthy of the name should put into his drawings. Any such man will always find himself wrapped up heart and soul in them, and the mere worthy rendering of the most commonplace construction will be a source of interest simply for the love of the work.

I only ask that we may be judged by our materialised work—a living, vitalised, educational force—rather than that we should appeal to the senses by the imperfect and traditional means by which we achieve our ends.

There would be an immense field before the man who could invent a method for registering our thoughts as the camera will register the desired view. It would save much distasteful routine work. We do not know what the science of the future may have in store for us, but it is to be hoped no *servant* will devise means for *thinking* a building into existence, for then we should lose much that delights and compensates in our sketch plans and working drawings.

I must not conclude these imperfect remarks without offering my heartiest thanks to those gentlemen who have so kindly lent drawings, I will not say to illustrate my paper, but to give an object lesson to those who hope to follow in their footsteps. It must be of great interest to us all to see the methods of other men, especially men whose work we admire, and I feel sure an intelligent examination of these drawings will point a lesson to our students present in a way that no remarks on such a subject can ever hope to do.

Mr. Walter Millard, in proposing a vote of thanks to Mr. Wilson for his entertaining lecture,

said that the subject had been treated on what the lecturer called broad lines. Personally, he should rather like to narrow it to the dimensions suitable to the junior student, for the subject was such a large one. He could not help thinking of those junior students who were engaged in doing little exercises called sketch designs—designs of imaginary buildings on imaginary sites according to imaginary conditions—and of what happened to those students when they came to the real thing, i.e., the making of working drawings. In doing that the student ran up against hard things, he wanted to know how thick he ought to draw his walls at the various heights; the next thing was as to footings and so on; and it was no use his being broad-minded until these points were all settled. He must be able to do a working drawing before he could be of real use in an architect's office. The beginner, generally, could not know even what size to draw things; he had a scale, but he did not know how much to mark off on the paper. And when he had settled the thickness of the walls, and knew a little about the Building Regulations, he had to find out about the floors, and he wanted to know the scantlings of the joists, or the sections of the steel work, the stonework, and things like that. He was, in short, a little bit at sea in doing a working drawing, and that was serious when someone had to make working drawings he gradually got some inkling of the profundity of his own ignorance. An engineer friend of the speaker's told him the other day his ideas as to working drawings. He asked his draughtsmen, "Have you, in making these drawings, put yourselves in the position of the contractor who has to work to them?" "Will he find in them all he needs and should expect to find?" That was a fair test of a good working drawing. The man who had always remained only in the office was liable to be "a little bit out of it" in providing drawings for those who had to do the work on the spot. That was an engineer's opinion of the standard as to working drawings, and it was not a bad one. They must produce working drawings that anyone could work from—drawings that the quantity surveyor and the builder's foreman could read and work from, and to do that involved a knowledge, and the ability to apply knowledge; it implied foresight, experience, and decision. It involved their knowing all about things in order to decide what ought to be done. The man who had acquired these qualities would not trouble about the different styles of drawing—about thick and thin lines. He would not waste his time in that way; he had got over that. His standard for a drawing was: "Is it workmanlike? Is it fit for the purpose?" Whatever may have been the case in the past, working drawings in our days were indispensable means of producing building work—the means, not the end. But they might be efficient or inefficient, means, according to the capacity and will of the draughtsman. He suggested to architectural students, as a modest aim of their ambition, that they should try to acquire the power and capacity to produce real working drawings, for unless they could they would never be of any real use to an architect. That really involved a tremendous lot, even for producing the mere carcasses of an ordinary building, and it was no slight accomplishment. So long as we could only produce sketch designs of a sort they would be of little use to an architect; less were they likely to become architects. The requirement of the power to produce a good working drawing was the junior student's main chance of escaping from the fog of the "non-knowledge" which surrounded him, the density of which would discourage him as he could realise it. The observation necessary to the making of a good working drawing, with help him to get a little knowledge, with knowledge would come a glimmering of light by which to grope through the rest; will and skill might do the rest. As to drawings of existing work, were they to be faithful or unfaithful records? What value were they to put on a partially faithful representation of work? An unfaithful drawing of existing work might quite easily be far worse than useless, as it would give information instead of the facts. Then there was a class of drawings which he would call incomplete drawings. He had had drawings put before him of a good piece of important work,

about which he had had to ask: What is it built of? The answer had been: "Oh! stone, but I do not like disfiguring my drawings with joining." Just fancy! A student of building-work not wanting to disfigure his precious drawings with evidences of construction! It mentioned that as a typical case which one met with frequently. Let the student play at making sketch-designs; they might have their use, but they certainly had their limitations of usefulness; but the sooner he set his mind to the real business of fitting himself to make working drawings, the sooner he would be of service to others and get on to the road of becoming an architect himself. It was his chief hope of professional salvation, which salvation he had to work out for himself.

Mr. Walter Cave, who seconded the vote of thanks, said that Mr. Needham Wilson seemed to attach too much importance to the value of the perspective sketch. Mr. Millard evidently felt the same when he spoke of the importance of the working drawing, and in speaking to students by far the most useful thing they could do was to teach them anything they could do as working drawings. The sketch-perspective was, in his opinion, of practically little value to the architect, except as affording some slight illustration of how things were to go; and it was most misleading to the client; for the actual building never looked as it did in the sketch, and the disappointment was general. A sketch of the site before a building was erected was too often forgotten, and he thought that a careful sketch of the site would help architects very much to determine the proportion of their buildings. The accuracy of drawings was of great importance. One often saw students' drawings of details in which it had been taken for granted that certain things were known which were not shown, and perhaps a plan of some portion was not shown. It was in such little matters that students often erred—and a good many draughtsmen, too. If the plan, section, and elevation were properly placed on the paper one ought not to have to search for them; they ought to appear quickly to the eye, so that one could read them. In the case of the foreman, this was especially important, for if he could not understand the plans, he had to spend hours in trying to do so and in writing letters, etc., and this entailed explanations and letters by the architect, all of which meant loss of time. The lecturer's statement that they wanted to breed architects, not draughtsmen, seemed to sum up the case pretty well; but at the same time architecture could not be produced nowadays without draughtsmen. Unlike the Middle Ages, there were very few intelligent building workmen in England to-day. In the Middle Ages, as they knew, buildings were produced by the workmen in many cases, and the working drawings which were used, so far as those remaining went to show—of Lincoln Cathedral, for instance—were the merest diagrams; practically little more than the setting out of the arches, where the piers were to come, etc.; the detail depended to a large extent on individual taste. If we attempted to do the same nowadays, architecture would cease to be even what it was. We had to do at the present time with a class of men whose education had been entirely neglected as far as art was concerned, and they had to be taught and trained, and this could be done, to some extent, by accurate drawings, which would enable them to see and appreciate the building as a whole.

Mr. Arnold Mitchell, in supporting the vote of thanks, said there was one point which had always struck him in the preparation of working drawings, and that was the importance of giving all the information it was possible to give quite regardless of the effect of the drawings themselves, and the importance of giving that information in the most simple, easily-read form possible. They must think of the builder as knowing nothing whatever of the scheme to be put before him, and they must think that if there were two ways of reading the plan there would be someone in the builder's office—not necessarily the builder—who would read it the wrong way; and therefore they must do all they could to make the drawings clear. Another thing they should do was to use small size sheets. Looking round the walls at the set of working drawings shown that evening he noticed that they were, generally speaking, all 14th scale drawings. Drawings on small size sheets were much more easily handled, and when they were passed from the architect's office to the quantity surveyor it was easier for the quantity surveyor to work from them.

Not only did he advise small size drawings, but he said, crowd all you can on to those drawings, and he said that for two reasons. First, it was easier to do this when work grew in an office, and it was astonishing how much work could be got on to an imperial sheet. In a corner of the room, he might mention, there were some three or four sheets of drawings on which work costing from 2,000*l.* to 3,000*l.*, including $\frac{1}{2}$ -in. detail, had been crowded on one imperial sheet. There was this advantage, too: when the drawing got into the quantity surveyor's hands they got one man to take off the quantities. The quantity surveyor often complained that all the detail was on one sheet, and that he could not divide the work. That was what he (the speaker) wanted, i.e., for one man to take the whole job from beginning to end, and where that was done the quantities were closer and the work was better done. In making working drawings they should figure them throughout. That was all-important. They might be badly drawn, as many of them were, but the draughtsman should figure every wall, every dimension, every window, and so on; to do this was invaluable, for troubles were avoided and any errors—as there constantly were in these matters—were much more easily corrected when the foreman went to check the figures. He had been much interested in what Mr. Needham Wilson had said as to the preparation of sketches for clients. The importance of this was at the beginning of a job. Mr. Wilson's suggestions under this head were very useful, and they tended to save a great deal of trouble, but he did not attach so much importance as the lecturer did to the value of elevation and perspective, more particularly perspective. He hardly ever prepared an elevation to submit to a client. He did not do so more than once in ten jobs, but he sent a little thumb-nail sketch, generally on a post-card. He found that that was an enormous saving of trouble, and that it generally satisfied the client. He commended to the student the knack—and it was only a knack—of sketching out from a plan. They were thinking of the roof of the building from the commencement—or should be—and after they had slightly sketched out the grouping of the building in pencil on the post-card they could then do it in ink. This was easily done, and it was all the client, in nine cases out of ten, wanted; in most cases they were delighted. A friend of his in the north had another method of dealing with sketch designs, which seemed a good one, though he, the speaker, had not tried it himself, but his friend did charming work. He prepared an eighth scale drawing, and above, in plasticine, he made a little model. The plan was done to a small scale, and the little model was done roughly in about a couple of hours. When it was dry he applied the colours. It sounded a long process, but the whole work did not take more than a day, and the client was delighted to have this opportunity of looking at the model of the structure.

Mr. Arthur Keen also supported the vote of thanks, and said he had made a great number of sketch drawings and working drawings in his time, and had come to regard them as necessary evils. With sketch drawings the architect was apt to deceive himself as well as the client, and he regarded the deception of the client as the lesser evil. Sketch drawings could not represent the building as it was going to be; but the perspective sketch was likely to give a best impression of what the client was going to get. It was easy to deceive oneself with sketch plans, and they were so easy to make that one could not be too careful to work accurately. Everything must be very fully, though roughly, drawn in the sketch drawings. He took it that the sketch plans should embody the whole of the building, but should omit things which were not essential at the moment, such as flues, etc., but they must show that the architect had realised the building for himself, and had realised it accurately. As to working drawings, he felt that a great risk was run of losing the character of their work, by reason of the great accuracy that was necessary in the preparation of working drawings. A working drawing, to be sufficient, must leave no room for suggestion at all. If they did not take the trouble to make all clear on the drawings they would have to answer all sorts of inquiries and letters, but in putting everything in the drawings they lost character and "go" in the design. The trouble

with assistants in offices was that they did not carry the drawings far enough; they took too much for granted, and were prepared to let the builder settle things for himself. In his experience they should leave nothing to the builder to settle.

Mr. John Murray said the subject seemed almost endless. No doubt what Mr. Wilson meant by treating the matter in a broad-minded way was that they should endeavour to get breadth of effect in all their work. The chief thing in most sketch and working drawings was accuracy, which was all-important, and there were many drawings prepared that were inaccurate. If they could remember that drawings and sketches were really the concentration of their thoughts depicted on paper their drawings, when finished, would be more satisfactory than they are sometimes. He felt that no sketch nor working drawing could be satisfactory unless the scale and proportion had received full consideration. Pretty sketches were very often made, and they were often misleading, especially when scale and proportion were absent from them. Perspective drawings had been known to vary from the plans, and it was quite possible to have a pretty perspective which was quite impossible if the plans were carried out. Mr. Wilson suggested that plans were hardly necessary, at exhibitions like the Royal Academy; but he (the speaker) thought that if plans were more often shown the credit that was sometimes given to perspectives would not be forthcoming. The sketch that depicted the main leading lines of a design was the one which was always the best and most satisfactory, and the grouping of the parts of a design should be always subservient to the outline. Too much was usually thought about detail and too little about outline and grouping of buildings. Colour sketches should show, as far as possible, the actual colour of the materials, otherwise clients would be deceived as well as the architect. As to the undefinable something referred to by Mr. Wilson, he thought that that consisted in the power of seeing in the mind's eye the finished building, and weighing up all the points in connexion with line, colour, and proportion. He felt that the best official work was done by producing monumental work. There was comparatively little real monumental work done nowadays, and he would suggest to the students that they should think monumentally, and if this were done they would produce in the future better architecture. Details of a design could be readily filled in after the general monumental conception had been settled. The most telling draughtsmanship was that which was the boldest, and the greatest pleasure an architect had was probably in the thinking out of a design rather than in the actual drawing of it.

Mr. H. P. G. Maule said that a good deal had been said about students' drawings, and he might say that a golden rule for quite a young student when he was preparing a sketch scheme was that he should first of all get out his scheme comparatively roughly, and then start doing a $\frac{1}{2}$ -in. detail. Let him determine exactly what he wanted to design, by threshing out his construction to $\frac{1}{2}$ -in. scale. The young student would not know what he wanted at first as to materials, but with $\frac{1}{2}$ -in. detail he almost immediately had to determine what materials to use for the different parts. As to working drawings, the one thing to remember was: Will the comparatively unformed builder's foreman interpret my ideas in timber, or stone, or whatever it may be? If they had that question constantly before them they got face to face with actualities, and the result was a great improvement in working drawings. He rather differed from Mr. Mitchell when he spoke about saving trouble. It seemed to him that the more trouble one took the less trouble one had.

The Chairman, in putting the vote of thanks, said he hardly understood what sketch designs meant. If they designed a house or anything else they had to make a plan and work the scheme out thoroughly, and if they did not do that he did not see how they could send a design to a client unless they ran the risk of getting into difficulty afterwards. They had to work out everything in the fullest way—all except the actual construction, so that they could make an estimate which was accurate enough to send to the client, and would not give them subsequent trouble. The preparation of working drawings was more or less a personal matter,

and he did not think they could lay down any hard-and-fast rules. As to working out the complete design at first, and crowding the drawings with dimensions, that was very well in one way, but it was seldom that one could design a building and not have to alter it as it progressed, and it was quite open to discussion whether the system of having the fullest drawings at first was the best.

The vote of thanks to Mr. Wilson, coupled with thanks to the various architects who had lent drawings, having been heartily agreed to, Mr. Wilson briefly replied. As to treating the subject on broad lines, he meant that he should treat it on those lines, but he did not wish to limit those who took part in the discussion to those lines. As to the President's remark that he hardly knew what sketch plans meant, he might say the same; the subject was given him, and he had to write about it. It was a difficult matter to draw an absolute line of demarcation. He was greatly indebted to those gentlemen who had lent him drawings, and he thought that only once before had such an interesting collection of working drawings been brought together as they saw that night.

The Chairman announced that the next meeting would be held on April 7, when a paper would be read by Mr. H. Phillips Fletcher on "The Buildings of the World's Fair at St. Louis, 1904," preceded by the special meeting at 7.15 p.m.

TWO SURREY PROPERTIES FOR SALE.

THE Manor House Estate at Merton has been placed in the market. King Henry I. gave the manor of Merton to the priory founded there in 1115 by Gilbert Norman, Sheriff of Surrey, for Austin Canons, who held it until the Suppression. Queen Mary I. granted the manor by letters patent of November 4, 1558, to the Carthusian monastery at Sheen, but soon after her sister's accession to the throne it again reverted to the Crown. King James I. bestowed it upon Thomas and Joyce Hunt to be held by fealty only, and not in chief, in March, 1610, and six years afterwards upon Thomas Ford, from whom it passed through various successions to the Dorries, and then in 1801 to John Hilbert of Wandsworth. The old manor house remained until the close of the XVIIIth century. Of the priory, which gave a name in 1236 to the "statutes of Merton," and possessed revenues amounting to 1,040*l.* per annum at the time of the Dissolution, some buildings survived until the middle of the XVIIIth century. The grounds extended over 60 acres, situated on the banks of the Wandie. At that time two calico-printing works had been established within the walls, the chapel being used as a print-room, and in the latter half of that century another portion of the site was occupied by the copper-flating mills of Messrs. Shears, of Bankside, Southwark.

Great Tangle Manor consists of 129 acres in the parish of Wonerish, near Guildford. King William I. gave it to Odo, Bishop of Bayeux, and it afterwards became the subject of various grants from the Crown. The manor house, of which a portion still stands, and is illustrated by Brayley and Britton, was built in 1582 by John Caryll, in whose descendants it continued during many generations. In 1782 Lord Granley pulled down part of the manor house and converted the remainder into a farmhouse. The timber-built residence, albeit modernised since, retains many of its former features, including the porch and hall, the overhanging stories and gables, the court enclosed with loop-holed stone walls, the most, gardens, and bathing and fish ponds. The figures "1582" appear in the carving of the oaken brackets which support the projecting front.

APPOINTMENT.—Mr. W. Douglas Wiles, who has been chief architectural assistant to the City Engineer of Norwich for the past eight or nine years, and who succeeded the late Mr. Clarke in that position, has been appointed County Surveyor and Architect of Denbigh, North Wales. The commencing salary is 650*l.* per annum. There were seventy-one applicants, and out of this number seven were selected to appear before the Council, viz.:—Messrs. T. W. Cubbon, Birkenhead; Arthur Davies, Town Hall, Manchester; A. Lancelotti Lang, Hounslow; G. Dickens Lewis, Shrewsbury; W. Vincent Morgan, Carmarthen; Walter Percival, Longton; and Walter Douglas Wiles, Norwich.

ELECTRIC HEATING.

WE had an opportunity last week of inspecting a novel system of electric heating which has been developed by the Electrical Corporation, Limited, of 69, Aldersgate-street, E.C. In most systems of electric heating the heat comes primarily by radiation from special electric lamps. These radiator lamps are constructed with thick filaments, and glow at a bright red heat when taking a quarter of a unit per hour. In the new system the heat is transmitted mainly by convection currents. Resistance coils wound on porcelain holders are placed inside a metal case, which is furnished with radiating tubes. The cold air enters the tubes at the base of the "Pluto" heaters, and the heated air is given off at the top outlets of the tubes. Thus a continual circulation of the air is kept up, and the appliance is both hygienic and economical. In our opinion, the great advantage of this type of heating is that the coils will practically never want renewing. Theoretically, the life of a radiator lamp ought to be very long, as it is merely a large glow lamp which is run at a low pressure; practically, however, they want renewing owing to accidents and rough usage. We do not agree with the inventors when they say that the drawback to the use of the "old-fashioned lamp radiator" is that it produces light, and so cannot be as efficient as a radiator which only produces heat. It is well known to physicists that in the case of the ordinary glow lamp the energy expended in producing light rays is only about 5 per cent. of the total energy consumed. In a radiator lamp it is much less than this, and, remembering that the visible rays heat quite as much as the invisible ones, it will be seen that this drawback is imaginary. It is stated that the consumption of one unit will raise the temperature of a thousand cubic feet of air 20 deg. C. in one hour. We think that in many cases it would heat a room more rapidly than this. After electric heaters have been running for about fifteen minutes, the amount of heat radiated or carried off by convection currents must depend only on the amount of energy consumed, and so experiments on the relative efficiency of heaters are entirely misleading unless due weight is given to the size of the room in which the test is carried out, etc. The amount of heat that can be obtained from one unit of electricity will raise two gallons of cold water to the boiling temperature, and every electric heating appliance has to get rid of this quantity of heat—no more and no less—per unit consumed, by conduction, convection, and radiation. The problem of converting a given quantity of electrical energy into heat, unlike the corresponding problem for light, is an exceedingly simple one. The difficulty arises as to the best way of distributing this heat. The "Pluto" heaters do this in a novel manner, and will prove useful in many cases.

THE REPAVING OF WATERLOO BRIDGE-ROAD.

THE following petition has been drawn up for presentation to the Lambeth Borough Council at their meeting on Thursday this week:—

"To the Mayor, Aldermen, and Councillors of Lambeth. We, the undersigned ratepayers and occupants of premises in Waterloo Bridge-road and adjacent thereto, have heard with extreme regret that your Council have decided to take up the wood paving and substitute granite setts in that road. We hereby respectfully submit our strong protest against that decision, and request the Council to reconsider the question, and to continue the use of wood paving.

Waterloo Bridge-road is one of the most important thoroughfares in the borough, and indeed in the Metropolis, and as such it deserves to be paved in the best possible way. It may be that a pavement of granite setts will last longer than one of wood, but in every other respect the advantage lies with the wood. If the existing wood pavement in Waterloo Bridge-road had been more efficiently and frequently cleansed and attended to, it would have continued in better condition, affording a better foothold for horses, and enduring for a longer period. We submit that the occupants in Waterloo Bridge-road are entitled to as quiet and as clean a pavement as is enjoyed by the occupants of other thoroughfares in the Borough of Lambeth. This consideration is of the greater importance inasmuch as the traffic on the road is certain to be largely increased, not only by the natural growth of London, but as a result of the opening, which will take place before long, of Kingsway, the new road leading from Holborn to Waterloo Bridge. Moreover, the adoption of motor traffic and the certain increase in the use of the motor car, many of which are already on the road, will be a cause of the greatest annoyance and inconvenience, and of injury to the welfare of the occupants and those who have the misfortune to live over the premises should such a noisy paving material as granite setts be laid down.

In other parts of London, and in nearly all the leading provincial cities and towns, the granite sett is being abandoned for the wood block. There can be no reason

why the borough of Lambeth alone should adopt a retrograde policy. We trust, therefore, that your Council will accede to our request, and relieve us from the grave injury which would ensue if a granite paving were laid down."

We certainly sympathise with the feelings of the petitioners on the question of noise, but it must be remembered that the choice of pavements is at present a kind of choice between one disadvantage and another. Granite is noisy; asphalt gives bad foothold for horses; wood has neither of these drawbacks, but it is insanitary. We do not know what is the motive of the Lambeth Council for proposing granite; but we do think that the noisy character of that pavement is a very serious nuisance in a street with large traffic.

THE SURVEYORS' INSTITUTION: RATING OF RAILWAYS.

AN ordinary fortnightly meeting of the Surveyors' Institution was held on Monday at No. 12, Great George-street, when Mr. F. Oliver Lyons, B.E., M.A., read a paper on "The Rating of Railways, their Over-taxation, its Cause, and its Remedy." He said his object was firstly, to show that the total rateable value of the railways of England and Wales exceeds the maximum limit apparently laid down in the Valuation Acts; secondly, to point out the legal anomaly which exists in connexion with the rating of railways; and thirdly, to suggest the remedy or remedies which must, he thought, necessarily be applied before the present state of affairs could be brought to an end. He advocated the cumulo principle of valuation as employed in Ireland, as against the parochial, and said that if, as he hoped to show, the adoption of this principle would cause the ratio of rateable value to net receipts to fall heavily on England and Wales, a great reduction of taxation would occur, without any injustice being done to other ratepayers.

In the course of subsequent remarks, he mentioned that the net receipts (excluding miscellaneous property) of the English and Welsh railways rose from 27,364,144*l.* in 1893 to 31,253,778*l.* in 1903, an increase of 3,889,634*l.* In order to earn this sum the railway companies as tenants had to supply the following additional rolling stock, viz., 3,781 engines, 8,089 carriages, 3,633 other vehicles, 97,204 wagons, and 6,285 other class of wagons, the total value of which in 1903 cannot have been less than 10,000,000*l.* Moreover, about 2,600 miles of single permanent way were added during that period.

The railway companies would not be in a position to form an absolutely definite opinion as to whether they would, or would not, benefit in each individual case by the adoption of the cumulo principle of valuation, until they carried out the two following suggestions, neither of which had ever been put into execution.

(1) The rateable value of each railway in every parish should be totted up, and the total actual rateable value of each line thus obtained.

(2) A cumulo valuation of each railway should be made in a fair and reasonable manner. It was evident that a definite and reliable opinion as to whether a railway was under or over assessed could not be given unless these two sums were known, and compared with each other.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

V.—SHIPPING OFFICES, COCKSPUR-STREET, NEW GOVERNMENT OFFICES, PARLIAMENT STREET.

TWO important buildings in course of construction afforded the members of the Architectural Association much interest and study both in design and in current building methods, upon the occasion of the fifth spring visit on March 25. The two subjects are both to be used as office premises, the one to be tenanted by Government departments, and the other by a combination of the principal American shipping companies.

The latter, Nos. 1 and 1A, Cockspur-street, occupying one of the most valuable West-end sites, covers an area of 4,720 ft. super. and has three frontages; that facing Pall Mall being 71 ft. 7 in., Cockspur-street 63 ft., and Pall Mall East 54 ft. 1 in. Mr. Tanner, jun., the architect, of the firm Messrs. Tanner, Jun., and Co., of 11, Abchurch-lane, was present, and supplemented the notes previously given to the visitors with this general information relating to the work. This is one of the important undertakings which are being constructed upon American lines in

London. The Waring-White Syndicate are the general contractors, and, although some American materials are employed, the work is sublet to various well-known English firms.

Mr. F. W. Nicholson, the organising manager, who has been responsible for the erection of many American "skyscrapers," put the plans and all detailed information as to processes at the disposal of the party. The whole building will be used for offices, the ground-floor and basement by the shipping companies, and the remainder let off to outside tenants, who will enter from Cocksputt-street.

The lease from the Crown stipulated that the new building was to be designed in keeping with the adjacent Union Club and the College of Physicians. This accounts for the presence and actual position of the large cornice which, to say the least, is an unfortunate element in a design which is not altogether good enough for the fine site. We fail to see any advantage to the architecture of London by imposing such restrictions. A main cornice should at all times be the crowning feature, but in this case it takes a position about half-way in the height, so that the superincumbent masses, which are here very much broken up, overpower the front. The idea of obtaining uniformity in the façades of this island site is a good one, but the mistake lies in the fact of leaving the various parts for buildings of diverse character.

Portland stone is used on the elevations, rising from an Aberdeen granite base. Internally the ground floor is panelled in walnut, and the flooring outside the counter laid with interlocking rubber tiling, a material now widely used in the United States.

The upper offices are furnished with Honduras mahogany. Asbestos plastering is used throughout. The principal staircase is arranged independently of the east party wall, and is carried by four stanchions placed in the corners of the well, which well contains a passenger elevator. A luggage lift is also provided for following travellers' baggage to the basement.

It is intended to open the premises for business on May 1 next; the actual building operations will then have taken eight months, which, considering that there is so much architecture and solid walls in the scheme, is very rapid construction.

It is an excellent illustration of American methods applied to a British design.

At the new Government offices at the south end of Parliament-street much was seen of very considerable interest, and the architectural treatment could be regarded with entire satisfaction. Three-fifths of the whole scheme, which is the extent of the present operations, is now well on towards the height of the main cornice, and gives promise of a great work.

The large circular court* is especially fine, and the stone vaulted loggia entrance from Charles-street, arranged on the axis of the entrances to the adjoining Foreign Office, has great dignity. Equally satisfactory results may be anticipated in the interior of the building, and it is generally evident that the architect was a master of proportion.

In general respects there is but slight variation from the original design, which the late J. M. Brydon had completed before the profession mourned his loss. We gave plans and views on our issue of March 25, 1899, from which the chief departures are of a practical working nature. The principal variation consists of containing the original small parts of the top floor round the whole of the building, but this does not affect the elevations as first designed.

Portland stone is again the material used on the façades, and the general internal construction is as fireproof as possible. In this respect some wrought-iron ribs to receive metal lathing and plastering in the barrel-vaulted corridors received much favourable comment.

The work of Messrs. Spencer, Santo, & Co., the contractors, is in every way admirable. The members were indebted to Mr. Allison, representing Sir Henry Tanner, architect to the Office of Works, for a very lucid explanation and description of all matters concerning the construction of this large undertaking.

NEW THEATRE, ABERDEEN.—Messrs. Brown, Park, & Co. ask us to mention that they were the contractors for all the steel-work for this theatre, which was briefly described in our last issue.

* See the Builder, May 5, 1900.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. E. A. Cornwall, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend Battersea Borough Council 7,366*l.* for electric lighting purposes; Bermondsey Borough Council 13,270*l.* for paving and sewer-works; St. Pancras Borough Council 5,370*l.* for electric light installation and meters; and Wandsworth Borough Council 800*l.* for underground convenience and 2,765*l.* for sewer works.

Storm Floodings.—Pumping-station in Battersea.—The Main Drainage Committee reported, and it was agreed to after discussion, and after a motion to refer the matter back in order that tenders might be obtained had been defeated:—

"That the estimate of 20,000*l.* submitted by the Finance Committee be approved; that expenditure not exceeding 18,746*l.* be sanctioned in connection with the construction of section No. 1 of the proposed pumping-station at the junction of York-road and Creek-street, Battersea; that the work be carried out without the intervention of a contractor; and that the drawings, specification, and estimate of 18,745*l.* be referred to the Works Committee for that purpose."

The Apprenticeship System.—The Education Committee, in the course of a report in which recommendations were made as to certain technical or industrial scholarships, stated that there was a general opinion that the best system of preparation for the skilled handicrafts was, as regards boys, by means of the old-fashioned apprenticeship, and they proposed carefully to consider how far the powers of the Council and the modern industrial conditions of London trades would enable any suitable modification of that system to be made use of. In most London industries, however, the old system of apprenticeship had fallen into desuetude, and the Committee did not think that the Council should abandon its present system of technical or industrial scholarships in the meantime. The present proposals were merely temporary in character, in order to avoid a breach of continuity. The total increase of expenditure involved was about 2,800*l.* a year, but this would not be reached for five years.

The recommendations of the Committee were adopted.

Widening Fleet-street.—On the recommendation of the Improvements Committee the Council agreed to bear half the cost, namely, 7,750*l.*, towards widening Fleet-street by setting back the frontages of Nos. 53, 68, and 69.

Victoria Embankment Gardens.—Lighting by Electricity the Villiers-street Section.—The following recommendation of the Finance Committee was taken back after discussion as to the desirability of the scheme, and the appropriateness of the design:—

(a) That the estimate of 1,000*l.* submitted by the Finance Committee be approved; that expenditure not exceeding that amount be authorised for lighting by electricity the Villiers-street section of the Victoria Embankment Gardens; that any necessary tenders be invited and contracts entered into.

(b) That the tender of Messrs. W. Letherson & Sons, to supply and erect for 330*l.* twelve wrought-iron arches in accordance with the design submitted to the Parks and Open Spaces Committee be accepted.

The Committee reported as follows:—

"In view of the desirability of securing that the design of the arches should be of a highly artistic character, we have had drawings for the same prepared by Mr. H. A. Prothero, M.A., F.R.I.B.A. After due consideration we obtained a tender for the supply and erection of twelve such arches from Messrs. Letherson & Sons, of Cheltenham, who, we were advised, had had considerable experience of work of this description. We propose in due course to invite tenders for the work of laying the necessary drains and the wiring and fitting of the electric lamps and shades. Where the mains will be under the surface of grass areas the trenches will be dug and the surface restored by the park staff, as this will be the most economical method of doing the work."

London Building Acts (Amendment) Bill, 1905.

—The Parliamentary Committee brought up a report also to the London Building Acts (Amendment) Bill, as follows:—

"We report that, as the result of a compromise arrived at on March 14, 1905, at the House of Commons, between the members of Parliament in charge of the London Building Acts (Amendment) Bill, and of the City of London (Escape from Fire) Bill, and other opponents of the Council's Bill, it was agreed to drop all parts of the Council's Bill with the exception of Part VIII. (Means of Escape from Fire). We are satisfied that there was no possible chance of the Bill passing second reading as it stood, and that, therefore, as the whole of the Bill would have most probably been rejected, the course taken was, in the circumstances, the best which could have been followed. It would, in our opinion, have been regrettable if, because the Council was unable to pass the whole Bill this year, it had therefore declined to avail itself of the opportunity of placing before the Committee of the House its proposed amendments of the law as to means of escape from fire. As a result of the compromise, so

much of the Council's Bill as deals with the means of escape from fire, and the City Bill, will be referred to the same Select Committee for consideration."

The Public Health Committee also brought up a report on the subject, in which they mentioned that:—

"The Council's Bill contained provisions as to the open space about buildings; the height of buildings; the lighting of staircases; the height, lighting, and ventilation of habitable rooms; and the making of by-laws respecting buildings on sites which are damp or have been heavily manured; as well as other provisions of importance to the public health; and we are of the opinion that an early opportunity should be taken to promote legislation dealing with these subjects."

The Highways Committee reported as follows on the subject:—

"We have had under consideration the question of the effect upon the Council's tramways work of the omission, among other clauses, from the London Building Acts (Amendment) Bill of the present session, of those relating to the cubical extent of buildings, and the widening of thoroughfares upon the payment of compensation. The former question is of great importance in regard to the erection of buildings for dealing with the operation of a large electrical tramways system, while the other clauses, with regard to which we understand that the Improvement Committee are specially reporting to the Council, would, we feel, have been of the utmost use in enabling the Council to develop more rapidly the locomotion system of London. We hope that these proposals will be again put forward in the session of 1906."

The report of the Improvements Committee contained the following paragraphs:—

"The Bill contained clauses (Nos. 18, 31, 32, and 176) to enable a local authority to pave and to add to the foot pavement any open forecourt which might be left between a building and the carriage-way; to enable the Council to determine a building-line on one or both sides of any important street at a distance not exceeding 75 ft. from the centre of the street; to acquire any buildings, land, or structures in advance of the line so determined, or to require any such buildings or structures to be set back to such line on payment of compensation; to provide that after the determination by the Council of such a building-line no building or structure shall, without the consent of the Council, be erected or extended in advance thereof; to enable the Council to make new streets where necessary to continue a thoroughfare widened as aforesaid, or for the purpose of affording thorough communication; to enable the Council to remove barriers, etc., between one street and another; and to provide for the settlement of questions of compensation and for the necessary machinery to enable the Council to exercise the powers sought to be obtained."

We are of opinion that these clauses, if sanctioned by Parliament, would have conferred upon the Council very necessary and desirable powers in respect of street improvements, particularly in connexion with the widening of thoroughfares in which there are or may be tramways. We have on several occasions advised that further powers should be sought by the Council with the view of enabling street improvements to be undertaken more expeditiously and at less cost than is at present the case. We regret the circumstances which made it necessary for the clauses to be dropped, and we desire to express the hope that it may be possible to submit to Parliament in the session of 1906 a Bill containing clauses similar to those referred to above."

The Building Act Committee reported as follows on the subject:—

"In view of the course taken with regard to the London Building Acts (Amendment) Bill and the City of London (Escape from Fire) Bill we think it our duty to point out that on January 31, 1905, the Council decided to seal and present, if necessary, a petition against the City of London Bill, and on February 3, 1905, we informed the Parliamentary Committee of the grounds on which we thought the Bill should be opposed. With regard to the London Building Acts (Amendment) Bill, the Council decided on November 15, 1904, to put forward in the present session of Parliament the whole of the amendments suggested by us, a resolution to refer the proposed amendments back for further consideration with a view to legislation being sought in the session of 1906, being defeated by seventy-five votes to twenty-seven. The work of many other committees of the Council is involved in the portion of the Bill not to be proceeded with in this session of Parliament, and some of the proposed amendments, especially those which would directly affect the public health, are as important as those in Part VIII, which has been referred to a committee of the House. We purpose reporting as soon as possible as to the course which we think should be followed with regard to the portion of the Bill which has been withdrawn. In the meantime it is probable that some modifications will be suggested in committee in the provisions of Part VIII of the Bill, and we recommend that the Parliamentary Committee do confer with the Building Act Committee as far as possible with regard to any further proposed modifications of the London Building Acts (Amendment) Bill."

Mr. Lewin Sharp moved, and Mr. E. Smith seconded, that the Fire Brigade Committee be included.

This was agreed to.

Captain Hemphill, Chairman of the Building Act Committee, complained of the high-handed proceedings of the Parliamentary Committee in emasculating the Bill without consulting his committee.

Mr. H. P. Harris said that they all felt that some amendment of the Building Act was desirable, but that the matter should be dealt with in some tact and discretion.

Mr. Howell J. Williams said that among builders and professional men there was a consensus of opinion that no amendment of the Building Act was required, but a wholesale revision—a codification. The recent Bill met

don and supported the vote of thanks, viz.:—
Messrs. A. H. Belcher, T. H. Russell, Frank Lishman, Stanley Towse, and the Chairman.

The Chairman then called upon Professor Simpson, of University College, to sum up the discussion. The Professor said he was sorry that he had not been able to read the paper before coming to the meeting, as he would have liked to have had an opportunity of doing so. He congratulated the author on the conciseness of his lecture, which he would summarise under the headings (a) Provision of a museum, (b) Testing of materials, and (c) The data obtained from testing and inquiries. The Professor thought the museum should be built in a central and easily accessible position. The expenses of efficiently testing materials would be heavy and somewhat difficult for such an institution as that suggested, but the classification and standardising of building materials and the collecting of all possible information concerning them would prove of the greatest value to all concerned. He thought great credit was due to Mr. Munby for putting forward the subject in such a practical manner, and hoped that any difficulties encountered in carrying out the scheme would not deter its coming into effective use. The paper brought before them very clearly the great changes that had taken place in recent years.

The vote of thanks to Mr. Munby for his paper, and to Professor Simpson for so kindly attending as Special Visitor, was put to the meeting and passed with acclamation.

Mr. Munby then briefly replied, thanking the members for hearing him so patiently, and mentioned that this was the first occasion on which his ideas of a scheme for establishing "an information bureau on the products of the building trade" had been placed before a public meeting.

ARCHITECTURAL SOCIETIES.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—At the rooms of this Society on the 23rd ult., Mr. Percy S. Worthington, of Manchester, read a paper on "Past Tradition and Modern Design"; Mr. G. B. Bulmer, President, in the chair. The lecturer said that when their Hon. Secretary invited him to read a paper before them, it had occurred to him that, as they already had a number of historical papers on their list, they might care to discuss some phase of the educational problem, and that of the relationship of theoretical study to actual practice in design might be interesting. In taking stock of the architectural position of to-day, the difference readily occurred to us between the conscious effort after design and the arbitrary choice of styles, in other words, individualism as opposed to national co-operation in design. We acknowledged how much was owed to tradition in the past, and asked ourselves how we might make the best use of our inheritance. We had heard a great deal lately about national degeneration, both mentally and physically, and one of the remedies most generally suggested was education. In our professional education we were certainly behind that of some other countries. Theoretically our haphazard system (or want of it) should be fatal to any excellence of the art. Practically he did not think we are in such a bad way. In fact, one was inclined to think that the work now being done was equal to, if not better than, the average work of any other country, France perhaps excepted. The student or apprentice of the XVth, XVIth, and XVIIth centuries was trained in the three arts of sculpture, painting, and architecture, and in after life practised all three. Buildings were books, then as now, and their measurement formed the self-education of the architect, whether he did it as Peruzzi did, with an eye to the composition of his architectural backgrounds, or as Brunelleschi did, with the definite idea of constructing his dome at Florence. With us in England it was different, but we could hardly afford to ignore their experience, and we might take it as an axiom that for the intelligent study and practice of design a knowledge of the history and architecture of past times generally was essential. Taste might be acquired to a degree by education and experiment without being informed, and they were within the reach of us. As an example of trying experiments with antiquity one might cite that fine and distinguished work, the new Westminster Cathedral. With regard to planning, certain types of plans were still more or less traditional, that, for instance, of places of public worship,

though even here one saw no reason why some modern type might not be evolved which might appeal to religious instincts as much as the old type.—At the same meeting the following were elected officers for the ensuing session:—President, Mr. G. B. Bulmer; Vice-Presidents, Messrs. H. S. Cleverly and R. A. Smithson; Hon. Secretary, Mr. R. P. Oglesby; Hon. Treasurer, Mr. W. H. Thorp; Hon. Librarian, Mr. G. F. Bowman; Council, Messrs. R. Marshall, F. Musto, A. J. Hill, H. A. Chapman, P. Robinson, and G. E. Reason.

LIVERPOOL ARCHITECTURAL SOCIETY.—Mr. Frank Rimmington read before a meeting of this Society, held at the Law Library, on the 20th ult., a paper on "Small Houses of To-day." He threw out a number of practical suggestions for the guidance of young architects in designing and planning suburban houses with a view of combining economy with the features of repose in external aspect, harmony in relation to surroundings, and the impression of home-like hospitality in the internal arrangements. Among other things he urged a preference for local material where suitable, and an avoidance of "original" ideas when not necessary to overcome a difficulty. He considered also that woodwork might be treated decoratively and inexpensively to a greater extent than was now the practice, and that sham effects ought to be avoided. There was much talk nowadays about the housing of the working-classes. The housing of the middle-classes was also a large problem. As it was the middle-class had to live in suburban streets of houses all of one type, where no attempt was made to meet the varying requirements of families. Architects could do much to foster the building of individual houses of an economical type, without lending themselves to the misleading notions sometimes put into print that this could be done at little or no cost.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—A meeting of this Society was held, on the 23rd ult., in the Society's room, Leopold-street, Mr. T. Winder presiding. A lecture was delivered by Mr. W. J. Hale on the "Rectilinear" Period of Gothic Architecture. The lecturer commenced by defining the period of rectilinear architecture as extending from the year 1360 to 1547, that is, from the latter part of the reign of Edward III. to the close of the reign of Henry VIII. He gave a short summary of the history and condition of the country, and remarked that the period included the French wars and the loss of practically all French possessions, the Wars of the Roses in England, and the gradual increase of the power of the commons. Also such important events as the introduction of printing, the translation of the Bible, and the discovery of America occurred within its limits. It was pointed out that the gradual improvement of building methods, and the greater appreciation and application of scientific knowledge, assisted the development of architecture and influenced the plan of the building. The lecturer questioned the statement that the geometric period was the summit of Gothic art, and that architecture declined after the XIIIth century; he contended that Ruskin's argument concerning tracery was not convincing, as the assumption from which he started was not warranted by the actual facts. The skeleton forms on which the rectilinear tracery was based were shown by diagrams, and it was argued that the introduction of a vertical line into the window head was a natural step, which tied the composition of the whole window together in a logical manner; and it was claimed that this method fulfilled Ruskin's aphorism, "Tracery must not be considered or imagined as flexible." With further diagrams the development of vaulting was traced from the rib to the true fan vault, which is peculiar to the period and to England, and the method of construction and the principle of its stability were explained. It was also contended that although in fan vaulting the rib and the panel were not separate, the method was truly constructional, and that the sinking of panels in the stone, with the ribs emphasising the lines of resistance, was a correct method of reducing the weight and ornamenting the surface. Attention was called to the influence of the chamfer plane on the form of the mouldings, common to the period, and allusion was made to the tapering outline which was produced by the repeated set-back of the buttresses, particularly those to towers, which gave a feeling of repose and stability. Other points of detail were noticed, and the importance of considering a design as a whole, rather than as a

number of individual parts, was insisted on. Mr. Hale reminded the students that architecture meant sacrifice; if they wanted their work to be successful it must be done for its own sake. Real, living, architecture never could be produced so long as mere monetary gain was the main object of the designer. He concluded by quoting the definition of architecture which Ruskin gives in his "Lamp of Sacrifice," "Architecture is the art which so disposes and adorns the edifices raised by man, for whatsoever uses, that the sight of them may contribute to his mental health, power, and pleasure." The lecture was illustrated by a series of lantern slides. On the motion of Mr. Mitchell-Withers, seconded by Mr. H. L. Paterson, and supported by Messrs. J. M. Jenkinson and J. R. Wigfull, a hearty vote of thanks was accorded Mr. Hale for his lecture. The lantern slides were exhibited by Mr. Atkinson, of University College.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The Edinburgh Architectural Association visited Inveresk on Saturday, last week, under the leadership of Mr. Thomas Ross, F.S.A. (Scott.). Among those present were:—Mr. H. O. Tarbolton, F.R.I.B.A., President; Mr. J. T. Baillie, Vice-President; Mr. Colin B. Cownie, Hon. Secretary; Mr. Hunter Crawford, ex-President; and over forty members. The places inspected were the old bridge over the Esk, the church and churchyard, Inveresk House, Inveresk Lodge, and Halkerston Lodge. Particular note was taken of the Roman remains in Inveresk House grounds, and the leader of the party declared that, if the proprietors of the villa houses in Inveresk were to unite, they might, at very little expense, conduct some excavations on a very complete plan, and might make out the Roman town of Musselburgh so that people would be enabled to form a better idea of the importance of the place in Roman times, an importance which at present was not at all understood.

LONDON BUILDING ACT, 1894:

TRIBUNAL OF APPEAL CASE.

The Tribunal of Appeal, under the London Building Act, 1894, sat at the Surveyors' Institution, Great George-street, S.W., on Tuesday, to hear an appeal by Messrs. Mackrell, Maton, & Co., on behalf of Messrs. Chessum & Sons, against the certificate of the Superintending Architect of Metropolitan Buildings, dated February 22, under sections 22 and 29 of the Act, defining the general line of buildings on the northern side of Monier-road, Bow, between Wick-lane and Smeed-road.

The members of the Tribunal sitting were Messrs. J. W. Penfold (Chairman), A. A. Hudson, and E. A. Graining.

Mr. H. C. Biron, barrister, appeared for the appellants, and Mr. Andrews, from the Solicitors' Department of the London County Council, for the respondents.

The appellants are the freeholders of the land and building in Monier-road, which is upward of half a mile in length. With the exception of the small piece of land belonging to Messrs. Chessum, all the land fronting the road on both sides has been built over long since. In 1903 the appellants were desirous of building a house suitable for the residence of workmen on the site, and instructed their surveyor, Mr. T. Wilson, to prepare plans. On visiting the site Mr. Wilson found that, with two exceptions, all houses in the road which stood at the corners of intersecting roads had been built up to the pavement line. On the opposite side of the road all the houses for a considerable distance down the road are built to the pavement line. The road at this point is a 40-ft. road, and plans were prepared for the building to be erected up to the pavement line. The building was commenced in June, 1904, and considerable progress had been made before September 29, when the solicitor to the London County Council wrote objecting that the building had been erected beyond the general line of frontage. An application was then made to build in advance, but was refused. The Superintending Architect then defined the line, but Mr. Wilson raised the objection that the Superintending Architect had not before him a plan of the whole road, showing the corner houses all the way down the road, except two built up to the pavement line, and protested against such a definition. Messrs. Chessum, therefore, appealed against the certificate, contending that the general line should be defined up to the pavement line.

The Tribunal, after hearing the appellants' case, came to the conclusion that the certificate of the Superintending Architect could not be upset. They, therefore, dismissed the appeal, with five guineas costs. They did not

call upon Mr. Andrews, but expressed a hope that he would convey to the London County Council their view that the building, as erected by the appellants, should be allowed to remain, inasmuch as, in their opinion, its position did not involve any injustice to the public.

Fifty Years Ago.

MASTERS AND MEN.—NOTICE TO LEAVE WORK.—An important case was heard in the Sheriff's Court on Saturday, March 17, in which two workmen, G. Trollope and J. Griffiths, carpenters, were the plaintiffs, who sought to recover a quarter of a day's pay, according to the usual custom of the trade, viz., a quarter of a day's notice or a quarter of a day's pay. The plaintiffs said they had been at work about eighteen weeks, in the employ of Messrs. Brass & Son, builders, at the London and South-Western Railway, and were discharged on Saturday at four o'clock without any notice, which being contrary to the usual custom of the trade, they summoned Mr. Brass for a quarter of a day's pay. The defendant stated that about two years ago he decided on not giving his workmen any notice whatever on being discharged from his employ; and also stated that as he paid his men up to half-past five o'clock on Saturday he ought not to give notice. The plaintiffs urged that that had nothing to do with the case, as leaving off at four o'clock on all Saturdays constituted a day, and was acknowledged by the trade in general, and they considered they should receive a quarter of a day's notice before four o'clock, or a quarter of a day's

pay, as it was essentially necessary that they should have time to put their tools in order, as they are expected to have them so when they go to work for any employer. The Judge agreed with the plaintiffs that they ought to have received the usual notice, and gave judgment for the plaintiffs, with costs. — *The Builder*, March 31, 1855.

Illustrations.

CANTERBURY CATHEDRAL.



HIS view, showing a portion of Canterbury Cathedral from a south-west position, is another of the drawings executed by Mr. J. B. Fulton as a holder of the Travelling Studentship of the Royal Academy.

It gives an effective view of the central tower, which is now undergoing repair. The drawing shows part of the late (and much restored) nave, and in the distance is seen a portion of the picturesque Norman turret of the east transept.

ANCIENT BUILDINGS AT FAMAGUSTA, CYPRUS.

THESE illustrations are from photographs lent by Mr. B. Stewart, who is well acquainted with the locality, and has photographed a good many of the monuments there. In reference to these illustrations, Mr. Stewart writes:—

"Famagusta was first built by Ptolemy Philadelphus (B.C. 285–247), when it was known as Arsinoe. The Franks gave it its

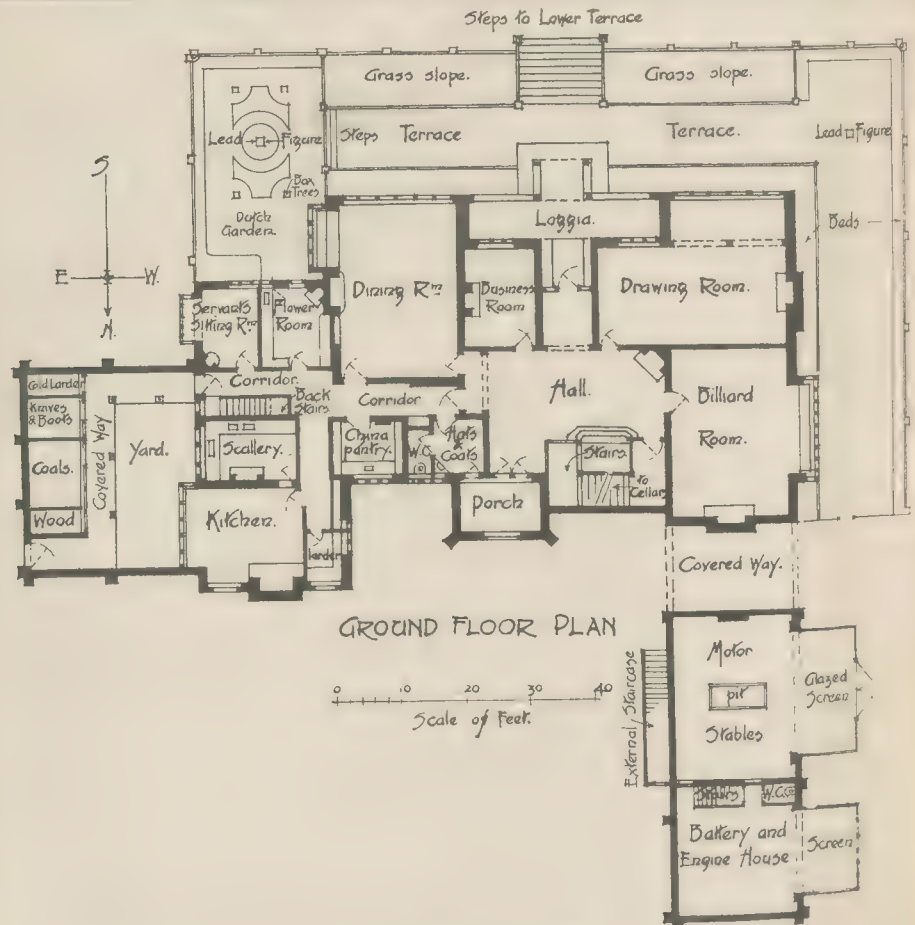
present name of Famagusta, and it was fortified in 1300 by Henry II. and was seized by the Genoese in 1373. The Venetians took it in 1489, and between 1498 and 1544 the fortifications were completed much as they appear to-day. The Cathedral of San Sophia was built 1300–1312 as a Latin church, and then dedicated to St. Nicolas. When the Turks took Famagusta from the Venetians in 1570, they turned the church into a mosque and gave it its present name. The tracery of the west front and particularly the west window is very fine, and owing to the very dry climate is in a wonderful state of preservation. The glass in this window is quite modern, and is the only one with glass in it. The church of SS. Peter and Paul is in the best state of preservation, being further removed from the effects of the Turkish bombardment than most of the other churches, though earthquakes have assisted to complete its destruction. Traces of frescoes which once enriched its interior can still be seen, as also at some of the other churches.

Famagusta is now a desert dotted all over with the ruins of grand buildings, a melancholy though picturesque wreck of its former grandeur."

GREAT HOUSE COURT, EAST GRINSTEAD.

THIS house has been erected for Mr. Geo. Peploe Forwood. It is beautifully situated on the outskirts of the town, with lovely views over Ashdown Forest.

The materials used were old Horsham stone tiles and old red roofing tiles for the roofs, the facing were bricks brought from Petersfield.



Great House Court. Plan.

Hairs; black flints squared were also introduced. Old oak beams formed the framing of the staircase gable, averaging in thickness 8 in. by 4½ in., the whole of the woodwork being pinned and framed together in the old way. The walls were 16 in. throughout.

A feature in the house was the introduction of Sussex marble stone to the open fireplaces and in place of window boards to some of the windows, this stone being obtained from the property of another client.

The hall, staircase, and first floor were panelled in oak; this, with the staircase newels, treads, and balusters, was formed almost entirely from the centre post, bearing date 1730, of an old mill which stood just outside the town.

Mr. A. W. Selater, of Oxford-street, was responsible for the electric lighting, fittings, and plant. The iron casements and lead glazing were provided by Mr. J. Jennings, of Clapham-road, London; the heating by Messrs. John Grundy, of Islington. Mr. Rice, of East Grinstead,

was the builder. The architect was Mr. Turner Powell, of London and East Grinstead.

NEW STOCK EXCHANGE, JOHANNESBURG, S.A.

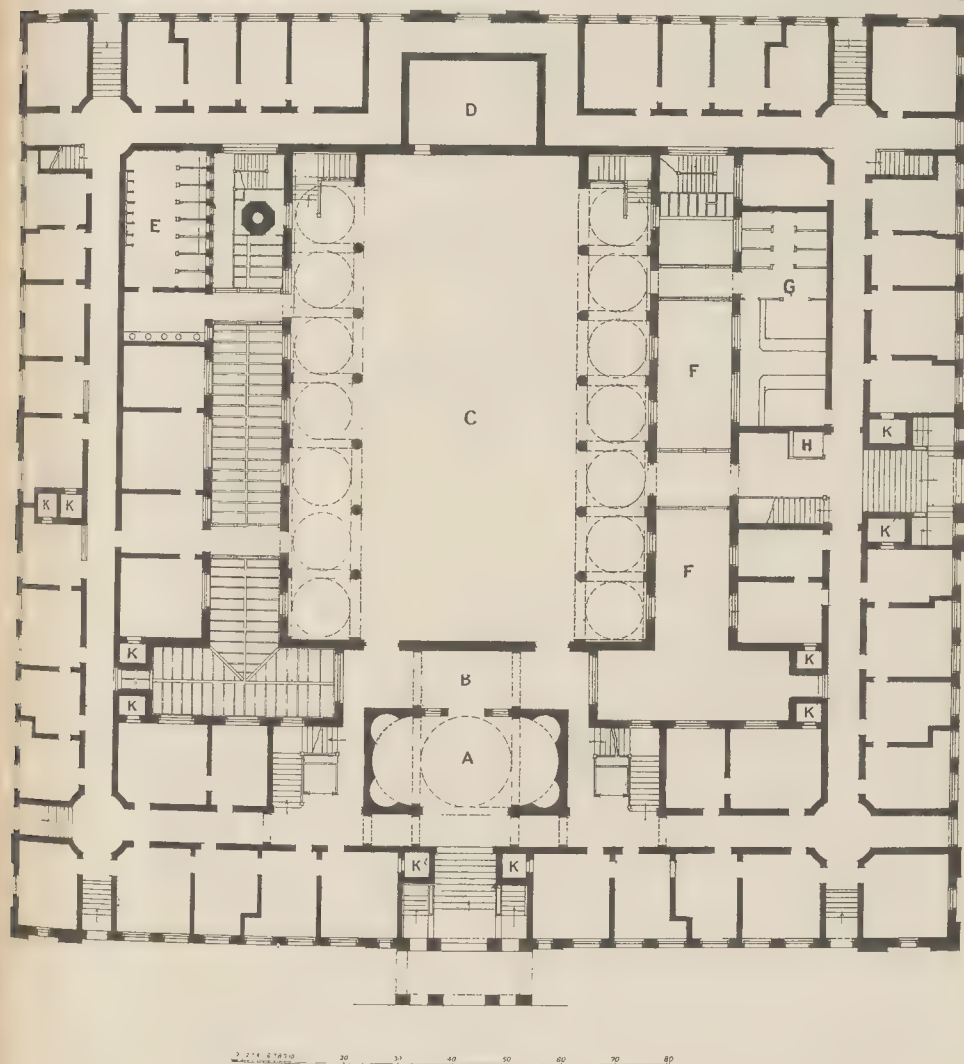
THIS building has been erected at a cost of 120,000*l.* The four external elevations are treated with red brick, dressed and rock-faced stone dressings, mouldings, pilasters, ashlar, etc. Internally the walls of the exchange hall are lined with marble and ornamental tile dado. The columns are scagliola with bronze bases and fine terra-cotta caps. The arched ceiling is in canvas plastic.

The building contains about 225 offices, with lavatories on all floors. It is heated throughout by steam radiators.

Messrs. W. Leck and F. Emley, of Johannesburg, were the architects, and Mr. C. Woods (Johannesburg) the contractor.

ENGINEERING SOCIETIES.

THE JUNIOR INSTITUTION OF ENGINEERS.—Visits of this Institution have recently taken place to the Brockie-Pell Arc Lamp Works, Worship-street, London, and to the New Ritz Hotel, Piccadilly, where the Skeleton-cage system of construction was seen. At the former establishment the members were received by Mr. James Brockie, the inventor of the Brockie-Pell Lamp, who gave an account of its development and construction, and described generally the necessary characteristics of an efficient arc lamp. In the workshops a number of lamps of different types were shown in course of manufacture, and in the testing-room demonstrations were carried out to illustrate the effect on the arc of two methods of regulation, namely, differential (main coil and shunt coil working in opposition) and shunt coil only; the result shown being that with the shunt coil alone the current might be varied very considerably without affecting the length of the arc, whereas



REFERENCES:—

A—Entrance hall.
B—Members' lobby.
C—Exchange hall.

D—Safe deposit.
E—Lavatory.
F—Open areas.

G—Post-office.
H—Lift.
K—Strong rooms.

(The remainder of the rooms are offices.)

New Stock Exchange, Johannesburg. Plan.

with the differential method the variation in length of the arc was very considerable with the same change in the current strength. The two lamps were run in series so that each had the same current passing through it. The party visiting the new Ritz Hotel were shown over by Mr. J. P. Bishop (joint architect with Messrs. Mewes and Davis) and Mr. Adam Hunter. The hotel, which is being constructed by the Waring-White Building Co. for the Carlton Hotels Co., is situated in Piccadilly adjoining the Green Park, and occupies the sites of the Old Bath Hotel and Walsingham House. It has a frontage to Piccadilly of about 230 ft. and an average depth of about 100 ft. The height from the street level to the top of the building is about 110 ft., and the basement floor is 20 ft. below street level. There are ten floors, including the basement, lower ground, and ground floors. The front of the building is carried up to within 2½ ft. of the roadway in Piccadilly, and an arcade formed over the pavement. This arcade will form a special feature of the building. The foundations are on the London clay at a depth of about 26 ft. below the roadway. A feature of special interest is the method which has been adopted for constructing the building. The type of construction is known as the "cage skeleton construction." The new Ritz Hotel affords the largest example of the type in this country. A skeleton of steel framework, capable of trying the whole dead weight of the walls, floors, and roof, in addition to the live loads and wind pressure, is being erected and is at present nearly completed. The walls are supported on girders at the level of each floor of the building. They carry no loads but simply act as a protection from the weather and for decorative treatment. The total weight of the building with the live loads is carried on the steel columns. Generally, the columns rest upon cast-iron base plates, about 3 ft. to 4 ft. square, which in turn rest upon a grillage of steel beams imbedded in cement concrete of sufficient area to distribute the load over the ground with a minimum depth of foundation. Cantilever foundations have been adopted for some of the columns next the adjoining buildings so as to retain the whole of the foundations within the site. Some of these foundations may be seen in the basement. The building is of fireproof construction throughout. The whole of the steelwork will be encased in masonry or concrete. The floors and roofs are being constructed of concrete steel on the Columbian system.

Correspondence.

SWINDON SCHOOLS COMPETITION.

SIR.—Will you kindly allow me through your columns to draw the attention of members of the R.I.B.A. to this competition?

The Competitions Committee have urged the Swindon Education Committee to modify their conditions which are very unsatisfactory. As the promoters decline to modify these conditions, members of the Institute are requested to refrain from competing.

JAMES S. GIBSON.

Chairman of the Competitions Committee of the Royal Institute of British Architects.

A QUESTION OF CONSTRUCTION.

SIR.—With reference to the very excellent working drawing of No. 33, Dover-street, published in your issue of March 18, may I inquire whether the tailing-in of the steel joists at each floor level is relied upon for the support of the oriel bays? The steel angle shown at the back of the corbel stones is evidently insufficient to hold them down.

My reason for the inquiry is that, where working drawings are published, it seems desirable, as the architect's sole note suggests, to show all the requisite details of construction.

ALPHA.

** Mr. Gibson writes:—"The 9 by 7 by 5½ lb. steel joists above the first floor level are bolted down at the ends to the main girders, and the 4½ by 4½ angle iron at the back of the oriel stone is also bolted to the same girder. The supports for the upper portions of the oriel windows at the second and third floor levels are tailed back into the main walls of the front, and the whole arrangement has made a satisfactory form of construction."

"BANISTERS."

SIR.—From Mr. Harris's letter in the current number of the *Builder* one might gather that it is only in recent years that the word

"baluster" has been supplanted by the corrupted form "banister." But, as a matter of fact, this "vulgar term for baluster," as Joseph Gwilt defines "banister" in the Glossary at the end of his "Encyclopædia of Architecture," is not by any means a novelty. In "The Rivals," first acted in 1775, Sheridan makes Fag say of Sir Anthony Absolute (Act II., scene I), "he come down stairs eight or ten steps at a time, muttering, growling, and thumping the banisters all the way"; and a slightly earlier example is to be found in Horace Walpole's "Castle of Otranto," first published in 1755, where we read, in Chapter 5, of "the uppermost bannisters of the great stairs."

BENJAMIN WALKER.

TESTIMONIAL TO MR. HENRY ADAMS.

SIR.—Mr. Henry Adams is retiring from the Professorship of Engineering and Surveying at the City of London College, which he has held for upwards of thirty-five years. A committee of some of his former pupils has been formed, and has met at the Surveyors' Institution, for the purpose of commemorating the occasion. It is desired to communicate with as many of his old pupils as possible, and, for this purpose, I should be very greatly obliged if you would give publicity to the matter by publishing a note, or this letter, in your valuable columns. Mr. Adams has lectured to about 4,000 pupils, the great majority of whom cannot now be traced except through the courtesy of the Press. Would any of them who see this announcement kindly communicate with me? Their signatures only to an address are sought.

J. L. CROUCH,
Chairman.

29, Basinghall-street, E.C.

COMPETITIONS.

CHURCH, NEW SOMERBY, GRANTHAM.—Mr. G. H. Fellowes Payne, the assessor in this competition, has selected as the best the plans of Mr. Bertram H. Tarrant, 65, Hosack-road, Upper Tooting. One hundred and four sets of plans were sent in, the authors of two of which were invited to send in amended plans, Mr. Tarrant's being finally selected.

SHIRE HALL, BURY ST. EDMUNDS.—The award in this competition is as follows:—First premium, No. 6, 504, (author, Mr. Arthur Field, 211, Woodbridge-road, Ipswich). Second premium, No. 10, 304, (Mr. O. Mahomed and Mr. B. Tarrant, 3a, Bank-buildings, Balham, S.W.). Third premium, No. 14, 204, (Mr. S. Warwick and Mr. H. Hall, 98, Lancaster-road, W.).

BOOKS RECEIVED.

AN ELEMENTARY HISTORY OF DESIGN IN MURAL PAINTING. By N. H. J. Westlake, F.S.A. Vol. II. (James Parker & Co. 32s.)

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE-STEEL.—XIII.

MAISON DE RAPPORT, AVENUE RAPP, PARIS.—(Continued).

THE roofing of this building is constructed in a manner generally similar to that adopted for the floors and ceilings, and between the upper and lower surfaces a cushion of air is confined, which has the effect of keeping the rooms immediately below moderately cool in summer and warm in winter. If desired the spaces in such a roof covering could be filled with non-conducting material for the purpose of providing further resistance to the conduction of heat from or into the building.

With the exception of the mansard slopes, the roof surfaces of the *maison de rapport* are flat, and, with the object of preventing the formation of cracks in the concrete-steel roof panels, a special method of construction was adopted, the principle of which can best be explained by reference to Figs. 94 and 95, the former representing the effects to be avoided and the latter the effects of the method actually followed.

The top diagram of Fig. 94 shows two stiffening ribs of similar construction to that illustrated in Fig. 91 ante. Between the ribs is a plate of armoured plaster wedged in position, as before explained, for the purpose of forming a centre for the deposition of the concrete-steel panel. This plaster plate, being deflected under the weight of the material deposited thereon, assumes a curved form, as represented diagram-

matically in the sketch. The result is that when the concrete layer has been finished with a level surface the slab has a section like that in the middle diagram of Fig. 94, and when used by workmen, or by the occupants of the house desiring to sit in the open air, the panels will be deflected at the middle, as in the bottom sketch, causing, or tending to cause, cracks at the points indicated, where the upper part of the section is in tension, because the connected series of panels constitutes a continuous beam. Although such cracks might not be dangerous from a structural point of view, they would certainly permit the percolation of water in rainy weather, and upon a roof so constructed it would be wise to lay a covering of zinc or lead to guard against inconvenience and damage in the rooms below.

A better system of construction, and that followed in the *maison de rapport*, is illustrated in Fig. 95. Here the upper diagram shows two ribs, which are similar to those in Fig. 94, but have triangular flanges at the top as well as at the bottom. Between these the plate of reinforced plaster is wedged in such a way that it presents a convex when viewed from above. When the concrete is deposited this arch is depressed slightly at the centre, but still retains a curved form, and when the top surface of the roof panel has been levelled off the section resembles that in the middle drawing of Fig. 95. The imposition of load upon the centre of one arch naturally has the effect of causing depression at the crown, but cannot result in rupture at the abutments, and the elevation of adjoining arches of the structure by expansion, suggested in the bottom sketch of Fig. 95, is equally harmless.

As shown in Fig. 87 ante, the roof is of the mansard type, the slopes being built of reinforced brick and consisting of two walls with an intervening air space, intended, as in the case of the flat surfaces, to modify the influence of exterior climatic conditions. Upon the outer brick wall of the roof slope that faces the Avenue Rapp enamelled tiles are fixed by means of Portland cement mortar. If preferred, it is easy to provide for covering the exterior face of such a roof slope with slates, as was done at the Ritz; or the brickwork may be coated with cement mortar finished by pressing into it a thin layer of stone chippings coloured to any desired tint. These chippings harden the face of the cement coating, and, with suitable colouring material, give the appearance of a tiled or slated roof without involving the cost of maintenance that is always necessary in the case of roofs covered with such materials.

The rain-water gutters at the foot of the mansard slopes are formed in reinforced cement mortar moulded in forms suitable to the architectural features of the building and tinted black ochre, thus giving an appearance resembling that of slate or cast iron. The system formed in the flat portions of the roof system so as to provide amply for carrying away rain water.

The dormers which occur in some parts of the mansard roof are built of reinforced brick, and the reveals are of the same construction. The overhanging of the *grande cour* are finished by a rendering of cement coloured to the required tint, while those on the main façade are covered with ornamental stoneware reinforced by steel wire. All skylight openings in the roof are constructed in reinforced brick.

The reinforced brick walls of the mansard, already mentioned, consist of an inner and an outer skin with an interior air space. Upon the courtyard the outer wall partition is built of white brick, relieved at some points by red brick and at others with enamelled brick, either plain or moulded, as required to suit the general scheme of the façade. The interior partition is in ordinary brick, which is employed also for the headers which bond the inner and outer skin of the construction. In the principal façade upon the Avenue Rapp the outer skin of the hollow wall is built of moulded stoneware blocks reinforced in the same manner as that employed for ordinary bricks.

The interior walls of the house are of two kinds—one built hollow and the other consisting of a simple partition of brick 11 centimetres thick. All the inner surfaces of the outside walls and of partition walls are finished suitably to the purposes for which the various apartments are intended.

Both the ground and the ceiling plaster *de service* are formed with a reinforcement of reinforced cement mortar 5 centimetres thick. Above the surface of this slope are two stiffening

ris, one placed at each side and corresponding with the customary "string boards." The treads, also of reinforced cement mortar, are moulded so as to give a channel section, and, of course, are set in position with the flat side uppermost. Above the *grand escalier* is a water tank for the operation of the passenger lift, the tank being constructed of reinforced brick and cement.

A distinctly novel arrangement in this building is that some of the chimney flues, as well as all the ventilation ducts, pass entirely within the space afforded by the hollow wall construction. Between the inner and outer walls two series of metal lathing are fixed at the required distances apart and the lathing is plastered over to form the conduit. In this way all flues required for the rooms in the front of the house are carried up inside the walls of the principal façade, while others are situated in the thickness of the inner walls. The walls containing smoke flues also support the floors of the building, an arrangement that would clearly be inadmissible in ordinary construction. The flue of the hot-air stove is of similar construction, and close to it are situated the water pipes and drain pipes proceeding to and from various parts of the house. The drain pipes are of Doulton ware placed in plastered casings formed between the inner and outer walls of the building and embedded in cement.

We now direct attention to a most interesting constructive feature, consisting of a portion of the building which overhangs the *grande cour*, as indicated by the shaded area in Fig. 96. This projecting angle, of which the bases measure approximately 7 metres and 3.5 metres, virtually constitutes a great corbel six stories in height and extending from the first floor to the top of the house. Beneath it is a space giving access to the *remises*, or coach houses, as indicated on the ground plan, Fig. 96. The column, which is shown in elevation in Fig. 97, is of stone, and appears to support a very great load. But in reality it has no work to do, and might have been omitted entirely without impairing the stability of the structure. It was included chiefly for the sake of appearances, both structural and architectural. As a matter of fact, the column was not put in its place until the whole of the work above had been completely built.

Fig. 97 has been drawn with the object of making clear the principle involved in this bold piece of structural engineering. The lower portion of the corbel is represented by the lines AB, BC, these being the lower boundaries of the brickwork which actually transmits the loads to the walls of the main building. The upper portion of the corbel is not shown in Fig. 97, as it was not necessary to occupy space by continuing the drawing so as to include all the stories of the house. It will be understood that, as the two outer walls of the corbel are of reinforced brick, they have been thoroughly connected by means of steel network with the walls of the main building, to which they are further tied by the floors of stories Nos. 2 to 7. These floors, permeated by steel network connected with the network of the walls on every side, are in effect horizontal, very wide, and shallow tie-beams. Further, we have the cross walls shown in Fig. 96, and these also are tie-beams, very deep and thin. Taking into account the vertical outer walls, the inner cross walls, the horizontal floors, and the roof construction, this projecting angle of the house is seen to be nothing more than a huge cantilever braced in the most efficient manner, and quite independent of any support beyond that derived from the main walls to which it is secured, and with which it is incorporated. The foregoing explanation relates only to the part above the lines AB, BC in Fig. 97.

We will turn next to the details drawn in broken lines. In the first place we have two triangular wall surfaces, which, taken together, form the area ABC in Fig. 97. These portions of wall are in reality suspended from the upper part of the reinforced brickwork, and are thoroughly bonded with it in the ordinary way, as well as by the network of steel wires passing vertically through and between the bricks. The floor of the first story is also suspended at the outer edges, while along the two inner sides it is supported by the walls of the building. The other floors are supported. In this way the suspended portions and the column are merely drawn in dotted lines for the purpose of ready identification. When the great console, with its dependent walls and floor, had been built, the floor of the first story, with the whole

of the six stories above, remained suspended in mid-air until the stone column was erected in its place to give this portion of the building a reasonable appearance of security, and to insure outward compliance with the form of construction to which the eye is accustomed. Although the designer entirely disregarded the support afforded by the column, it must not be forgotten that this member is really capable of taking the weight of the projecting angle and, being placed beneath it, must take its share of the load, thereby relieving the reinforced brickwork of strain, and adding very materially to the strength of the construction as a whole.

Another singular piece of design is to be found in an arch, of 7 metres span, over a large window of the third story. This arch appears to support a gallery above, but in reality does nothing of the kind, being supported by the gallery, which is about 4 metres high and, stretching from side to side of the façade, is practically a braced girder of great strength.

For lighting the basement, pavement lights are provided in the *grande cour*, the *petite cour*, and the *courlette*. Pavement lights of the kind ordinarily used in Paris having frames of T bars, as in Fig. 98, naturally block an unnecessarily large proportion of the light available. To obviate this disadvantageous feature the system illustrated in Fig. 99 was introduced by M. Cottancin. The framework consists merely of

steel wires 4.4 millimetres diameter, which pass along grooves in the sides of the glass panels and are woven together so as to constitute a network capable of supporting all the weight likely to come upon the construction. As the wires are of small diameter, they obstruct very little light, and, being laid in the circular holes formed by two semi-circular contiguous grooves, the glass panels can be brought close together and jointed with cement. The joints have the effect of refracting the light somewhat in the manner accomplished by the Luxfer prisms, although they can scarcely do this so efficiently.

The kitchen, sculleries, and other domestic offices, as also the lavatories throughout the house, are finished with wall surfaces in white enamelled brick. No wall tiles or other materials for forming a veneered wall surface have been used, the architect rightly believing these to be undesirable because of their liability to become detached in course of time. The pantries have walls of reinforced brick and cement.

The kitchen water tanks are built of enamelled stoneware tiles moulded with grooves, like those of the glass panels in the basement lights, and similarly are connected with wire reinforcement and jointed with cement. The interior face of each tank is formed by the enamelling of the tiles, and the outside is rendered in cement or plaster.

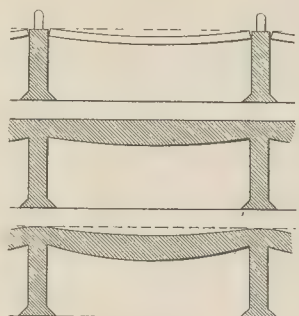


FIG. 94.

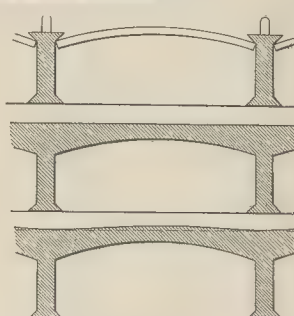


FIG. 95.

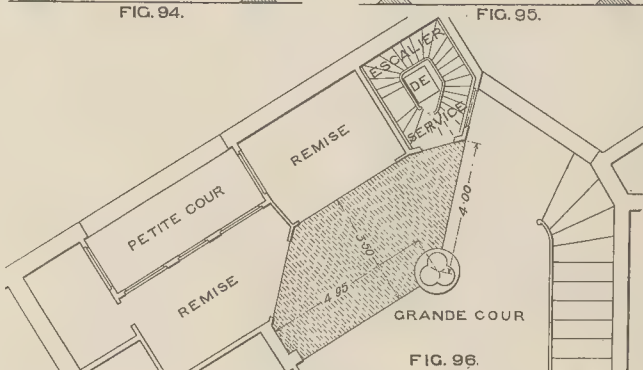


FIG. 96.

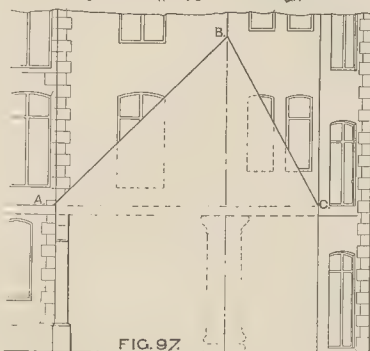


FIG. 97.

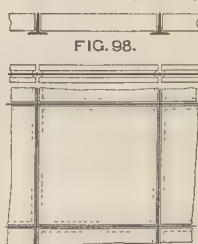


FIG. 98.

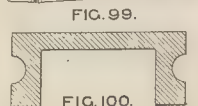


FIG. 99.

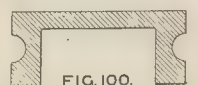


FIG. 100.

Some walls, in parts of the building where it was particularly desired to provide resistance against the conduction of heat, are constructed of hollow earthenware blocks of the section illustrated in Fig. 100. The side of the block, which is at the top in this drawing, forms the outer face of the wall, and the space inside is filled with non-conducting material. The interior wall surface can then be finished in any manner desired. The blocks are moulded with grooves for the reinforcing network, and can easily be set in walls constructed of ordinary brick.

The building described above is a good example of reinforced and also of fire-resisting construction. One excellent feature is represented by the strength of the flat roof terraces, upon which firemen can move freely and portable fire engines may be employed without fear of causing damage, in case of fire breaking out in any adjacent building.

OBITUARY.

MR. NICHOLL.—We regret to announce the death on March 21, at his residence, No. 1 Caversham-road, London, N.W., of Mr. Samuel Joseph Nicholl, aged 78 years. Mr. Nicholl was a pupil of J. J. Scoles; he was the Royal Institute of British Architects' Medallist (Essays), 1845, and was elected Associate in 1847. He was architect for the reparation, in 1884, of the Roman Catholic Church of which he designed the new reredos across the whole width of the nave, the stone and alabaster altar, and the parquetry laid on the floors of the sanctuary and chapels. We have illustrated his designs for the Church of Our Lady of the Sacred Heart, Wellingborough, having sittings for 400 persons, with a sacristy style (November 6, 1886), and the Roman Catholic Church of St. John the Baptist, Brighton, of which he remodelled the entire interior, opened out the roof, added the bell-tower and chapel of the Holy Rood, and substituted a wide and enriched arch for the porch (May 21, 1887, and September 1, 1888, interior view). He prepared the plans and designs for completing the altar, and for the reredos, of the Roman Catholic Church of St. Charles Borromeo, in Upper Ogle-street, Marylebone, 1902. In collaboration with the late J. T. Willson, he was architect, fifty years ago, for the enlargement and virtually the rebuilding, after a plain Romanesque manner, of the Roman Catholic Chapel of St. John, at Lincoln, and the schools. In the interval of about ten years from 1859, during which he and J. T. Willson worked together, Mr. Nicholl was joint architect with him of the chapel and lodge at St. Patrick's Cemetery, Low Leyton (1861); of the Roman Catholic churches of St. Charles, in Upper Ogle-street, mentioned above, at the Sacred Heart, at Accrington; St. Mary, Turnham Green; St. Katharine, West Drayton; and of one at Bilbao, Spain; of the schools for St. James's Roman Catholic Church in Spanish-place, W.; and schools at Wapping, Little Crosby, and North Hyde, Middlesex; and for the enlargement, with improvements, etc., of the convents at Chelsea and Atherstone. At Mr. Willson's request he became his co-adjutor, 1895, for the girls' schools of the Dominican Priory, Havestock Hill, N.W., and, in 1892, made, conjointly with him, the designs for the memorial at Portsmouth to Sir Charles Napier, and of that which commemorates the cruise of the *Chesapeake*.

MR. WALLER.—We regret to announce also the death, on March 22, at his residence in Barnwood, near Gloucester, of Mr. Frederick Sandham Waller, aged 82 years. He was elected a Fellow of the Royal Institute of British Architects in 1856, and served as a member of the Council. Mr. Waller and his son, Mr. Frederick William Waller, constituted the firm of Messrs. Waller & Son, of College Green, Gloucester, architects and surveyors, which was dissolved in November, 1901. The late Mr. F. S. Waller was Resident Architect to the Dean and Chapter of Gloucester Cathedral; in 1847 he carried out the first restoration of Abbot Serlo's crypt, 1089-1100, and the extensive repairs and restoration of the general fabric in 1873-90 were effected under his directions and superintendence, mainly after the designs prepared by Sir G. G. Scott. The plan which we published on December 5, 1891, in No. XII. of our Series, "The Cathedrals of England and Wales," was made from plans and surveys prepared by Mr. Waller, and he compiled the account of the structure and history of the cathedral which we were enabled to publish in that number of the *Builder*. In our number of July 17, 1897, No. VIII. of our Series, "The

Architecture of our Large Provincial Towns," we gave an illustration of the firm's designs, after the Early French Gothic style, for the Municipal Technical College and School of Art, Green Hill, Derby, 1876-7, to which additions were then being made by them. Mr. Waller designed the canopied reredos, of richly-carved stonework, for St. Michael's Church, and the carved-wood reredos (1889) for the Church of St. Mary-de-Crypt, both in Gloucester, and he restored the wooden screen of St. Mary's Church, Beverstone. He was architect of the Free Public Library and of the new building for an extension of the technical schools in Gloucester, for the restoration of Oldbury-on-Severn parish church, after the fire in 1897, and of the parish church of Naunton, Gloucestershire; for the cottage hospital at Burford, Oxfordshire; for the enlargement of the Grammar School, Cirencester; and of the additions, with science department, to the Ladies' College, Cheltenham. The firm were appointed architects of the new town hall erected on the winter garden site, Cheltenham, which was opened in December, 1903. Mr. Waller, in conjunction with Mr. H. Medland, prepared the plans and designs for the Infectious Diseases Hospital at Over, in the county; and the firm was architects of the nurses' home, recently added to the Gloucester Infirmary. Mr. Samuel E. Waller, the painter, who died two years ago, was, we believe, a son of the deceased.

MR. T. D. BARRY.—We regret to have to record the death of Mr. T. Denville Barry, of Liverpool, well known for many years there and in the Lancashire neighbourhood as an accomplished architect of the Gothic revival school. Mr. Barry was a native of Cork (son of Dr. Barry, of that city), but came to Liverpool in 1845, and entered into partnership with another well-known local church architect of the time. After a few years he dissolved partnership, and went to Norwich, where he was City Surveyor, and returned to Liverpool in 1872, and continued the practice of his profession in partnership with his sons. For the last seventeen years he has been living in practical retirement from his profession. He passed peacefully away, in his ninetieth year, on the 4th inst., at his residence, Airburgh. During his life he was President of the Liverpool Architectural Society, and his services were at one time in great demand for arbitrations. Among the many buildings which Mr. Barry carried out may be named the Hope-street Unitarian Church at Liverpool (Brown & Barry), St. Andrew's, Southport, and St. Peter's, Birkdale; at Norwich he carried out the Great Hospital Industrial School and the Thorp Hamlet School and parsonage, the Corn Exchange, the Fish Market, and the Cattle Market; also the Equitable Insurance office; the silk mills, factory, warehouse, and distillery; also the Exchange, the Waterloo, and the Star Hotels. In London and neighbourhood he built Tulse Hill Church, Clapham-road Church and Schools, and Orphan Working School Church; also the Whitechapel Workhouse. Mr. Barry was also architect for the laying out of numerous cemeteries and the chapel and lodge erections, including Foxthorpe Park (Liverpool), St. Brydion, Wigan, Heywood, Atherton, Warrington, Runcorn, Bakewell, and Henley-on-Thames. He was engaged a great deal at the Isle of Man, and was architect for the parish churches of Peel, Glenmoye, Patrick, and Port St. Mary; also of the Presbyterian Church at Ramsey. He was also architect for the police offices and fire-engine station at Leamington, St. Paul's Schools, Grange, and Trinity Schools, Coventry; the College Chapel, Didsbury; St. Matthew's and St. Bartholomew's churches, Bolton; the Congregational Church, Dublin; memorial church to Bishop Shirley, Derby; Fisk Memorial Church, Malvern; and the workhouse, Market Drayton. He was also engineer for various sewerage works, bridges, river walls, and piling, and was engaged on many important surveys.

MR. GEORGE HENDERSON.—Mr. Henderson, of the firm of Hay & Henderson, architects, Edinburgh, who died, after a short illness, on Friday last week, was interred in the Grange Cemetery. The son of Mr. John Henderson, architect, Edinburgh, he went on the completion of his professional training to Australia, and there carried on business as an architect for twelve years in Geelong. Returning to Scotland, he entered into partnership with the late Mr. William Hay, along with whom he was engaged in various building operations, including the restoration of St. Giles's Cathedral. In all subsequent alterations on St. Giles's Mr. Henderson was employed. He also acted for some years as architect to St. Mary's Cathedral, Edinburgh, in connexion with which appointment he carried through the additions to Old Coats House, adjoining the cathedral. Trinity College, Glensalmond, origi-

nally built by Mr. Henderson's father, was very largely added to under his care, and after the disastrous fire, by which a large part of the college was burned, Mr. Henderson was again retained by the governors to rebuild it. He was also employed in many works in various parts of the country—by the Earl of Home, at The Hirsell and Douglas Castle; by Mr. William Ramsay, for whom he built additions to Bowland House; by Mr. J. Peebles Chapman, for an addition to Collieston Castle; and by others. For Dr. William Chambers he restored the tower of the ancient church of St. Andrew at Peebles. At Galashiels he built St. Paul's Parish Church and the Free Library. The fine parish church at Distington, in Cumberland, with the schools adjoining, was also his work. Under his care the nave of St. Mary's Church, Haddington, was restored, and he also prepared for the heritors of that parish designs for completing the restoration of the chancel, transepts, and tower; but this scheme has not yet been carried out. The parish church of Craiglockhart, near Edinburgh, was Edin. work, along with the tower added to it by Sir Oliver Riddell. Mr. Henderson was also employed for buildings of importance in Canada and other colonies. The cathedral at Bermuda, in the West Indies, now nearly finished, was designed and built by him, as was also the residence of the Governor of Ontario. At the time of his death Mr. Henderson had just completed the extension of the nave, with the addition of a side chapel, to the building of St. Paul's Episcopal Church, Carrubers-close, Edinburgh. He was also engaged in the restoration of the ancient parish church of Corstorphine, and the work is nearly finished.—*Scotsman*.

MR. STURGE.—Mr. William Sturge died on March 25, at his residence, Chillsdale, Tyndall's Park-road, Clifton, aged 84 years. He was senior partner during a period of nearly fifty years of the firm of Messrs. J. P. Sturge & Sons, of Bristol, land agents and surveyors. Mr. Sturge was a member of the Corporation of the City of Bristol, and had an extensive practice in the West of England. He was an original member of the Council of the Surveyors' Institution, and served as President in 1878-9, and in 1879-80. In 1860-70 he made a survey of the City of Bristol for the purposes of the assessment of the borough rate; on two occasions he was appointed to act in an extensive capacity to the County Rate Committees of Somerset, and of Glamorgan, for the fixing of the county rate.

MR. JOSEPH IVES.—The death occurred, the 26th ult., at his residence, in Wells-road, Shipley, of Mr. Joseph Ives, who had deceased was for many years associated with a firm of contractors, Messrs. William Ives & Co., of Crownwell-road, Shipley, who were the builders of the Bradford Town Hall and many other structures.

GENERAL BUILDING NEWS.

THE RESTORATION OF YORK MINSTER. Simultaneously with the work of erecting the west front of York Minster, now proceeding, it has been decided to restore the north and south aisles of the nave by the erection of the missing pinnacles and flying buttresses on the north side, and the flying buttresses on the south side. The existing buttresses on the north side are to be surmounted by pinnacles, decorated to correspond with those on the south aisle wall. They will be 55 ft. in height from the top of the aisle parapet, at the springing of the flying buttresses, equivalent to a height, at the apex of the pinnacles, of 106 ft. from the ground level. The designs are faithful copies of the level. The flying buttresses, which will have a span of 27 ft. 10 in. in their spring from the aisle parapets to the top of the clerestory walls. Those on the south side will be similar to those on the north. The whole of the work is to be executed in the most durable material formerly used in the construction of the building. The whole of the outer windows for the Chapter House, in order to preserve the beautiful stained-glass from further erosion under the York weather, has now been completed, with the exception of the north aisle, and all the stonework has been completed. Great progress, too, has been made in the south-west tower; it is anticipated that it may be completed by the middle of next winter. This will only leave the great west window, between the two towers, to be completed, and then the restoration will be complete. It is already occupied some five years, and has been completely designed and drawn by Mr. G. F. Bodley, R.A., for a new and more richly carved and decorated, and this will shortly be commenced. The work is being carried out by Messrs. J. & W. Walker, of York, and the memorial-stones of the Mardy W. Walker.

estate were laid a short time ago. The new building will cost about 6,000. The architect is Mr. Edmund Williams, C.E., Cardiff, and the contractor, Mr. J. B. Mundy, Cardiff.

DRILL HALL, ELGIN, N.B.—The foundation-stone has just been laid in the Cooper Park, Elgin, of new headquarters of the 3rd and 4th Volunteer Battalions Seaforth Highlanders. The front part of the hall is built in rock-faced square rubble, finished with a tower in the Scotch Baronial style. The main building on front is surmounted with a final bearing the date, and the emblems of the Seaforth Highlanders.

The tower rises to 46 ft. The principal hall measures 90 ft. by 45 ft. A gymnasium is provided. To the east of the front door and through the tower is an inside hall, and to the left is the men's reading and recreation room, which measures 23 ft. by 23 ft. Off the inside hall a stair leads to the upper story. This wing includes the sergeant-major's office, a room for the adjutant, a room for the quartermaster, and an officers' room. From the lobby a stair will lead to the tower. The back wing of the building will consist of the armoury, clothing store, cloakroom, and a room for a Maximal gun, and the quarters of the sergeant-major. The hall is being built under the personal supervision of Mr. W. C. Reid, by whom the plans were prepared.

CHURCH, HECKMONDWICK CHURCH.—The corner-stone of the new chapel, to be erected at Heckmondwick Parish Church, was laid on the 24th ult. The new chapel, which is expected to cost about 2,700, will increase the accommodation of the church by about forty-four seats, in addition to making up for the removal of the galleries. It is really part of a scheme for the entire rebuilding of the church. The next portion to be taken in hand will be the nave, the tower being left till the last. The architect is Mr. Hodgson Fowler, of Duxley.

SCHOOLS, TUNBRIDGE WELLS.—The Mayor of Tunbridge Wells laid a corner-stone of the new St. Luke's Schools, in Silverdale-road, Tunbridge Wells, a short time ago. The buildings have been erected from plans prepared by Mr. E. Cronk, architect.

THEATRE, EDINBURGH.—Mr. R. C. Buchanan, Glasgow, has acquired a building site at Tarvit-street, Home-street, and Leven-street, Edinburgh, with a frontage of 95 ft. to Leven and Home streets, and 200 ft. to Tarvit-street, on which is to be erected a theatre. The site includes the old brewery and Leven House. In front there will be four shops, with the main entrance to the theatre in the centre. Above the shops will be a billiard-room, with twenty tables. The whole building is estimated to cost from 60,000, to 70,000. Arrangements have been made to with the tenants on the site, and building operations are to be commenced on May 28. The architects for the building are Messrs. J. D. Swanson & Syme, Kirkcaldy. Messrs. W. S. Cruikshank & Son, builders, Edinburgh, have been entrusted with the work.

HOTEL, BLOOMSBURY.—A new hotel, which is to be called the Ivanhoe, is being erected on a site covering an area of some 1,800 sq. yds. at the corner of Bloomsbury-street and Great Russell-street. The ground floor will be constructed of Portland stone, and rising above the first floor balcony will be a facade of six stories in brick and stone, with a tower and dome at the corner of Bloomsbury-street and Great Russell-street. The interior of the hotel will be fitted up with suites, as well as single rooms, making in all about 300 bedrooms. The reception and dining rooms will be decorated in mahogany panelling, plaster, and marble-work, and the hotel will be constructed throughout on fireproof principles, the floors being a fireproof invention of Messrs. Little, Edinburgh. The work is being carried out under the designs and under the supervision of Mr. T. Duncan Rhind, Edinburgh.

GUARDIANS' OFFICES, HALIFAX.—The new administrative offices erected for the Halifax Division of Guardians on the site of the old Turkish baths near the workhouse, were opened recently. On the ground floor of the new building is a waiting-room for applicants for out-relief. Immediately adjoining, and connected by a corridor, are six separate sections, in which the business can be conducted simultaneously. Rooms are also provided for the relieving officers, and for a hall porter, together with lavatory accommodation. The first floor, approached by a staircase, is set apart for the large board-room, together with retiring-rooms for guardians and clerks, and lavatory and cloakroom accommodation for male and female guardians. There is accommodation for fifty-five guardians and officials. A gallery occupies the east end, opposite the chairman's desk. The building has been erected from the designs of the architect, Mr. W. Clement Williams, in the English Renaissance style. The various

contractors were as follows:—Mason, T. Pickles, Luddenden Foot; carpenters and joiners, J. Charnock & Sons, Halifax; plasterer and glazier, Arthur Birth, Halifax; plumber, J. H. Pollard, Halifax; heating, T. Boocock, Halifax; ironfounder, John Berry, Halifax; concretors, J. Bancroft & Son, Halifax; painting and ornamental plastering, Jonas Binns & Sons, Halifax; electric lighting and telephones, J. Sunderland & Co., Halifax; board-room fittings, seating, etc., also portion of furniture for section-rooms, Greenwood Howarth, Halifax; steel roof, J. Handyside & Co., Derby; marble mosaic paving, J. Ebner, London; and sliding partitions, Henry Whiteley, Rishworth. The total cost of the work, including the site and furnishing, is 7,927. 0s. 6d.

HOSPITAL EXTENSIONS, MIDDLEBROUGH.—On the 24th ult. extensions to the Middlebrough Sanatorium and the Small-pox Hospital at Hemlington were opened. The extensions to the Sanatorium consist of two pavilions designed by Mr. Frank Baker, C.E. They are built of Accrington red pressed bricks, and provide accommodation for sixty patients. Two small private wards are provided. The floors are of pitch-pine, and the heating apparatus is on the low-pressure system, with two radiators in the centre of the floor. The Sanatorium has now accommodation for 190 patients with quarters for a resident staff of thirty-five. The Small-pox Hospital at Hemlington is some four and a half miles from Middlebrough, and stands on what used to be known as Belle Vue Farm. The grounds comprise some 67 acres, and the hospital buildings have been erected on a field of 4 acres on the highest part of the farm.

NEW OUT-PATIENTS' BLOCK, LEICESTER INFIRMARY.—A new out-patients' block has just been opened at Leicester Infirmary by the Marchioness of Granby. The department is approached from Parliament-street, which gives access to an open yard, at one end of which is a perambulator porch. At this end patients will be admitted. The old patients will approach the porter's room, where they will obtain their books and pass into the waiting-hall. New patients will be directed to the registration-room, and from there to the waiting-hall. This hall is an apartment 85 ft. long by 29 ft. wide, and around it are grouped physicians' consulting-rooms and surgeons' consulting-rooms, together with the surgery and dressing-rooms, male and female examining-rooms, and a small room for minor operations. A room is also provided for ear, throat, and dentistry cases, with dressing-rooms, and there is a room for ophthalmic purposes, with its own small operation-room. In one of the recesses in the large hall a refreshment counter has been provided. When the patient has been attended to, he will pass on to the dispensary to obtain his medicine and out of the exit door at the opposite end of the building to that by which he entered. There are small rooms for the nurses and cleaner. In the basement are fresh-air trunks carried round the whole of the large hall. The air is drawn through a dry filter and sent along the trunks by an electrically-driven fan, 5 ft. in diameter. In its passage it is warmed to a required temperature by hinged batteries of a new type fixed at the base of the inlet flues, which convey it to the various rooms. These hinged batteries are designed to permit of thorough cleansing under and behind, and also at the base of the flues. The warmed and cleansed air is delivered to inlets, nine of which are to be seen in the central hall at a height of about 9 ft. Having circulated, it is drawn off at outlets, about 6 in. from the floor level, and taken by way of a main trunk formed in the roof space to the extraction turret, being assisted in its exit by a steam pilot coil fixed at the base of the roof outlet. The architects of the building are Messrs. Everard & Pick, of Leicester, and those engaged in the work were:—Contractors, Mr. Chas. Wright; stone-masons, Messrs. C. Jayes & Son; slaters, Messrs. S. Broadbent & Co.; plasterers, Messrs. A. & W. Crews; founders, Messrs. G. Potter & Sons; plumber and glazier, Mr. W. Freer; painters, Messrs. T. C. King & Co. (all of Leicester); sanitary fittings, Messrs. Doulton & Co., London; concrete flats, The New Expanded Metal Company, London; asphalt flats, Messrs. Val de Travers, Birmingham; electric light, Messrs. Gent & Harley, Leicester; ironmongery, Messrs. Collins & Co., Leicester; heating engineers, Messrs. Ashwell & Nesbit, Leicester; wall tiling, Messrs. Pilkingtons, Manchester; terrazzo floors, Messrs. Turpin, London; joinery fittings, partly contractor and partly Messrs. S. Thomas & Son, Leicester.

CLOCK TOWER, MORECAMBE.—A clock tower is to be erected on the promenade opposite Queen-street, Morecambe. The total height will be about 50 ft. The architects are Messrs. Cressley & Keighley, Morecambe.

SANITARY AND ENGINEERING NEWS.

NEW WATERWORKS, TADMORDEN.—The new waterworks, erected by the Tadmorden Corporation, have just been opened. The new works are situated at Gorpely, in the Dulesgate Valley, about three miles from the centre of the town. It is estimated that the total cost will be over 60,000. Mr. G. F. Deacon, of London, has been the consulting engineer, and Mr. Benjamin Lumb, of Tadmorden, the contractor.

SEAHAM HARBOUR DOCK WORKS.—A meeting of the Newcastle Association of Students, in connection with the Institution of Civil Engineers, was held on the 23rd ult. in the Armstrong College, Mr. Gerald Stoney presiding. Mr. P. T. Gask, M.Inst.C.E., read a paper, prepared by himself and Mr. Thomas Thompson, M.Inst.C.E., on the construction of Seaham Harbour dock works. He said the old docks were built by the grandfather of the present Marquis of Londonderry, about the year 1828, and consisted of a north dock, 23 acres, with an entrance 33 ft. wide with 16 ft. of water on the sill at high water, and a south dock of about the same size, and the sea approach to the harbour was protected by a north and a south pier, with an opening between them of 120 ft. The increase in the size and draught of steamers made a considerable extension of the dock accommodation necessary. The Seaham Harbour Dock Company was formed in 1838, and took over from Lord Londonderry all his rights in the existing dock, and obtained an Act of Parliament for the construction of a new dock and protecting piers. The contract was let to Messrs. S. Pearson & Son for a sum of 378,000, and the work was begun in March, 1899. The new works comprised two protecting piers, enclosing the site of the old docks as well as the new ones. The dock was 1,000 ft. long by 450 ft. wide, with a depth of water of 27 ft. 6 in. low water. A new entrance was provided with a width of 65 ft. and a depth on the sill of 25 ft. 6 in. This entrance was closed by a pair of timber gates, and for use in heavy weather storm gates were provided. Land on the north side was reclaimed to form a blockyard for the construction of the concrete blocks with which the two piers were to be built. For moving and stacking the blocks a 30-ton steam Goliath crane was used, with a span of 100 ft. The north pier started with the root walls enclosing the mass of rock upon which stood the old lighthouse. The pier had a total length of 1,383 ft., and was built with a radius of 1,440 ft. The inner half of the pier had a width at coping level of 25 ft., and the outer half was widened out to 30 ft. as the depth of water increased, and the gradual curvature of the pier brought it more directly exposed to the N.E., from which direction the heaviest seas were experienced. The blocks used were from 12 tons to 28 tons in weight. To set the blocks a Titan crane was obtained by the contractors, capable of lifting 30 tons at a 60 ft. radius. Subsequently an air-compressing plant was procured for working a diving bell, and a dynamo for lifting purposes. The foundations for the pier were on the magnesian limestone. The length of the pier in 1904 was 590 ft. The surface of the pier was to be paved with granite setts between the copings, and the cost of the pier worked out at about 90s. per lineal ft. The south pier was 878 ft. long, and was similar in construction to the north pier, except that it differed slightly in width. The entrance for the passage of vessels would be 280 ft., and it faced the south-east; and the distance from this point to the new dock entrance would be 300 yds. The new gates were of karri wood from Western Australia, and each leaf weighed something like 90 tons. Hydraulic machinery was provided for working them. Stairways were provided to deal with high capacity waggons, and, owing to the height of the cliffs upon which the storage sidings were to be placed, it had been possible to lay them out on the gravity system, and to work them, as at Tyne Dock and Sunderland, without the use of engines from the time the full waggons left the storage until the empty waggons have left the staging. It was anticipated that, when the stairways had been brought into use, about 2,000,000 tons of coal per annum would be dealt with.

FOREIGN.

GERMANY.—A competition, open to German architects, is to be held for designs for a house of business for the "Silesian Society for the Promotion of National Culture"; three premiums are offered of 1,500, 1,000, and 750 marks, respectively.—The Church of St. Lawrence at Nuremberg is to be restored as far as possible to its original form.—The sum of 35,000 marks has been voted for the preservation of ancient buildings and monu-

ments in the Grand Duchy of Hess.—The ancient Town Hall and the Chamber of Commerce at Leipzig are to be restored at a cost of 650,000 marks.—The Church of St. Michael at Hildesheim is to be restored, and the safety of the famous painted ceiling over the central aisle ensured, under the direction of Professor Mohrmann. In the competition for designs for a facade for the new station at Karlsruhe, the first premium (5,000 marks) was awarded to Professor H. Billing and Herr W. Vittali, of Karlsruhe, the second (3,000 marks) to MM. Reinhardt and Süssenguth, of Charlottenburg, and the third (1,500 marks) to Herr Stürzenacker, of Karlsruhe.

SWITZERLAND.—On the west facade of the Government schools at Lenzburg there are two walls unbroken by windows, which have been divided by four large niches, each running the height of two stories; these are now filled by four decorative pictures by Herr Werner Büchli, representing scenes from the lives of Tell, Winkelried, Zwingli, and Pestalozzi.

The church at Kempraten, near Rapperswil, is being restored to its original Gothic character, under the direction of Herr P. A. Kuhn.

AUSTRIA.—By the destruction of certain buildings in the neighbourhood, the Carmelite church built at Vienna in 1632 is once more laid open to view, after a concealment of about three centuries; the church is to be stored, and the work of restoration will begin early in May.—Herr Rudolf v. Alt died at Vienna on March 12, in his 93rd year; the artist painted chiefly in water-colours, and confined himself to works of an architectural character.—A central laboratory is to be built at Vienna for the purposes of scientific and technical research.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. G. Elkington & Son, architects, have removed their offices from 35, Cannon-street to Norfolk House, 7, Laurence Pountney-hill, E.C.—Mr. John Murray, architect, has removed his offices from 7, John-street, Adelphi, to 11, Suffolk-street, Pall Mall, S.W.—Messrs. Horace W. Cullum & Co., makers of soundproof partition slabs, have removed from 28, Budge-row to Graven House, Kingsway, High Holborn, W.C.

BUILDERS' EXCHANGE, SHEFFIELD.—Councillor John Dawson, of Huddersfield, recently lectured before the Sheffield Builders' Exchange on "A Visit to Athens." Mr. A. J. Forsdike presided over a large attendance, being supported by Messrs. J. Biggin, H. D. Cook, T. Roper, D. Corrie, P. Molloy, H. Wilkinson, J. R. Wignall, W. Jones, J. G. Waring, and J. L. Taffe (secretary). The lecturer commenced with a description of the Acropolis and the temples, theatres, and various places of assembly, which stood erected on the famous mount in the palm days of Athens. He was assisted in conveying to his listeners an idea of the buildings and the relative positions they occupied by a large painting of the Acropolis as it was in the days of the Apostle Paul. He pointed out the fact that Greece had given to the world more great men, whether statesmen, orators, sculptors, or philosophers, than any other country of its size, and he quoted several authorities to show how Greece, in the days of her prosperity, combined severe simplicity in the home with lavish ornateness in all that applied to civic concerns, which accounted for the magnificence and unrivalled beauty of the public buildings of that time.—Mr. J. Biggin proposed, and Mr. J. D. Cook seconded, a vote of thanks to the lecturer, which was supported by the Chairman (Mr. A. J. Forsdike).—*Sheffield Independent.*

DICKS' LONDON STREET GUIDE.—At the cost of one penny Mr. Dicks furnishes a small paper-covered guide giving in three columns the names of streets (alphabetically) and their postal district, the nearest main thoroughfare, and the nearest railway station. It is a most useful pennyworth of information.

THE "MAJOR" PATENT WINDOW BALANCE.—This, which is one of the latest of the many modifications of the ordinary sash window, is an invention hailing from Brisbane, Australia, and has been examined by us at the Company's temporary showrooms at No. 4, Budge-row, E.C. The method of hanging the sashes is simple and ingenious. A metal bar is centrally pivoted on each frame-jamb, the pivot being, approximately, at the middle of the height of the window. One end of each bar is attached to the upper sash, and the other end to the lower sash. Projecting studs are fixed to the outer sides of the sash-stiles, the two for the lower sash being near the bottom rail, and those for the upper near the top rail. These studs slide in grooves in the jambs of the frame. When the sashes are closed, the pivoted bars are in a vertical position, but

when the lower sash is raised they gradually revolve until a horizontal position is attained, forcing the meeting rails apart, and, at the same time, drawing the upper sash down to the same extent as the lower sash is raised from the sill. The lower sash has therefore the appearance of an inward-opening casement, pivoted on the studs near the bottom and the upper sash of an outward-opening casement pivoted on the studs near the top. The length of the pivoted bars or "balances" regulates the extent to which the windows can be opened. An extension arrangement is also fitted in some cases, by means of which a greater opening can be obtained in the upper sash without increasing the length of the balances. Since the invention was introduced into this country the inner sides of the upper stud grooves have been made to take out, so that the upper sash can be turned over for cleaning. The sashes are easily fixed and operated, and do not rattle. They are also said to be thoroughly watertight. The invention is certainly useful.

SWEET'S PATENT CHIMNEY COWL OR VENTILATOR.—We have received two models and a descriptive circular of this invention, but fail to find any particular novelty or merit in it. The shaft is simply a tapering pipe, to the sides of which five smaller tubes (open at the bottom outside and at the top inside) are attached with the idea that the outside air will pass up these tubes and create "a continuous updraught under any conditions" in the main shaft.

TECHNICAL COLLEGE CRAFTSMEN'S SOCIETY, GLASGOW.—A meeting of this Society was held on the 24th ult. in the College, this being the closing meeting of the session when Mr. Alexander Cullen read a paper dealing with the "Decay of Stone," and "Dry Rot in Timber." He insisted on the importance of a proper understanding of the causes of such decay all engaged in the arts and crafts. The chemical structure of stone was explained as being very closely connected with its weathering properties. The germ theory was also touched upon, as opposed to the action of chemical agencies, in being responsible for decay in stone, the lecturer, however, favouring the older belief. The proper seasoning of stone before its introduction into building was held to be essential. Dealing later with "Dry Rot in Timber," the vegetable growth or fungi causing the disease was described in detail, in its origin, its growth, and in its character and appearance, and methods for its prevention and elimination were discussed. Professor Gourlay moved, and Mr. T. L. Watson seconded, a vote of thanks to Mr. Cullen for his valuable contribution to these subjects. A business meeting of the Society was announced for Friday, April 7.

GREEN PARK.—The new pathway which is being made across Green Park from the Victoria Memorial to a point opposite Half Moon-street, Piccadilly, forms a constituent part of the scheme for the approaches to the memorial. It will be 65 ft. wide, and will have a grass border of 15 ft. on either side, and a double avenue of trees is to be planted on each side. It is authoritatively stated that there is no intention of making a carriage road across the Park, whilst some existing footpaths will be turfed over. The cost of the new path, estimated at 4,000l., will be met by Mr. Walter Long's Committee on the Unemployed, and by the Queen Victoria Memorial Committee, aided by future benevolences.

COOK'S HOUSE, WHITBY.—The old house in Grape-lane, Whitby, which bears the name of the great circumnavigator, has been acquired for purposes of the local hospital committee, who propose to devote a part of the building as a museum of relics associated with Captain Cook. The house was his home in the earlier years of his career on board of a collier belonging to Whitby, and for a short period after he had entered the Royal Navy. It bears the date "1688."

LEEDS ARTS CLUB.—Mr. Percy Robinson, of Leeds, gave a lecture before the members of the Leeds Arts Club, on Saturday last week, on "Street Architecture of To-day." The chair was occupied by Mr. A. Waddington. After reference to recent discussion on "Is Leeds Ugly?" which was started by Mr. Bernard Shaw, when he recommended them to burn it down, he touched upon the architecture of various towns, none of which could be considered ideal, not even that of the Metropolis. The development of a town, he contended, lay with the inhabitants, and it lay with them as to whether it developed in a right or wrong direction. There was a lack of appreciation in us as a nation compared with the Continent, and the importance of a well-thought-out and generous treatment of city planning was not realised, or, if realised, was sacrificed for considerations of economy. The chaotic and capricious nature of our architecture of to-day was largely due to the complex factors of

modern life, the varied requirements of the commercial element which cannot be sacrificed in the interests of the purely artistic, and the many restrictions which were imposed upon the architects. Architecture was an expressive art, and every building ought to express its purpose in a straightforward and simple manner; it ought to be invested with a character in harmony with the purpose for which it was to be used. But, at the same time, every building should take its proper place in the general scheme. Referring to the absence of colour in our streets, he pointed out that in Leeds particularly the blackness was due largely to smoke. He thought, however, that we had seen our worst days in that respect, now that there was an increasing tendency towards the consumption of smoke, the adoption of electricity as a motive power, and the decentralisation of factories. Deploping the narrow view taken by municipal authorities in regard to streets, as compared with what prevailed on the Continent, he said he looked upon the Cookridge-street Improvement, Leeds, as anything but a satisfactory line.

A NEW WALL PLUG.—The Clecchio Patent Plug Company send us a specimen of their ingeniously constructed wall plug. This is a cylindrical wooden plug of which the half that is to be inserted in the wall is hollow and slit with four slits so as to be capable of spreading a little, and a conical cork stopper rather larger than the bore is put into it. The plug is inserted in a hole in the wall, and a blow on the outer end of the plug, when it is "home" as far as the cork will allow, drives the cork up to its head in the slit, spreading it into a wedge form which retains the plug in its position. The device is simple and effective. The plug can be obtained from any of the wholesale houses dealing in that class of article.

THE WIDENING OF UNION BRIDGE, ABERDEEN.—A meeting of the Improvement Committee of the Aberdeen Town Council was held recently, when the report of the Burgh Surveyor, dated January 3, relative to the widening of Union-street Bridge, was under consideration. The report gives the probable cost of the widening of the bridge as 14,000l., but in addition to that sum, 1,800l. would be required to make the bridge wide enough to be practically nothing having been done in the direction since the bridge was erected. The committee agreed to recommend that a stop widening should be carried out, and to ask that the matter be remitted back to them with powers to employ a consulting bridge engineer to advise them as to the suitability of the bridge. They will also ask for powers to go on with the work.

WAR MEMORIAL, BURY, LANCS.—A memorial to the officers and men of the Lancashire Fusiliers who fell in the South African war was unveiled recently at Bury by the Earl of Derby. The memorial takes the form of a bronze figure of a Fusilier in the act of cheering for the King, and he holds aloft in his right hand his bushy while in the left is grasped his rifle. On the pedestal of the statue, under the badge of the regiment, is inscribed: "The figure is the work of Mr. George F. R.A."

STREET IMPROVEMENTS, BRADFORD.—A public meeting, Mr. E. H. Toller, President of the Local Government Board, held an inquiry into the Bradford Town Hall into the application of the Bradford City Council for power to put into operation the compulsory powers of the Lands Clauses Consolidation Act, for the acquisition of certain properties required for street improvements. Mr. J. H. Cox, City Surveyor, was the first witness. With regard to Lister Hills-road, Mr. Cox pointed out that the tramway followed the road, which was very narrow in part of its length. The proposal was to continue the widening which had been begun in the lower part. Dealing with the Barkerend-road improvement, he stated that the Corporation had already improved the Church Bank, and the improvement now proposed was, in effect, a continuation of the improvement. So soon as the tramway in Barkerend-road was opened it was most necessary that the street should be widened by a double Peckover-street, and make the street about 18 yds. in width. In Leeds-road there was a short length with a few projecting buildings between Ambury-street and Bow-street. These projections it was proposed to remove. In Northgate there were some projecting buildings, which interfered with the widening of the road, and it was proposed also to take a piece of land, some 24 sq. yds. in area, which was already open to the street, but had which the owners of the adjoining streets had rights, and had exercised these rights by storing carriages upon it. It was proposed to remove the railings in front of the George

Hotel, Market-street, and the small forecourt which narrowed the pavement. At the junction of Little Horton-lane and Manchester-road it was proposed to acquire the property back to the Albert Hotel, and to pull this down and widen the bottle-neck, which was dangerous to tramway and other traffic. In Rebecca-street, which had been already partly widened, there were two or three properties required to complete the scheme. The street at these spots was only 5 yds. in width, and it was proposed to make it 15 yds. In Butcher-street the old North Bierley Urban District Council partially carried out a widening scheme, and the Corporation proposed to carry this forward and complete it. After some discussion the inquiry closed.

BRITISH FIRE PREVENTION COMMITTEE.—The British Fire Prevention Committee's testing arrangements for May include a fire test with Messrs. Pilkington Brothers' horizontal skylights of wire glass in metal and wood frames (first test), and a test with a heavy floor of concrete with broad flange girders, supplied by Messrs. H. J. Skelton & Co. The tests next in rotation are a test with a floor grader, and stanchion coverings, by Messrs. The New Expanded Metal Company (second test); a floor test, by Messrs. Faber, of Berlin; an asbestos brick partition test, by Messrs. The Asbestos Brick and Tile Company (second test); and various minor tests. The next report in preparation for issue is in respect to an automatic fire-alarm system, by the Autophosphor Company, of Copenhagen.

ELECTRIC FIRE-PUMPING PLANT.—An important installation of fire-pumping plant has been put up for Lord St. Levan at St. Michael's Mount, Cornwall. It consists of a set of electrically-driven centrifugal pressure pumps in duplicate, automatic in action, placed in the engine-room, situate about 400 yds. from the castle. An electric storage battery, always charged day and night, will be used, of sufficient size to run either fire pump for one hour; after this time arrangements are made whereby the pumps can be driven continuously from the generating plant. In the castle itself, in convenient positions, will be situated twelve hydrants, each with a long length of hose and nozzle, ready for immediate use; also, in convenient places, nine electric fire-alarm switches. It will only be necessary for any one of these switches to be moved over to start the first set of the electrically-driven fire pumps in the engine-room. The same switch will start electric bells ringing over the other eight switches in the castle, and it will also ring an electric bell in each of the cottages at the bottom of St. Michael's Mount. The fire plant, electric switches, and bells are all in duplicate, and if by chance, therefore, it is found that the first plant is out of order, it will only be necessary for one of the attendants to start one of the other nine switches controlling the other set, when the second set will immediately come into operation. Arrangements have been made whereby two hydrants can be turned on practically to any part of the castle should a fire break out. The work has been carried out by Messrs. Gwynnes Ltd., of London.

NEW CANADIAN CEMENT INDUSTRY.—A leading Toronto financial journal states that arrangements have been completed for the building at Sydney, Cape Breton, of a large plant for making cement from slag, one of the by-products of the Dominion Iron and Steel Company. The plant is to cost about \$250,000, and will be the only one of the kind in Canada. The site has been selected on the steel works. Its capacity will probably be 500 barrels a day, and a co-processor with a capacity of 50,000 barrels a year is also proposed to be built. The plant, which is to be of steel, will probably be finished in July. The City Council of Sydney have granted the Company a bonus of \$10,000, exemption from taxes for twenty years, and low water rates, providing the Company manufacture not less than 25,000 barrels of cement a year.

"A. A." STUDENTS' SMOKING CONVENT.—A concert, organised by the students of the A. A., was held at the Café Monico on Tuesday last, when there was an attendance of about 400 members. Mr. E. Guy Dawber, President, occupied the chair, and a most enjoyable evening was spent. The proceeds, amounting to about 20L, will be paid to the A. A. Building Fund. Amongst those present were Sir Aston Webb, R.A., Messrs. R. Phelan, Messrs. H. T. Hare, W. Howard South-Smith, and many other well-known members. Several high artists contributed to the programme, and Dr. Byrd Page performed some conjuring feats. Mr. F. M. Campbell also assisted with imitations of celebrated actors.

THE SLATE TRADE.—The demand for slates is improving as the season advances, and the treatment between the Welsh, French, and German quarries will help to steady prices. At Llanberis there has been a strike of the

Glynrhonwy men, a quarry hitherto remarkably free from labour troubles. As it was shown that the wages were higher than in most of the neighbouring quarries, and the quarrymen's union refused support, the men are returning to work on the Company's terms.

Legal.

BUILDING OWNER AND ARCHITECT: QUESTION OF THE OWNERSHIP OF DRAWINGS.

The case of *Gibbon v. Pease* came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Mathew and Cozens-Hardy, on the 24th ult., on defendant's appeal from a judgment of Mr. Justice Ridley in the King's Bench Division. (The case was reported in the *Builder* of November 19, 1904.) Mr. Montague Shearman, K.C., Mr. H. T. Kemp, K.C., and Mr. Morie appeared for the appellant, and Mr. Danckwerts, K.C., and Mr. H. Gatehouse for the respondent.

Mr. Shearman, in opening the case, said this was an appeal by the defendant from a judgment of Mr. Justice Ridley, sitting without a jury, in which he found in favour of the plaintiff, ordering the defendant, an architect, to hand over to the plaintiff certain plans and specifications. The action was tried without any evidence being given either on the one side or the other, but the learned judge considered, on the admissions, that a point of law was raised, and, upon the point of law, he thought the plaintiff was right, and he gave judgment for him, his lordship declining to receive some evidence which Mr. Kemp tendered, or was willing to tender, on behalf of the defendant. The point for decision was a short but very important one, it being whether an architect who had a general retainer from the client, the building owner, was entitled, on the conclusion of the business, to retain the plans of the building, or whether the client was entitled to have them. He (counsel) was instructed to argue this question on behalf of the Royal Institute of British Architects, the members of that Institute desiring the decision of this Court on the subject. The evidence which his learned friend, Mr. Kemp, tendered was that of members of the Institute, that a custom existed in the profession that the architect was entitled to keep the plans, but, as he had said before, the learned judge refused to entertain it. The learned counsel then proceeded to state the facts of the case. He said that in September, 1902, the plaintiff, who owned certain houses in Queen's-road, Bayswater, retained the defendant, an architect, to carry out certain work for the conversion of the upper parts of the houses into residential flats, the terms being that defendant should receive for his services 5 per cent. on the contract price. The defendant prepared the plans and specifications, and superintended the work of conversion, which was completed in June, 1903. The plaintiff paid the defendant his fees, and claimed to have the plans and specifications handed over to him, but the defendant alleged that the plaintiff was not entitled to them. The present action was then brought.

Lord Justice Cozens-Hardy asked what would happen, assuming that the defendant's contention was correct, if the building owner wished to discover where the drains were laid?

Mr. Shearman replied that he supposed, in such a case, the building owner could ask the architect for inspection of the plans.

Lord Justice Mathew: Is the architect bound to keep them in safe custody?

Mr. Shearman thought he was. In the present case no question of drains arose. He said it had been pointed out to him that the drain plans were on record, and were deposited with the local authority.

Lord Justice Cozens-Hardy remarked that that would not happen in many country places.

The Master of the Rolls asked what the custom would be if he ordered his portrait to be painted by an artist. He presumed that the artist had been paid his fee, the portrait would pass to him (the Master of the Rolls).

Mr. Shearman replied that in such a case as that the contract entered into would be for goods sold and delivered. The architect's contract was for work and labour. His submission was that the architect's contract was not a contract for selling the plans. Generally, an architect undertook to prepare plans and to see that they were skillfully executed for his employer. No doubt the building owner was entitled to the benefit of the use of the plans, but the pieces of paper on which they were drawn did not belong to him.

Lord Justice Mathew said he could not see what interest the architect had in the plans. Mr. Shearman replied that there was no reason why the architect should not be entitled to make use of the plans in his future

work for other clients. He submitted that all the architect undertook to do was to prepare plans and to see that they were properly and skillfully executed for the client. The contract in the present case was that the architect should receive 5 per cent. on the contract price for preparing the plans, etc., and superintending the work of conversion. He submitted that the moment the alterations were completed the property in the plans remained with the architect.

Lord Justice Mathew: How can you say whether the plans have been carried out or not if you have not got the plans? Is not the employer entitled to have the plans for the purpose of ascertaining whether they have been properly followed or not?

Mr. Shearman: He is entitled, I should say, to inspection of them.

Lord Justice Mathew: Supposing they are lost?

Mr. Shearman: It is the architect's business to take proper care of the plans, no doubt. I think that, for all reasonable purposes, the client is entitled to have the use of the plans.

Lord Justice Mathew: Supposing the architect leaves the country, or fails in health, and dies, is the employer entitled to protect himself from any one of these contingencies, and have the possession of the plans himself?

Mr. Shearman said he did not think they could decide this question in that way. They had found that, in France and Germany, the law was that the architect kept the plans, but was bound to supply the client with one set of drawings.

The Master of the Rolls: Where do you get the obligation on the part of the architect to show the plans to the client?

Mr. Shearman said that would be got as an implied term of the contract of employment. When his learned friend opened the case in the Court below the learned judge said that he was bound by the decision in the case of *Ebdy v. McGowan*, and that, if such a custom as was alleged did exist, it was unreasonable, and that he would not receive evidence in respect to it. He contended that the case of *Ebdy v. McGowan* was distinguishable from the present case.

The learned counsel then read the report of the case of *Ebdy v. McGowan* (2 Hudson on Building Contracts).

The Master of the Rolls said that he thought the same principle was involved in both cases.

Lord Justice Mathew asked if the defendant, at the trial, had called any evidence to prove that such a custom as alleged was reasonable?

Mr. Shearman: The learned judge refused to allow my learned friend, Mr. Kemp, to call any evidence of custom at all.

Lord Justice Mathew said that, in the event of the building owner wanting to bring an action against the builder, it might be most important that the former should have the plans.

The Master of the Rolls observed that if an architect wished to keep the plans, and the building owner agreed to it, it would be easy to provide for that in the contract.

Mr. Shearman said he supposed that if his learned friend, Mr. Danckwerts, made some notes on his brief his client could not insist on having them.

Mr. Danckwerts said he thought the client would be entitled to them.

Lord Justice Mathew: If a client pays him for the brief he would be entitled to the notes, I think.

Continuing his argument, Mr. Shearman said that in the case of a portrait the employer had to have delivery of the picture. The contract between the client and the architect was for certain work to be done, and not that certain plans should be sold. When a man employed an architect to build a house the work he stipulated for was the erection of the house, not the plans from which the house was built. The client had what he bargained for when he got the house built. He submitted that the Court had to look at the engagement, and draw a reasonable inference from the engagement. It seemed to him reasonable that the architect should be entitled to the benefit of his own designs.

Lord Justice Mathew: Entitled to hang them up as ornaments in his drawing-room?

Mr. Shearman said that architects did very often hang them up in their offices. All the contract in the present case was designing and supervising the work until completion for 5 per cent. That being so, the plans which the architect produced for that purpose remained, he contended, the architect's property. The client had all he had stipulated for in having the use of the plans. He contended that the learned judge was wrong in declining to hear evidence as to custom, and that, at any rate, there ought to be a new trial.

Mr. Kemp, in following on the same side, said that the substantial and main object of the architect's employment was to get the houses

converted into flats in accordance with the defendant's design, and the preparation of the plans was a mere incident in order to carry out the intention of the building owner. He submitted that the case of *Ebdy v. McGowan* was clearly distinguishable from the present. In this case the building owner had got all he bargained for, viz., the houses converted into flats according to an approved design, and, in the circumstances, it was impossible to say that such a custom as was alleged was unreasonable, and therefore not good in law. He submitted that the learned judge had no right to shut out the evidence. The defendant was prepared to show that, in the circumstances of this case, there was a custom in the profession that the plans belonged to the architect.

The Master of the Rolls said he thought, in the circumstances of the case, that the learned judge was quite right in refusing to admit the evidence. It was not evidence of custom to tell them what architects thought they ought to have.

Mr. Kemp submitted that the learned judge was wrong in refusing to hear the evidence the defendant tendered.

Without calling upon counsel for the respondent on the appeal, the Master of the Rolls, in giving judgment, said it seemed to him that this case was clearly governed by the principle laid down in *Ebdy v. McGowan*. The defendant was employed by the plaintiff to do all that was necessary to be done by an architect for designing and carrying out a certain building operation at a remuneration of 5 per cent. on the contract price. It was not disputed that the employment involved the preparation of plans, and it was not disputed that the plans were used for the purposes of carrying out the building operations. The price was paid and the building owner claimed the plans. The architect refused to give them up, and contended that, by the custom of the profession, he was entitled to keep them. The matter came to trial before Mr. Justice Ridley, who at once referred to the case of *Ebdy v. McGowan*. Mr. Kemp then stated to the judge that there was a custom in the profession that the architect was entitled to keep the plans after the work was finished. Mr. Justice Ridley held that if the alleged custom existed it was not a custom which could bind the parties. He was not sure that the learned judge was satisfied as to the existence of the custom; but, at any rate, he held, on the authority of *Ebdy v. McGowan*, that it was so unreasonable that the Court would not give effect to it. It was then said that the case was distinguishable from the present. The principle on which Mr. Shearman vested the right of defendant to keep the plans was that the architect's contract was not a contract for the sale of a chattel, but for work and labour, and that the contract was performed when he had superintended the building of the houses. Was that the principle involved in *Ebdy v. McGowan*? In that case the plaintiff was an architect who had been employed by the defendant to prepare plans and get tenders for a vicarage. The payment was to be 5 per cent. on money expended if the vicarage was completed, if tenders were obtained and work not commenced 3 per cent. on the estimated cost, if no invitations for tenders issued 2½ per cent. The plans were prepared, but the defendant changed his mind, and declined to proceed, and wrote to the plaintiff offering to pay and asking for the plans. The architect declined to give up the plans, but sued for payment, and set up a custom among architects to retain their plans if the work was not proceeded with. It was held by the Court of Exchequer that such custom, even if proved, would be unreasonable, and that the defendant need not pay for the plans unless he got them. In his opinion, a custom which transferred the property in a chattel from the person who paid for it to the person who was paid, would be bad. If the custom had been justified in that case it must have been justified on the same contention as that on which it was sought to justify it here. If the custom was bad in the one case it must be equally bad in the other. In the present case the architect had, under his contract, done everything he could be expected to do, and he had been paid everything to which he was entitled. It was clear, therefore, that the plans were the property of the building owner. He thought the contract was to make a chattel, the property in which passed to the building owner who employed the architect to make the chattel and paid him for it. He was of opinion that Mr. Justice Ridley was perfectly right in doing as he had done, and that the case of *Ebdy v. McGowan* was perfectly good law, and ought to be followed. He thought the appeal failed, and ought to be dismissed.

Lord Justice Mathew expressed his entire agreement with the judgment of the Master of the Rolls. He said that the case had been admirably argued by the learned counsel.

Lord Justice Cozens-Hardy also thought that the appeal ought to be dismissed, being of the opinion that the proposition that the architect was entitled to retain the plans could not be maintained. If the architect were allowed to keep the plans, how was the building owner to know where the drain pipes were placed? He could not find out probably without going and making a fresh contract with the architect. Mr. Shearman had had to admit that there would be some sort of an obligation on the architect for the safe custody of the plans, and that admission put another difficulty in his way. In his view the point involved in this case was covered by the decision in *Ebdy v. McGowan*, and that this Court ought to follow the ruling in that case.

The appeal was accordingly dismissed, with costs.

DISPUTE BETWEEN BUILDING-OWNER, BUILDER, AND ARCHITECT.

THE case of *Nye v. Crossley* and another came before the Court of Appeal, composed of Lords Justices Vaughan Williams, Romer, and Stirling, on the 29th ult., on the application of the plaintiff for a stay of proceedings pending the hearing of appeal No. 86 in the Chancery General list.

Mr. Carson, K.C. (with him Mr. Beddall), in support of the application, said that the plaintiff had entered the appeal in question from a judgment of Mr. Justice Warrington. The action was one relating to a building agreement, and the question at issue was who was to be the arbitrator to decide disputes as to prices and so forth under the building agreement. Mr. Crossley was the builder and Mr. Jay, the other defendant, was the architect, and Mr. Crossley maintained that Mr. Jay was the arbitrator. Mr. Nye, the building-owner, said he was not. Mr. Justice Warrington at the trial came to the conclusion that Mr. Jay was the arbitrator, and dismissed Mr. Nye's action with costs. That was to say, his lordship gave judgment for both defendants with costs. That judgment was dated February 6, and on February 22 notice of appeal was given, and on March 6 the appeal was set down. On the same day that the appeal was set down the plaintiff's solicitors wrote to the defendants' solicitors suggesting that the question of costs should stand over pending the hearing of the appeal, but they received a reply that their instructions were to proceed. In the result an application was made to Mr. Justice Warrington to stay execution pending the appeal, but he declined to do so. The plaintiff now came before their lordships by way of original motion. The plaintiff was willing to pay over the costs in the Court before the defendants' solicitors on their undertaking to return them if the appeal proved successful or to pay the taxed costs into Court. He (counsel) submitted that if defendants did not accept either of those courses there ought to be a stay of execution granted pending the hearing of the appeal.

After hearing Mr. Mark Romer in opposition to the application, their lordships ordered a stay of execution pending the appeal if the undertaking to be costs in the appeal.

ACTION AGAINST BUILDERS.

THE case of *Geary, Walker, & Co. v. Lawrence & Son* came before Mr. Justice Kennedy in the King's Bench Division this week.

This was an action by the plaintiffs, wood-flooring, etc., contractors, of 11, Queen Victoria-street, against the defendants, Messrs. Walter Lawrence & Son, building contractors, of Waltham Cross, to recover an amount alleged to be due on a wood-flooring contract.

Mr. Lewis Thomas appeared for the plaintiffs, and Mr. Scott for the defendants.

Mr. Lewis Thomas, in opening the case, said the action was to recover the price of goods sold and delivered, and to work done by the plaintiffs and Town Hall, at Edmonton, for which the defendants had the contract. They agreed with the plaintiffs for the latter to do the wood-flooring, etc., for 1,058*l.* Of this 952*l.* had been paid, and the plaintiffs brought the present action to recover the balance. The contract was dated March 16, 1903. The defendants' contention was that the plaintiffs agreed that the work should be done and the materials supplied to the satisfaction of the architects, and that they would maintain it for a certain period. The defendants further said that, under their own contract with the Edmonton authority, they only received 80 per cent. of the amount due, and that the plaintiffs were subject to the same terms as to money being retained as security for the work being well and properly done. This, however, the plaintiffs denied, and they claimed immediate payment. There was no substantial dispute as to the amount due, but

plaintiffs had not been able to obtain it. Hence the action.

His lordship said he understood the defendants to say that the money was not due when the writ was issued.

Mr. Scott: We say that the action was brought prematurely.

His lordship said that really all the expenses of the action were due to a dispute as to whether the money was actually due at the date of the writ.

Mr. Scott said that the defendants had offered to pay the amount due to the plaintiffs ascertained how much it was under the architect's certificate, and for each party to pay their own costs. The writ was issued in May, and they did not get the certificate until September.

Mr. Lewis Thomas: They retained 20 per cent. and we say they had no right to do so and to put us to the expense of bringing the action.

Mr. Scott argued that defendants could not be called upon to pay the money until they had the certificate that the work was done to the satisfaction of the architect.

After considering the lordship in giving judgment, said it appeared that, after the plaintiffs had done a quantity of Osborn block-flooring, the defendants wrote to them saying that it was only reasonable that they should be bound by the same conditions as to payment as they (the defendants) were, and that 20 per cent. of the money should be retained. This was a reasonable precaution by the contractors for plaintiffs doing this work satisfactorily. He had come to the conclusion that the work was done to the satisfaction of the architect. He was sorry that the parties had not settled the case between themselves. He found, however, that the retention clause did not apply to the plaintiffs, and he gave judgment for them for 88*l.* 15*s.*, with costs.

PATENTS OF THE WEEK.

APPLICATIONS FURNISHED.*

4,671 of 1904—R. W. McDONALD and R. T. BRAMPTON: *Flooring.*

This invention consists of a construction of fireproof floor. Across the space to be covered parallel metal arches are placed, the ends of which are secured to the walls or other supports, the first and last of the series of arches are attached to said walls or other supports by means of bolts or arches next to it. Across the arched surface so formed bars of metal are placed, the ends of which are affixed to each arch, the top bar to the crown of the arches, the bottom bars to the feet. The space between the arches are filled in with any suitable material—brick rubbish with any suitable amount of liquid cement poured over it to give it consistency, but any other suitable material may be employed. A concrete flooring can be placed over the metal arched surface or any other floor that is desired.

5,374 of 1904—J. BLOESBAND: *Electric Gear for Controlling Lifts or Hoists.*

Electric gear for controlling the mechanism of lifts or hoists, the gear comprising switches operated by push buttons or the equivalent so as to make contact whereby the driving mechanism will be started to move the car and the car be caused to stop automatically at any desired point of the lift according to which push button or the like has been operated, and whereby, when one of the push buttons or the like has been operated, all the other push buttons or the like are rendered inoperative until the car has stopped at the place intended by the operation of the push button or the like.

6,690 of 1904—J. BURN: *Electrically-controlled Lifts.*

In a lift controlled by means of push buttons in the cage and on the landings or floor, the use of the cage of a magnet or solenoid, the armature of which, together with a spring, operate a lever so that when the cage is standing in front of a door or gate, it completes a circuit engages, contacts, and completes a circuit through the lock of the door or gate before which the cage is standing, the said lever being drawn back, when the cage is in motion, out of line with the contacts.

8,006 of 1904—A. WHITEHEAD and C. W. TOSH & CO., LTD.: *Tiles.*

This invention relates to tiles for floor walls and other purposes. The tiles, which are made from india-rubber, gutta-percha, or compounds thereof, or of other materials of a like nature, are provided with tongues or grooves, and are so constructed that the tongues and grooves of adjacent tiles are adapted to project from the edges of two tiles.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

engage or interlock so as mutually to prevent each other lifting from the floor or falling away from the wall, as the case may be. The projections and recesses are preferably V or L shaped in cross section, and each tile is provided with both projections and recesses on different sides or edges. For instance, in a square tile the two adjacent sides of the square will be provided with projections, while the other two adjacent sides of the square will be provided with recesses.

3398 of 1904.—S. V. SMITH: *Composition for Applying to Floors, Tiles, Canvas, Floor-cloth, and other surfaces.*

This invention relates to a composition for applying to floors, canvases, tiles, floor-cloths, and other surfaces, preferably after washing, in order to freshen up such surfaces and render them more durable. The composition consists of a mixture of glue, milk, turpentine, and water, and may be made as follows:—1 lb. of glue, one quart of milk, half gall of turpentine, the whole being mixed with half a gallon of water.

6106 of 1904.—LOCKERBIE & WILKINSON, LTD., and R. DUNCAN: *Screw Action Mechanism for Opening and Closing Fanlights, Casements, and the like.*

Screw action mechanism for opening and closing fanlights, casements, and the like, characterised by a pair of wheels which are mounted to gear with each other, and one of which is operated by the handle, while the other is fixed to a screw rod in combination with an operating rod, socketed in a fixed tube, and having a tubular end which contains a tapered nut engaging with the screw rod, whereby the latter is free to telescope into the tubular end of the connected rod.

5377 of 1904.—A. J. BOULT (T. B. Stevens): *Door Latches or Fastenings.*

An automatic latch, comprising a striker for attachment to the door frame, having a plate whose lower end is bent forwardly and is perforated, and having also a forwardly projecting arm, on which is a rearwardly faced shoulder, combined with a case, for attachment to the door, having forwardly projecting ears, and a latching wedge loosely suspended from said ears and having a tail-piece connected with its front side and extending downwardly and rearwardly to a position where it will engage with the striker plate when the door is closed, and having its extreme lower end bent forward and perforated at such a point that the ball of a padlock may pass through such perforation and through a perforation in the lower end of the striker plate.

5808 of 1904.—J. MITCHELL: *Draught and Water Excluders for Doors, and the like.*

A draught and water excluder for doors, and the like, consisting of a board or plate secured to the lower part of a door or casement sash by screws or bolts passing through slots, increasing in length as they are more distant from the hinged side, and actuated by a small wheel when the door or sash is opened.

11222 of 1904.—N. G. SORRESEN: *Manufacture of Boards from Round Timber.*

A method of producing boards from round logs which consists in removing slabs from opposite sides of the log by parallel cuts, slitting the slabs log longitudinally parallel with the slabs faces, for producing a plurality of boards of uniform thickness, and bevelling the edges of said boards uniformly, the bevelling on the two edges of each board having opposite inclinations, and said bevelling following the inclination of the natural bevel curves on the edges of the board.

12125 of 1904.—J. GLOVER: *Apparatus for Grooving Timber.*

This invention relates to apparatus for grooving timber, such as piles, or other wood beams. The invention is designed to provide a portable apparatus which can be readily conveyed to the timber to groove it, instead of having to convey the timber to the mill to be grooved. In carrying the invention into effect, a pair of metallic side plates are provided which are secured together at a given distance apart so that when placed in situ the timber to be grooved will lie between those two plates. Extending transversely between the side plates is a shaft with a saw mounted thereon, and that is driven by means of a handle and counter-shaft, provided with a toothed-wheel gearing into a pinion on the saw shaft. At intervals between the side plates are guide rolls by which the apparatus rests on the timber, and these rolls are adjustable so as to regulate the depth of cut of the saw. In one of the side plates screw pins are provided with plates or anti-friction rollers at the ends, projecting towards the timber, and adapted to keep the apparatus travelling along the timber as the apparatus travels along. These plates or rollers at the ends are spring

controlled, so as to give slightly should they strike any obstruction on the timber, and thus prevent any possibility of their jamming.

13,802 of 1904.—F. ASKMORE and T. H. THOMPSON: *Means or Appliances for Opening and Closing and Fastening Fanlights, Casements, and the like.*

Appliances for opening and closing fanlights, and the like, consisting in the employment, in conjunction with a lever or movable member of the opening mechanism, of a gravitating or spring-actuated catch or locking bolt which—on the fanlight or the like being brought to its closed position automatically engages with a suitable fixture, and thus, by blocking the angular movement of the said lever or member, prevents the fanlight or the like being opened, the releasing or disengagement of the said bolt being effected by the insertion or application of a releasing key, or by a pull cord, or other means.

22,783 of 1904.—F. MAHLER: *Casement Stays or Holders.*

A casement stay or holder, comprising a bracket secured to the window frame, a slotted bar jointed to the bracket, a bracket secured to the window rail, a screw tapped into the latter bracket and engaging in the slot of the bar, a plate through which the screw passes, having notched ends and sliding on the bar, and a flat spring through which the screw passes, having turned-down terminal portions engaging in the notches in the sliding plates.

23,195 of 1904.—G. HEHLING & CO.: *Water-waste Preventers of the Tank-Flush Type for Water-closets.*

Water-waste preventers of the tank-flush type for water-closets, which consists in arranging the lever for operating the starting valve over the siphon and pivoting the same thereon so that the lever, the siphon, and the starting valve constitute a coherent unit, in such a manner that by reversing the position of the siphon the said lever can be shifted to the opposite side of the flushing tank, so that the filling valve with its float can be shifted also to the opposite side of the flush tank without the parts interfering with each other.

26,069 of 1904.—C. E. BATCOCK and P. W. RICKS: *Ventilating Gear for Greenhouses and the like Buildings.*

Ventilating gear for greenhouses and like buildings, comprising an endless band or wire passing over pulleys and running the whole length of the greenhouse or like building, a pivoted lever carried upon an arm attached to the side of the house to which the light is hinged, said pivoted lever being operated by cords or wires passing over pulleys and attached to endless band or wire aforesaid, an inclined bar attached to aforesaid light, upon which a roller attached to aforesaid pivoted lever engages, the whole being operated by a pulley and handle, to which ends of said endless band is attached.

27,882 of 1904.—M. D. HELFRICH: *Water-closet Seats.*

A closet seat, composed of intermediate and side sections of wood extending parallel to each other, with the grain of the wood running lengthwise of each section and parallel in the several sections, and having the central hole, whose walls are formed partially in all of the said sections, transverse openings being formed in front and rear of the hole, and extending through the intermediate sections and into the inner side edges of the side sections, and terminating in recesses formed in the underface of the side sections, arranged at points laterally beyond the side walls of the hole and at points located in from the outer edges of the side sections, the latter being unbroken at their outer edges, bolts in front and rear of the hole and extending transversely the top, and projecting at their ends laterally beyond the side walls of the hole and into the recesses at the ends of the bolt openings, and nuts on the ends of said bolts.

27,991 of 1904.—D. B. WILLIAMS and J. R. STAUFFER: *Manufacture of Fire-bricks, Crucibles, Refractory Substances, and the like.*

A process for treating clays, which consists in first moulding and drying natural clay material, then imbedding the moulded form in an envelope of amorphous coke sealed within a closed chamber, completely surrounding the sealed chamber with an envelope of fuel coke, and finally firing the latter to bring the confined amorphous coke to an incandescent condition and maintaining it in such condition until the clay formed has been converted into the hardened product.

5,309 of 1904.—W. DIECKMANN: *Adjustable Scaffolding.*

An adjustable scaffold, having uprights or supports provided with slots, and with step-like notches or serrations in combination with

transverse timbers adapted to lie in rigid straps suspended in said notches or serrations in such a manner that these straps form a support and also an abutment for the transverse members, so as to prevent displacement of these latter and spreading of the uprights, and to afford relief to the connections for the transverse members.

10,170 of 1904.—B. GRAU: *Manufacture of Cement.*

In the manufacture of cement from fluid blast furnace slag by means of steam, first disintegrating the fluid blast furnace slag into graduated form by means of high-pressure steam in such a way that the mass is blown into a heap, and then allowing it to cool down of itself for the purpose of obtaining the action engendered by its inherent heat, after which the mass either alone or together with a more calcareous cement and cement clinkers may be ground up into an immediately saleable cement powder.

26,931 of 1904.—K. NURNBERGER: *Scaffolding and Staging.*

The method of scaffolding roofs in buildings, bridges, and the like, by means of a travelling cradle suspended by two hangers or holders, characterised by this that one of said holders is replaced temporarily by means of fastening ropes, or the like, and released from its supporting beam, the travelling cradle wheeled or swung round a second fixed holder which serves as a pivot, and thus the cradle is fixed in such second position by again securing the released holder to a beam above the same, whereby, in repeating such operation, a large area may be scaffolded with only a small travelling cradle.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them. Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any communication to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.	
March 15.—By NASH, SON, & ROWLEY (at Royston).	
Ashwell, Herts.—Main rd., an allotment of freehold land, 21 a. 0 r. 16 p., y.r. 18s.	£710
March 16.—By ALEX. MOSSMAN (at Uxbridge).	
Buislip, Middlesex.—The Common, "The Ferns," &c., a.r. 35s.	525
Reservoir rd., enclosure of building land, 2 a. 2 r. 32 p., &c.	450
March 18.—By TUCKETT & SONS (at Rayleigh).	
Rayleigh, Essex.—High-st., a residence, &c., y.r. 18s.	295
High-st., shop, two cottages, and reading room, &c., y.r. 36s.	510
Back-ls., a freehold cottage, y.r. 6s.	120
Spratts Green, "Cooches" enclosures, 16 acres, &c.	450
Thundersley, Essex.—Three cophold cottages, y.r. 18s.	240
Cottage and 4 a. 0 r. 30 p., &c.	136
A freehold cottage, y.r. 5s.	160
South Benfleet, Essex.—Two cophold cottages, y.r. 8s.	205
A freehold cottage, y.r. 5s.	100
By SPELMAN (at Norwich).	
Overstrand, Norfolk.—The Overstrand Hotel, &c.	7,500
March 20.—By KING & CHASEMORE.	
Nutbourne, Sussex.—"Nutbourne-pl." and 2½ acres, &c.	1,900
Maresfield, Sussex.—"Whitehouse Cottages" (two) and 1 a. 2 r. 14 p., &c.	420
By REYNOLDS & BASON.	
Hackney.—55 to 64 (even), Victoria Park-rd., ut. 49 yrs. &c. 28s. y.r. 22s. 19s.	2,050
Whitechapel.—9, St. Mark's-st. (e.), &c., y.r. 55s.	1,100
Lincoln.—Salmon-ls., f.g.r. 12s. 12s., reversion in 94 yrs.	290
Commercial-road East.—No. 757 (n.), &c., y.r. 35s.	46
By WILKINSON, SON, & WELCH (at Brighton).	
Brighton.—Gloucester-rd., "The Wick Inn," a freehold rental of 57s. reversion in 3 yrs.	1,300
28 and 29, Foundry-st., &c., w.r. 41s. 12s.	465

March 23.—By FURBERS'.
 Paddington.—Alfred-rd., l.g. rents 183*l.* 10*s.*,
 reversion in 43 and 46 yrs. 24*l.*95
 Brindley-st., l.g. rents 250*l.*, reversion in 40
 yrs. 6*l.*15
 By NEWBORN, EDWARDS, & SHEPHARD.
 Stroud Green.—43, Connaught-rd., u.t. 71*l.*
 yrs., g.r. 7*l.* 10*s.*, y.t. 42*l.* 415
 By VESTON, BOLL, & CO., 15, Abchurch-lane.
 Cricklewood.—53, Elm-st., g.r. 15*l.*, Chichester-rd., u.t.
 88 yrs., g.r. 22*l.* 18*s.*, y.t. 165*l.* 1,515
 22 to 28 (even), Ash-gt., u.t. 74 yrs., g.r.
 23*l.* 2*s.*, y.t. 165*l.* 1,310
 By SAMSON & SONS.
 Vauxhall.—to 7, Loughborough-st., c. w.r.
 240*l.* 12*s.* 1,870
 6 and 7, Leopold-st., u.t. 56*l.* yrs., g.r. 10*l.*,
 w.r. 4*s.* 1,485
 Bernondsey.—29 to 37 (odd), Yalding-rd.,
 u.t. 80 yrs., g.r. 26*l.*, w.r. 162*l.* 14*s.* 760
 Norwood.—125 to 131 (odd), Kingsland-rd., u.t.
 145 yrs., g.r. 15*l.*, w.r. 135*l.* 4*s.* 830
 New Kent-road.—70 and 71, Great Brand-st.,
 f. w.r. 66*l.* 6*s.* 695
 Marlow, Bucks.—Holland-rd., f. w.r. 24*l.*
 1, y.t. 24*l.* 23*l.*
 March 24.—By W.M. HOLLIS.
 Finchley.—Nether-st., "Netherbrook," f. w.r. 1,200
 100*l.* 675
 3, Tessa-gt., f. w.r. 500 500
 Cresswell.—Netherley, f. w.r. 50*l.* 50*l.*
Contractions used in these lists.—F.g.r. for freehold
 ground-rent; l.g.r. for leasehold ground-rent; l.g.r. for
 improved ground-rent; s.g.r. for ground-rent; r. for rent;
 p. for purchase; e.r. for estimated rental; w.r. for weekly
 rental; q.r. for quarterly rental; y.r. for yearly rental;
 u.t. for unexpired term; c. for copyhold; s.t. for steam; y.s. for
 years; l. for lane; s. for street; rd. for road; sq. for
 square; pl. for place; ter. for terrace; cres. for crescent;
 av. for avenue; gds. for gardens; yd. for yard; g. for
 grove; b.h. for bus-house; p.h. for public-house; c. for
 offices; a. for shops; ct. for court.

MEETINGS.

FRIDAY, MARCH 31.
Institution of Mechanical Engineers.—An extra meet-
 ing, when the "First Report to the Steam-Engine
 Research Committee," by Professor David S. Capper,
 will be further discussed. 8 p.m.
 SATURDAY, APRIL 1.
Illustrated British Institution of Certified Carpenters.—
 Mr. S. B. Savill on "The Report of the Committee on
 Wrecks by Line-light views." 6.15 p.m.
Royal Institution.—Right Hon. Lord Rayleigh on
 "Some Controverted Questions of Optics," II. 5 p.m.
 MONDAY, APRIL 3.
Royal Institute of Civil Architects.—Papers on "The
 Planning of Cities and Public Spaces," by Mr. John W.
 Simpson and Professor Beresford Pite, with lantern
 illustrations. 8 p.m.
London Architectural Society.—Annual General
 Meeting. 6 p.m.
Society of Engineers.—Mr. W. Pollard Digby on
 "Statistics of British and American Rolling Stock."
 7.15 p.m.
Society of Arts (Lamartine Lecture).—Mr. H. Laws Webb
 on "Telephony." IV. 8 p.m.
 TUESDAY, APRIL 4.
Builders' Clerks' Association.—Institution.—Twenty-
 second Annual Dinner, King's Hall, Holborn Restaurant.
 6 p.m.
Institution of Civil Engineers.—Mr. C. S. Russell
 Palmer on "Coolidge Water Supply." 8 p.m.
 WEDNESDAY, APRIL 5.
Royal Architectural Association.—Mr. R. P. Brereton
 M.A., on "Barnes Church Towers: their Character-
 istics and Classification," illustrated by lantern examples
 4 p.m.
Building's Foremen and Clerks of Works' Institution.—
 Ordinary Meeting of the Members. 8 p.m.
Society of Arts.—Mr. R. N. Hall on "Ancient
 Architecture of the Great Zimbabue." 8 p.m.
Institution of Surveyors Engineers.—Election Com-
 mittee. 8 p.m. Examination and Literary Committee
 5 p.m.
 THURSDAY, APRIL 6.
Society of Antiquaries.—8.30 p.m.
Royal Institution.—Professor R. Meldola, F.R.S., on
 "Synthetic Chemistry," experimental. II. 5 p.m.
Technical Institution.—Lecture—"A Visit to the
 Waltham Power-house of the North Metropolitan
 Electric Power Supply Co., Taylor's Lane, Willesden."
Institution of Electrical Engineers.—Discussion on
 "The Council of the Institution," by Prof. J. A. Ascoli,
 St. Louis, by Mr. W. Duddell, Member, Hon. Secretary to the
 Delegation to the Congress; and the Papers of
 "Systems of Electric Units," by Prof. J. A. Ascoli,
 St. Louis, by Mr. W. Patterson, and Dr. F. A. Wolff. 8 p.m.
Society for the Encouragement of Fine Arts.—Mr.
 Philip H. Remond on "The Art of the Spanish School of
 Spanish Tour" (lantern illustrations). 8 p.m.
 FRIDAY, APRIL 7.
Architectural Association.—Mr. H. Phillips Fletcher
 on "The Buildings of the World's Fair, St. Louis
 Exhibition, 1904." 7.30 p.m.
Institution of Surveyors.—Mr. Alfred Moseley, C.M.G.,
 "American Industry." 9 p.m.
Institution of Civil Engineers (Students' Meetings).—
 Papers to be read on "The Design for Dock Use,"
 by Mr. C. Clark; (2) "Bath Corporation Waterworks
 Extension," by Mr. J. R. Fox. 8 p.m.
Society of Engineers (Westminster Palace Hotel).—
 Mr. George H. Hughes on "Water Works Construction
 in America." 8 p.m.
 SATURDAY, APRIL 8.
Royal Institution.—The Right Hon. Lord Rayleigh
 on "Some Controverted Questions of Optics," II. 3 p.m.
Royal Sanitary Institute.—A Provincial Sectional
 Meeting, to be held at Civil-court, Small-street, Bristol,
 when a Discussion will be held on "Toilet Use," by
 Messrs. T. and J. D. Discussion will be opened by Dr. D.
 Davies and Mr. T. H. Yabbison, Civil Engineer &
 Surveyor. The Chair will be taken at 11 a.m. by Mr.
 Whitaker, A.R.S., F.R.S., F.G.S. (Chairman of Council
 for the Year).

	BRICKS, &c.	
Hard Stocks.....	1 12 0 per 1000 alongside, in river,	
Rough Stocks and Grizzlies.....	1 8 0 " " "	
Facing Stocks.....	2 5 0 " " "	
Shippers.....	2 5 0 " " "	
Fletions.....	1 8 0 " " at railway depot,	
Best Blue Dressed	3 12 0 " " "	
Best Farnham Red	1 14 0 " " "	
Best Red Pressed	" " " "	
Bushon Facing	5 0 0 " " "	
Best Blue Pressed	" " " "	
Staffordshire.....	4 4 0 " " "	
Do. Bullnose.....	4 10 0 " " "	
Best Scourbridge	" " " "	
Fire Bricks.....	4 8 0 " " "	
GLAZED BRICKS.		
Best White and		
Ivory Glazed		
Stretchers.....	12 0 0 " " "	
Headers.....	11 0 0 " " "	
Quoins, Bullnose, and Flats.....	12 0 0 " " "	
Double Stretchers	19 0 0 " " "	
Double Headers..	16 0 0 " " "	
One Side and two		
Ends.....	19 0 0 " " "	
Two Sides and		
one End.....	20 0 0 " " "	
Splays, Cham- ferred, Squints	20 0 0 " " "	
Best Dipped Salt		
Glazed Stretch- ers, and Header	12 0 0 " " "	
Quoins, Bullnose, and Flats.....	14 0 0 " " "	
Double Stretchers	15 0 0 " " "	
Double Headers..	14 0 0 " " "	
One Side and two		
Ends.....	15 0 0 " " "	
Two Sides and		
one End.....	15 0 0 " " "	
Splays, Cham- ferred, Squints	14 0 0 " " "	
Second Quality		
White and		
Dipped Salt		
Glazed.....	2 0 0 " less than best.	
Thames and Pit Sand.....	s. d. 7 0 per yard, delivered.	
Thames Ballast.....	5 8 " per ton,	
Best Portland Cement	27 0 " per ton,	
Best Ground Blue Lias Lime	20 0 " "	
NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.		
Grey Stone Lime.....	15s. 6d. per yard, delivered.	
Scourbridge Fireclay in sacks	27s. 6d. per ton at r.a.c.	
STONE.		
BATH STONE—delivered on road waggons, Paddington Depot.....	a. d. 1 6½ per ft. cube,	
Do. do. delivered on road waggons, Paddington Depot.....	1 8½ " "	
PORTLAND STONE (20 ft. average).		
Brown Whitbed, delivered on road waggons, Paddington Depot, Nine Elms depot, or Fulham Wharf.....	2 1 " "	
White Bashed, delivered on road waggons, Paddington Depot, Nine Elms depot, or Fulham Wharf.....	2 2½ " "	
ANCIENT IN BLOCKS.....		
Ancaster in blocks.....	1 1 per ft. cube, daily rate, deliv.	
Beor ".....	" " "	
Greenhall ".....	" " "	
Decker Dale in blocks.....	3 4 " "	
Red Corseshill.....	2 5 " "	
Cloosburn Red Freestone	3 4 " "	
Bed Mansfield.....	" " "	
YORK STONE.—Robin Hood Quality.		
Scrapped random blocks 2' 10"		
6 in. sawn two sides landings to sizes (under 40 ft. super).....	2 3 per ft. super.	
ditto, ditto.....	2 6 " "	
3 in. sawn two sides slabs (random size).....	0 11½ " "	
2 in. to 2½ in. sawn one side slabs (random size).....	0 7½ " "	
1½ in. ditto, ditto.....	6 8 " "	
HARD YORK.		
Scrapped random blocks 3' 0" port. cube.		
6 in. sawn two sides landings to sizes (under 40 ft. super).....	2 8 per ft. super.	
ditto.....	3 0 " "	
3 in. sawn two sides slabs (random size).....	1 8 " "	
2 in. self-banded random flags.....	0 5 " "	
Hopton Wood (Hard Bed) in blocks 3' 0" port. cube, daily rate, deliv.		
".....	6 in. sawn both sides landings to sizes (under 40 ft. super).....	2 7 per ft. super.
".....	3 in. do.	1 2½ " "
SLATES.		
in. in.	2 s. d. 4 per 1000 of 12x20 in.	
20 x 10 best blue Bangor 13	17 6 " "	
20 x 13 ".....	18 0 " "	
20 x 10 first quality ".....	18 0 " "	
20 x 12 ".....	14 15 0 " "	
16 x 8 ".....	7 5 0 " "	
20 x 10 best blue Portmadoc.....	12 18 6 " "	
16 x 8 ".....	6 12 6 " "	

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

Nature of Work.	By whom Required.	Prominence.	Dates to be Delivered.
*Plans for Orphanage at Harrogate	Rev. J. T. Barkby	Not stated	May 31

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Chapel, Laboratories, Lecture Hall, etc., St. Bees Sch. Filter Bed, Boultham Pumping Station	Lincoln Corporation	J. F. Curwen, F.S.A., Architect, Kendal	April 1
Fire Appliances	Todmorden Guardians	Waterworks Office, Silver-street, Lincoln	do
Temporary School, etc., Beech-street, Winton	Eccles Corporation	F. Hollarake, Clerk, Union Offices, Todmorden	do
Materials and Works	Teddington U.D.C.	E. Parkes, Town Clerk, Town Hall, Eccles	do
300 yds. of Destructor Chinker	Chingford U.D.C.	H. Bird, Clerk, 34, Station-road, Chingford	do
450-gallon Street Watering-Van	Farnborough U.D.C.	J. E. Hargreaves, Surveyor, Farnborough	April 4
Extension of Town Hall (1st section)	Bradford Corporation	F. E. P. Edwards, City Arch., Whitaker-bldgs., Brewery-st., Bradford	do
Materials	Dundee Gas Commissioners	A. Tuill, Engineer, Gas Works, Dundee	do
West-street School	East and West Molesey U.D.C.	D. Cann, Council Offices, Dundee Villa, St. Mary's-rd., E. Molesey	do
Paving Works, Edgeware-road	Middlesex C.C.	H. T. Waklam, County Engineer, Middx. Guildhall, Westminster	do
Wrought-Iron Material	Bombay, Baroda, & Cent. Ind. Ry. Co.	T. W. Wood, Sec., Gloucester Ho., Bishopsgate-st. Withou, E.C.	do
Hauling Stone and Material	Bredwardine R.D.C.	Surveyor, 46, St. Andrew's-road, Portlady-by-Sea	do
Flints	Portlady-by-Sea U.D.C.	Holgate & Spivey, Architects, Colne	do
Restoration of Knockando Church	Colne Education Department	J. Robertson, Architect, Inverness	April 1
Bowling Green, etc.	Carlisle Corporation	H. G. Marks, City Engineer, 38, Fisher-street, Carlisle	do
Pavilion, etc.	do	do	do
Two Lancashire Steam Boilers	Rochdale Gas, etc., Committee	T. Banbury Ball, Gas Works, Rochdale	do
Road and Sewer, Ballif Bridge	do	J. F. Walsh & G. Nicholas, Architects, Museum-chambers, Halifax	do
Six Terrace Houses, Ballif Bridge	do	do	do
Pair of Semi-detached Houses, Ballif Bridge	Morley Corporation	W. E. Putman, Borough Engineer, Town Hall, Morley	do
Materials	Rochford R.D.C.	C. W. Young, Secretary, Nicholas-lane, E.C.	do
Road Materials	East India Railway Co.	W. Holloway, Clerk to Parish Council, Tadcaster	do
Steel Plates, Flies, etc., etc.	Rathdown Guardians	P. Cunningham, Clerk, Longhinstown, Ireland	do
Iron Watercart with Sprayer	New Sarum Town Council	F. Holding, Town Clerk, Municipal Offices, Salisbury	do
Plumbing Work, Workhouse Premises, etc.	Devonport Guardians	A. Gard, 19, St. Aubyn-street, Devonport	do
Cornish Boiler at Waterworks, Wyndham-road	Thingoe R.D.C.	A. R. Cameron, Surveyor, Mill-lane, Bury St. Edmunds	do
Furniture for Infirmary	Waltham Holy Cross U.D.C.	W. Turner-treacher, Surveyor, Town Hall, Waltham Abbey	do
6,000 tons of Granite	Bognor U.D.C.	C. Gamble, Vicar, Pease-down St. John, near Bath	April 1
Making-up Eastbrook-road	Fallsforth U.D.C.	O. A. Bridges, Town Surveyor, Bognor	do
North Aisle, St. John's Church, Pease-down St. John	Whiston R.D.C.	G. F. Gray, Surveyor, Council Offices, Fallowfield	do
Road Repairing Material	Ormeau Guardians	R. J. Knapman, C.E., Surveyor, Delph-lane Office, Whiston	do
Cast-iron Pipes, Valves, etc., for Filter, Green-lane	Southend-on-Sea Corporation	G. R. Peers, Electrical Engineer, 18, John Dalton-st., Manchester	do
Carting Road Material	Ilkeston Corporation	E. J. Elford, Borough Engineer, Southend-on-Sea	do
Road Material	Manchester Joint Workhouse Com.	H. J. Kilford, Borough Engineer, Town Hall, Ilkeston	do
Two Electric Motors	Cheadle and Gatley U.D.C.	J. Murgatroyd, Architect, 23, Stratford-st., Manchester	April 1
Making-up Streets	Whickham U.D.C.	E. Sykes, Surveyor, 9, High-street, Cheadle, near Manchester	do
Police Station, etc., Wharncliffe-road, Ilkeston	Messrs. Woodley & Co.	T. Lambert, Clerk, Town Hall, Gateshead	do
Extension of Female Casuals' Washhouse, Tame-st., Ancoats	Worsley U.D.C.	W. Ross, High-street, Cymmer	do
Materials	S.E. and Chatham Railway Co.	J. Wood & J. B. Gaskell, Architects, Milford Haven	do
Road Metal	Dewsbury Corporation	W. C. Beld, Architect, Eddon	do
Extensions, etc., Baptist Church, Plagah, Cymmer	Education Com., East Riding of York	J. A. Corson, Surveyor, District Office, Miln-lane, Walsden	April 1
Shop, Charles-street, Milford Haven	Bytling R.D.C.	Superintendent of Stores, 84, Tooley-street, London, S.E.	do
New Church, Elgin	Man-hewer Education Committee	H. Ellis, Town Clerk, Dewsbury	do
Materials	Gallagher and Rhigos R.D.C.	Clerk of Works, Beverly	do
Minister's Residence, Moretonhamstead, Devon	Albion Room and Power Co.	J. Young, Clerk of Justice	do
Stores	Brighton Corporation	H. A. Mullens, Union Offices, Bulcamp, Halesworth	April 1
Disinfectants	District Com., Middle Ward, Lanark	Education Office, Deal-gate, Manchester	do
Alterations, etc., Council School, Bromfield	Chester-le-Street R.D.C.	J. P. Ashton, Clerk, 71, High-street, Runcorn	do
Steam Pipe Cover, District Asylum, Ballinacree	Education Committee	S. Keighley, 27, Nicholas-street, Burnley	do
Granite	Dover Town Council	H. Talbot, Town Clerk, Town Hall, Brighton	do
Alterations, etc., Embury-st., Municipal School, Hulme	Glasgow Corporation	F. H. Douglas, District Engineer, District Office, Hamilton	do
Mortuary, Weston Point	Hendon U.D.C.	Mr. Williams, Architect, Bedford	do
Weaving Shed, Warehouse, etc., Dryden-st., Redham	Great Western Railway Co.	G. W. Ayton, Highway Surveyor, Chester-le-Street	do
Serpic Tank Installation, Southwick	do	J. C. Mount, Borough Surveyor, Lancaster	do
Barraclough Sewer (Mount Vernon Drainage)	do	W. Knocker, Town Clerk, Castle Hill House, Dover	do
Eighteen Houses, Redding	Glasgow Corporation	J. Dalrymple, 46, Bath-street, Glasgow	do
Road Metal and Carting	Glasgow Corporation	Council's Engineer and Surveyor, The Burroughs, Hendon, N.W.	do
Mixed School, Greaves, Lancaster	Glasgow Corporation	do	April 11
Road Materials	Glasgow Corporation	do	do
Alterations to Dennytown Depot	Glasgow Corporation	do	do
*Provid., etc., about 200 yds. 2-in. C.I. Pipes in the Park	Glasgow Corporation	do	do
*100 to 200 tons of Portland Cement	Glasgow Corporation	do	do
Staircase and Covered-way at Brentford	Glasgow Corporation	do	do
Covering for Crane at Hayes	Glasgow Corporation	do	do
Two Footbridges (Freshford and Panteg)	Glasgow Corporation	do	do
21 miles of Widening Line, Olton to Bordesley	Glasgow Corporation	do	do
Sewer No. 3, 2,000 lineal yds.	Glasgow Corporation	do	do
Street Making and Sewering (Rose-terrace, etc.)	Glasgow Corporation	do	do
200 lineal yds. of Sanitary Pipe Sewers, Ponteland	Glasgow Corporation	do	do
Stoneware Pipes	Glasgow Corporation	do	do
*Extension of School, Ilford	Glasgow Corporation	do	do
Bank, Baitley	Glasgow Corporation	do	do
Brick Chimney, North Brickworks, Elland	Glasgow Corporation	do	do
Road Materials	Glasgow Corporation	do	do
Alterations, Amos Infants School, Abernethy-st., Canton	Glasgow Corporation	do	do
Artisan's Dwellings, Wellington-street, Canton	Glasgow Corporation	do	do
Gateside Sewer	Glasgow Corporation	do	do
Chudleigh Knighton Water Supply	Glasgow Corporation	do	do
Annual Contracts	Glasgow Corporation	do	do
Soakaway Drain Pipes	Glasgow Corporation	do	do
Road Materials	Glasgow Corporation	do	do
*Making up Rostrevor-mews Approach	Glasgow Corporation	do	do
*Tarran Wood Paving	Glasgow Corporation	do	do
Painting, Armlay and Oak Road	Glasgow Corporation	do	do
Painting, Hunslet Lake, Holbeck Moor, and Farnley	Glasgow Corporation	do	do
Painting, Bramley and Stanningley	Glasgow Corporation	do	do
Police Station, Llanharan	Glasgow Corporation	do	do
18-in. Main Sewer, Sewer Diversion, Road, etc.	Glasgow Corporation	do	do
Tar Macadam	Glasgow Corporation	do	do
*Special Schools on Clifton-avenue and Sile	Glasgow Corporation	do	do
Super-structures: Casual Works, Labour Sheds, etc.	Glasgow Corporation	do	do
Stores	Glasgow Corporation	do	do
Road Materials, Cartage	Glasgow Corporation	do	do
Jobbing Work	Glasgow Corporation	do	do
Rolling and Superheating Apparatus for Elec. Pwr. Plant	Glasgow Corporation	do	do
Bow-wall Centre-ladder Self-propelling Driveler	Glasgow Corporation	do	do
Congregational Church, Pen-y-darren, Merthyr Tydfil	Glasgow Corporation	do	do

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered
Paving Boundary	Leeds Corporation	City Engineer's Office, Leeds	April 17
Footpath Way Construction and Paving	Batley Corporation	Lacey, Sillar, & Leigh, 2, Queen Anne's-gate, Westminster	do.
Overhead Equipment, Steel Poles, etc.	do.	do.	do.
Power Cables, Conduits, and Accessories	do.	do.	do.
Office Office, Leeds	East Sussex C.C.	F. J. Wood, County Surveyor, Lewes	do.
Office of Public Library	Erith U.D.C.	W. Egerton, Architect, 12, Queen's-road, Erith	do.
Underground Waterworks (Reservoir, etc.)	Llantrisant & Llanwit Fadre R.D.C.	Gomer S. Morgan, Engineer, School-street, Pontycau	April 18
Underground Waterworks (3,500 lineal yds. of pipes)	do.	do.	do.
Waterworks for S. and W. Horrington, Out St. Cuthbert	Wells R.D.C.	A. G. Russ, Poor Law Offices, High-street, Wells	do.
High-level Aqueduct (Waterworks)	Merthyr Tydfil U.D.C.	G. F. Deacon, 16, Great George-street, Westminster, S.W.	do.
Fifty Houses, Brewery-st., Pontygarth	Penrhy's Isaf Building Co., Ltd.	E. Davies, 8, Madeline-street, Pontygarth	do.
Gas	do.	do.	do.
Gas	do.	do.	do.
Materials and Team Labour	Mitcham & Wimbledon Dist. Gas Co.	Offices of the Works	do.
Gas	Rutland C.C.	B. A. Adam, Clerk, Oakham	April 20
Gas	Houghton-le-Spring R.D.C.	D. Balfour, Engineer, Houghton-le-Spring, R.S.O.	do.
Apparatus for Teaching Mechanical, etc., Laboratories	Plymouth Education Authority	E. Chandler Cook, Education Secretary, 13, Prince's-sq., Plymouth	April 26
New Cane and Widening, Throesie Nest, Manchester	Cheshire Lines Committee	H. Blundell, Engineer, Central Station, Liverpool	April 27
Construction of Public Library	Borough of Southend-on-Sea	Town Clerk, Town Clerk's Office, Southend-on-Sea	do.
General Laundry, Bolter-House, etc., at Workhouse	Boston Guardians	J. M. Simpson, Clerk, 23, Wide-bargate, Boston	April 29
Three Infirmary Buildings	do.	do.	do.
Three Infirmary Buildings	Bishop's Stortford U.D.C.	T. Swatheridge, Clerk, Council Offices, Bishop's Stortford	May 8
Three Infirmary Buildings	do.	do.	do.
Three Infirmary Buildings	do.	do.	do.
Three Infirmary Buildings	Municipal Council, Sydney, N.S.W.	Acting Agent-General, Victoria-street, Westminster, S.W.	May 30
Three Infirmary Buildings	Sec. of Pub. Wks., Sydney, Australia	Agent-General's Office, 9, Victoria-street, London, S.W.	Sept. 1
Three Infirmary Buildings	do.	J. E. Knight, Architect, 33, College-street, Rotherham	No date
Three Infirmary Buildings	do.	Tollett & Lee, Architects, 7, St. Aldgate's, Oxford	do.
Three Infirmary Buildings	The Managers	A. Pells, F.S.I., Architect, Beccles	do.
Three Infirmary Buildings	do.	C. Ling, Devonshire-street, Carlisle	do.
Three Infirmary Buildings	Southwold Corporation	Borough Surveyor, Town Hall, Southwold	do.
Three Infirmary Buildings	The Committee	J. Wills & Sons, Architects, Victoria-chambers, Derby	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
Clerk of Works	Tottenham U.D.C.	47. per week	April 12
Clerk of Works	Middleton Corporation	37. per week	April 15

Those marked with an (*) are advertised in this number.

Competitions, iv.

Contracts, iv. vi. viii. x.

Public Appointments, xx.

TENDERS.—Continued from page 363.

CARDIFF.—For forming and metalling, etc., the carriageway, Swansea-street, Menelaus-street, Bridgend-street, and Moorland-road, for the Corporation. Mr. W. Harpur, Borough Engineer, Town Hall, Cardiff:—

	Swansea-street.	Bridgend-street.	Moorland-road.	Menelaus-street.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
J. H. Dickson	1,424 18 0	61 0 2	185 15 0	211 18 0
X. H. Dickson	1,060 4 8*	47 0 8*	160 12 9	198 6 9
T. A. Williams, Cardiff	1,081 13 3	49 13 9	151 13 7*	133 8 3*

HENDON.—For granite chippings, for the Urban District Council:—

	Midland Railway.	G.N.R.
	Gauge.	Mill Hill Hendon C' Wood Mill Hill

	Perton	Perton	Perton	Perton
	a. d.	a. d.	a. d.	a. d.
J. H. Dickson	14 0 14	14 0 14	14 0 14	14 0 14
J. H. Dickson	13 9 13	13 9 13	13 9 13	13 9 13
J. H. Dickson	13 6 13	13 6 13	13 6 13	13 6 13
J. H. Dickson	16 9 16	16 9 16	16 9 16	16 9 16
J. H. Dickson	9 8 9	9 8 9	9 8 9	9 8 9
J. H. Dickson	9 2 9	9 2 9	9 2 9	9 2 9
J. H. Dickson	8 5 8	8 5 8	8 5 8	8 5 8
J. H. Dickson	10 8 11	10 8 11	10 8 11	10 8 11
J. H. Dickson	3 8 3	3 8 3	3 8 3	3 8 3
J. H. Dickson	8 9 8	8 9 8	8 9 8	8 9 8
J. H. Dickson	7 9 7	7 9 7	7 9 7	7 9 7
J. H. Dickson	8 9 8	8 9 8	8 9 8	8 9 8
J. H. Dickson	7 6 7	7 6 7	7 6 7	7 6 7
J. H. Dickson	8 0 8	8 0 8	8 0 8	8 0 8
J. H. Dickson	8 0 8	8 0 8	8 0 8	8 0 8
J. H. Dickson	9 0 9	9 0 9	9 0 9	9 0 9
J. H. Dickson	8 0 8	8 0 8	8 0 8	8 0 8
J. H. Dickson	11 6 11	11 6 11	11 6 11	11 6 11
J. H. Dickson	12 6 12	12 6 12	12 6 12	12 6 12

WALSLEY.—For the extension of the East Pier, at the Town Council.

C Broad & Son, 65, Rensfield-street, Glasgow

£25,991 19 7

LEICESTER.—For erecting a manager's house and boundary-wall at the new pumping-station at Belgrave, Leicestershire, for the Corporation. Mr. E. G. W. Adams, Borough Engineer, Town Hall, Leicester:—

£1,510 9 11

H. A. K. & Co., Ltd.

£1,340 0 0

£1,280 0 0

£1,168 0 0

£1,154 9 3

£1,154 0 0

£1,122 10 0

£1,114 8 0

£1,085 15 4

£1,075 0 0

£1,061 13 5

LLANDAFF.—For the first section of St. Michael's Theological College, Llandaff, for the Council of the College. Mr. Kempen, architect. Quantities by Mr. Charles Taylor, Hereford and Cardiff:—

Broad & Co., £11,006 0 0

Stevens & Co., £9,411 0 0

Bastow, £10,997 0 0

D. Davies, £10,973 0 0

Shepton, £9,445 0 0

Estcourt & Co., £9,800 0 0

W. Thomas, £9,633 0 0

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Bastow, £10,997 0 0

D. Davies, £10,973 0 0

Shepton, £9,445 0 0

Estcourt & Co., £9,800 0 0

W. Thomas, £9,633 0 0

Clapham, Larkhall-lane (Improvements).

W. J. Mitchell & Son	£15,798	F. & H. F. Higgs	£14,458
Lathey Bros.	16,519	J. Garrett & Son	14,383
W. Smith & Son	16,074	Stimpson & Co.	14,300
Spencer, Santo, & Co., Ltd.	14,988	J. Smith & Sons, Ltd.	14,250
J. & C. Bowyer	14,974	Holliday & Green-wood, Ltd.	14,078
W. King & Son	14,800	J. Appleby & Sons	13,700
Holloway Bros. (London), Ltd.	14,786	Hudson Bros.	13,609
J. Carmichael	14,681	W. Johnson & Co., Ltd.	13,609
J. Marsland & Sons	14,579	Ltd., Belvedere-road, Wandsworth	13,205
J. & M. Patrick	14,551	worth Common	13,205
J. Simpson & Son	14,545		

† Recommended for acceptance.
[The architect's estimate comparable with these tenders is 14,494.]

LONDON.—For Shepherd's Bush Sorting Office:—

	Credit Old Material.
J. Haydon & Sons	£4,860 0
Fowler & Co.	2,704 0
W. J. King	2,640 0
Matlock & Parsons	2,593 0
Snowin Bros. & Co.	2,590 0
W. Willett	2,580 0
Prestige & Co.	2,554 0
G. Neal	2,549 0
T. Mills & Son	2,535 0
A. Woods	2,500 0
Leslie & Co., Ltd.	2,497 0
G. Parker	2,475 0
W. J. Dickson	2,460 0
C. Ansell	2,452 0
W. Taylor & Co.	2,450 0
H. Kent	2,449 0
F. & A. Willmott	2,429 0
J. Garrett & Son	2,422 0
Speckley & Smith	2,417 0
General Builders, Ltd.	2,408 0
Chambers Bros.	2,395 0
T. H. Kingdell & Sons	2,389 0
E. A. Roome & Co.	2,369 0
H. J. Williams, Ltd.	2,347 0
T. D. Leng	2,318 0
E. J. Clayton	2,317 0
Wilkinson Bros.	2,300 0
J. Smith & Sons, Ltd.	2,298 0
Spencer, Santo, & Co., Ltd.	2,293 0
Martin Wells & Co., Ltd.	2,290 0
Wisdom Bros.	2,250 0
W. Wallis	2,248 0
Barnard & Son	2,245 0
B. E. Nightingale	2,244 0
A. Hudson & Co.	2,242 0
J. Christie	2,197 0
W. J. Kershaw	2,187 0
J. Appleby & Sons	2,194 0
R. Dean & Co.	2,190 4
J. Shelbourne & Co.	2,179 0
Galbraith Bros.	2,153 0

LONDON.—For building a dwelling-house in the Manor Way, Lee-road, Lee, S.E., for Mr. H. McAuliffe. Mr. L. V. Hunt, architect:—

Green	£2,150	L. Whitehead & Co.	£2,038
Collingwood	2,117	W. Akers & Co.	1,887
J. & C. Bowyer	2,033	Kenard Bros.	1,813

LOUGHGELLY.—For levelling, draining, and forming roads, with fencing & gates, for proposed public park for the Magistrates and Town Council Messrs. Buchanan & Bennett, C.E., 12, Hill-street, Edinburgh. Quantities by engineers:—
J. Martin .. £1,189 14 10
Mitchell & Sons £1,221 7 5 R. Gilmour. 1,011 11 8

NORWICH.—For alterations and addition to Free Library, for the Free Library Committee. Mr. A. E. Collins, City Engineer, Guildhall, Norwich:—
J. S. Smith, 24, City-road, Norwich £1,547

PRESCOT.—For enlarging the dining-hall at Whiston Workhouse, for the Guardians. Mr. James Gandy, architect, Masonic-buildings, St. Helena. Quantities by architect:—
C. J. Middlehurst, St. Helena* £359
[Thirteen tenders received.]

REIGATE.—For erecting cottage, Blackhorse-lane. Mr. C. E. Salmon, architect:—
W. Wickman £416 J. King & Son*.... £380

SELBY OAK.—For erecting a public library, for the King's Norton and Northfield Urban District Council. Mr. A. W. Cross, Engineer, 23, Valentine-road, King's Heath:—
G. Webb, Handsworth £2,872

SPROWSTON (Norfolk).—For the erection of an infants' school, for the Norfolk County Council. Mr. C. J. Brown, architect and surveyor, Cathedral Offices, The Close, Norwich:—
R. Burton .. £2,620 15 9 Boddy & Son £1,585 0 0
Riches 1,750 0 0 Chapman & Son 1,578 0 0
Youngs & Son 1,563 0 0 G. Stowers
Gill 1,490 0 0 143, Sprow-
Lincoln 1,657 0 0 ston-road,
Searles Bros. 1,633 0 0 Norwich*. 1,540 0 0
Hannant 1,625 0 0
Greengrass .. 1,587 0 0

STIRCHLEY.—For erecting a public library, for the King's Norton and Northfield Urban District Council. Mr. A. W. Cross, Engineer, 23, Valentine-road, King's Heath:—
G. Webb, Handsworth £2,868

STOW-ON-THE-WOLD (Gloucester).—For the erection and completion of a new rectory house, for the Rev. J. T. Evans, M.A. Messrs. Heald & Overbury, architects, Cheltenham and Gloucester:—
T. Burden .. £2,709 2 0 Collins & Godfrey .. £2,130 0 0
G. Howman & Co. 2,311 13 10 Eatecourt & Sons, Gloucester 2,120 0 0
A. Groves & Sons ... 2,301 11 0
Byard & Son 2,227 0 0
* Accepted subject to certain modifications.

TIVERTON.—For additions to a house, Blundell's School, for the Governors. Mr. W. Barrons, architect, Deepway, Tiverton:—
Nicks Bros. £1,950 0 W. Loosemore .. £1,595 0
Ladon & Sons 1,554 0 J. Grater & Sons, Tiverton* .. 1,594 19
R. Grater & Sons 1,598 0

TIVERTON.—For new house, Blundell's-road, Tiverton, for Mr. E. F. Clarke. Mr. W. Barrons, architect, Deepway, Tiverton:—
J. Grater & Sons, Tiverton* £1,021
[No competition.]

TWYNING.—For erecting a new Council school at Twynning, near Tewkesbury, for the Education Committee of the Gloucestershire County Council. Mr. R. S. Phillips, Surveyor to Committee, Shire Hall, Gloucester:—
Collins & Godfrey, Tewkesbury* £1,830

WELLINGBOROUGH.—For laying 1,600 sq. yds. of asphalt footpath, for the Rural District Council. Mr. G. F. Bearn, Surveyor, Market-square, Wellingborough:—

Per yd.	s.	d.	Per yd.	s.	d.
J. Smart	2	0	Soudamora & Co.	1	0
Goodman & Murkitt ..	1	10	W. G. Wilmot	1	0
R. Redford	1	10	Constable, Hart, &		
J. J. Ingram	1	9	Co., Kentish Town* ..	1	7
F. Henson	1	0			

WHITCHURCH (Salop).—For erecting a Wesleyan Chapel at Lightwood Green. Mr. J. H. Pickard, architect, Whitchurch. Quantities by architect:—
J. Harding .. £1,095 18 2 T. L. Kendall £364 0 6
Dodd & Son .. 990 0 0 Chesters & Holland ..
S. Manley 969 10 0
G. Edge 963 10 0
Stratton & Gibson 930 17 0

WIDNES.—For the enlargement of West Bank Convent School, for the Education Committee. Mr. F. U. Holme, architect, Westminster-chambers, 1, Cross-hall-street, Liverpool:—
S. Webster £597 0 W. Podmore £545 0
G. W. Devonport 590 0 Duthie & Dobson 531 0
J. Crake 588 0 J. Lucas & Son .. 529 10
W. Hall & Son .. 531 10 Parker & Son 529 10
Holmes & Green .. 575 0 J. Bothwell & Sons 524 0
J. Gerrard & Sons 563 0 J. & E. Rimmer 512 0
J. Beech 555 0 J. Mercer, Dilton* 498 0
J. Penney 553 0 G. Woods & Sons 487 0
P. Tyson 546 0

WINTON.—For erecting a chapel and vestries at Winton, near Bourne-mouth, for the Primitive Methodist Connexion. Mr. T. E. Grimes, architect, 71, Talbot-road, Winton:—
G. Shears & Son .. £1,918 10 0 Jones & Seaward £1,649 0 0
S. Brown & Son 1,724 13 0 A. J. Colborne 1,619 8 0
Sons 1,720 0 0 E. H. Crabb ..
T. Dadd 1,716 10 0 Parkstone,
G. A. Drake 1,705 18 9 Bourne-mouth* .. 1,450 0 0
Burt & Okerrett ..

YARDLEY.—For sewerage works, Acock's Green, South-east, for the Rural District Council. Mr. A. W. Smith, Engineer, Council House, Sparkhill, near Birmingham:—
Curral, Lewis, & Martin, Icknield Port-road, Birmingham £1,899 10 2

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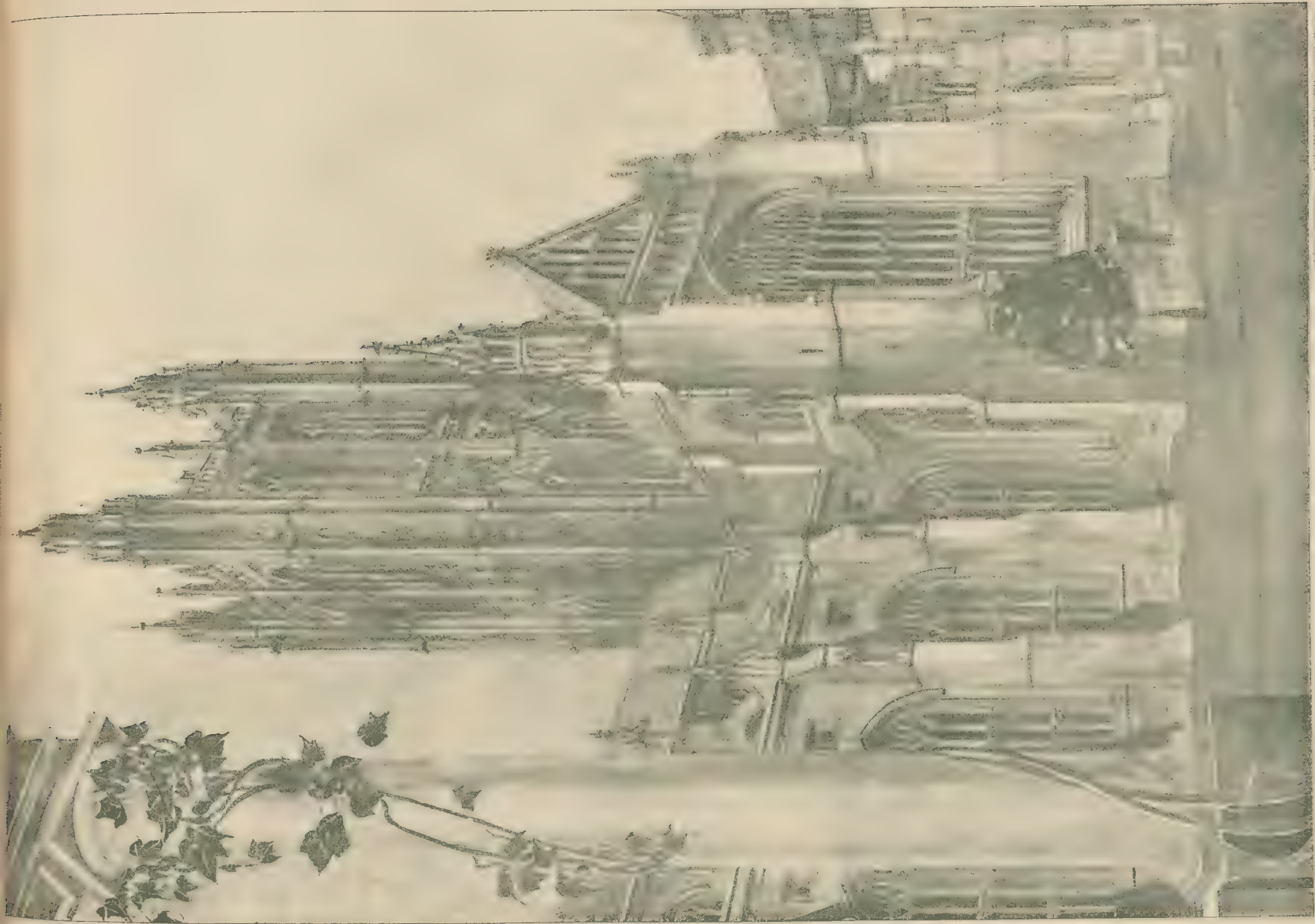
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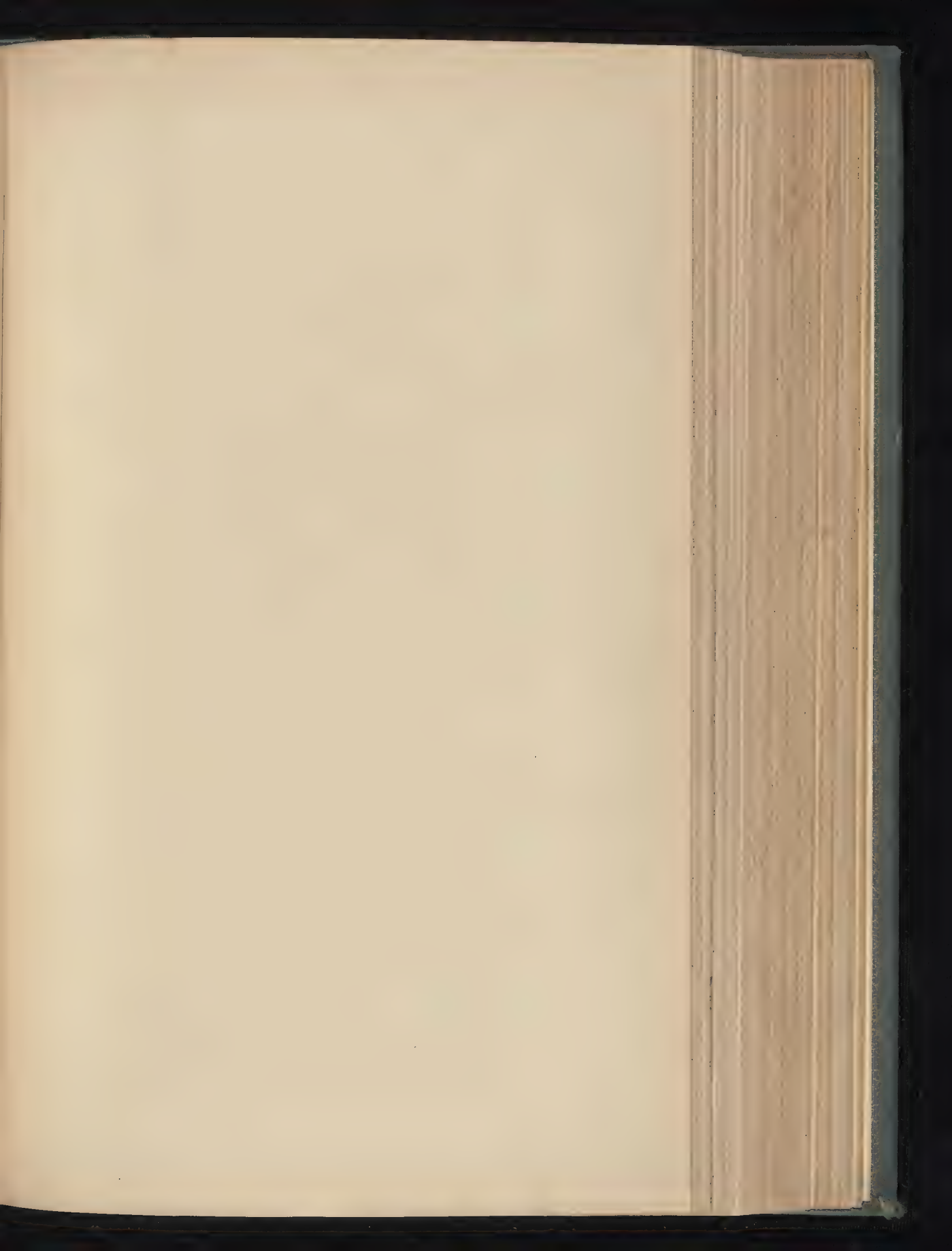


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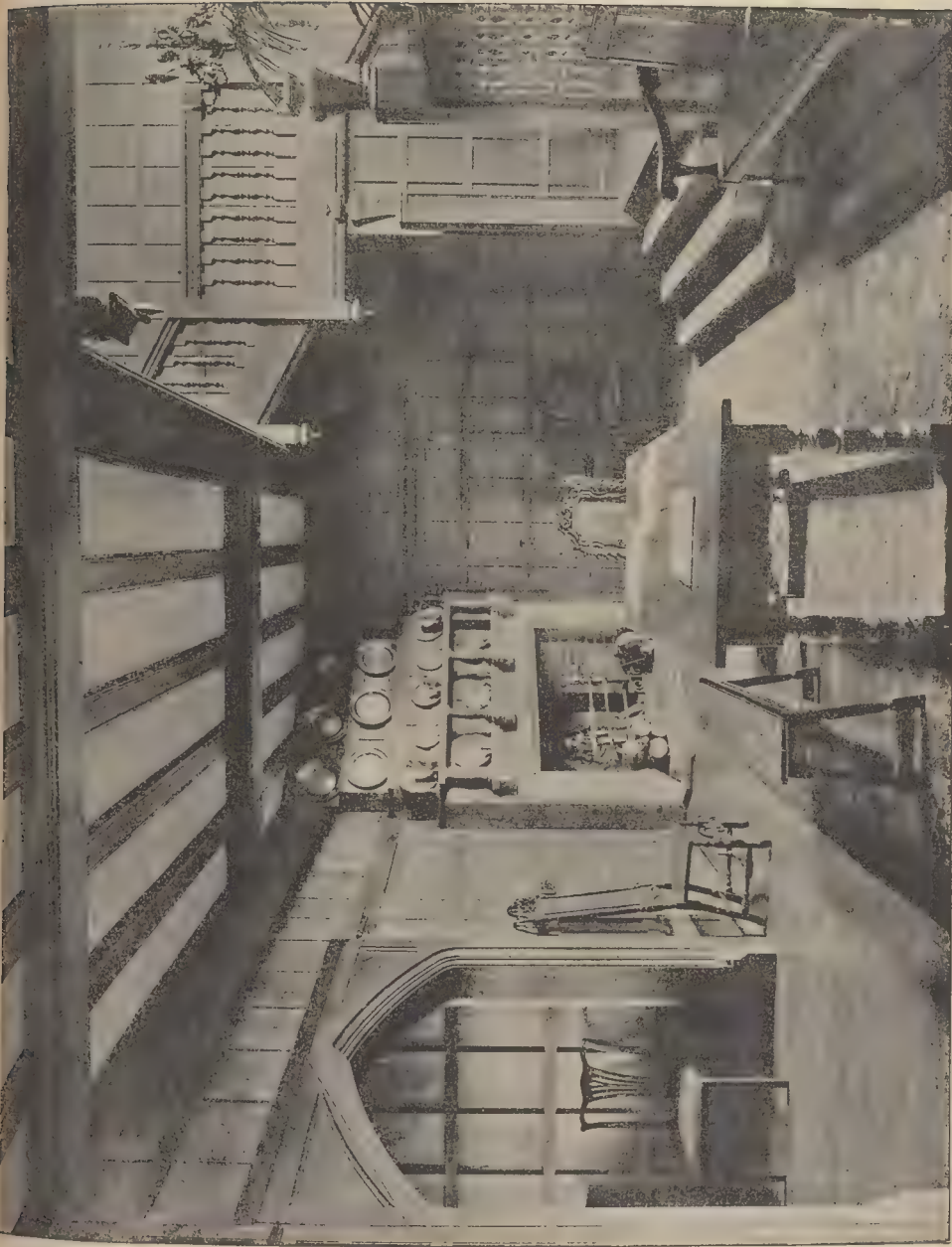
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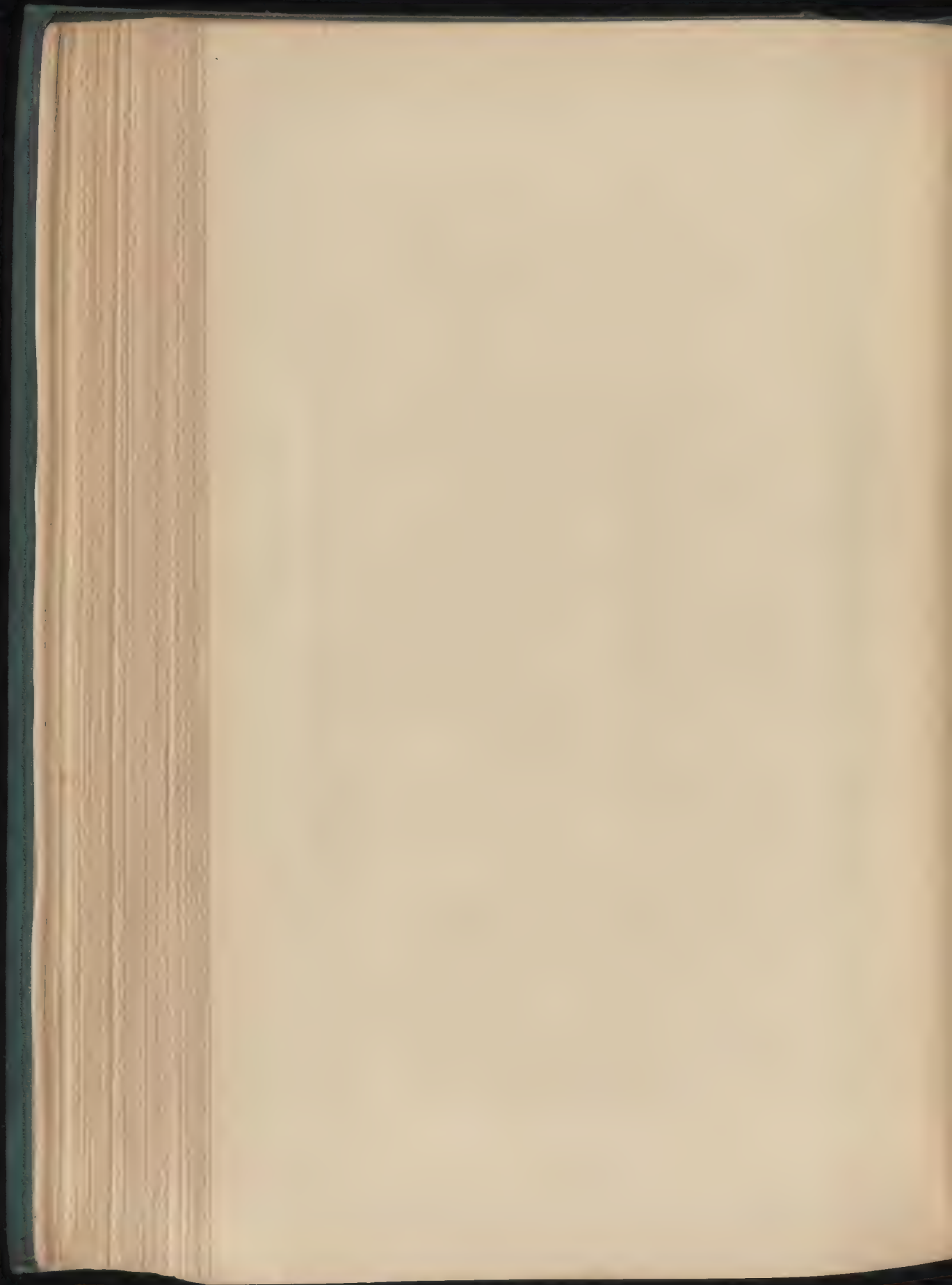
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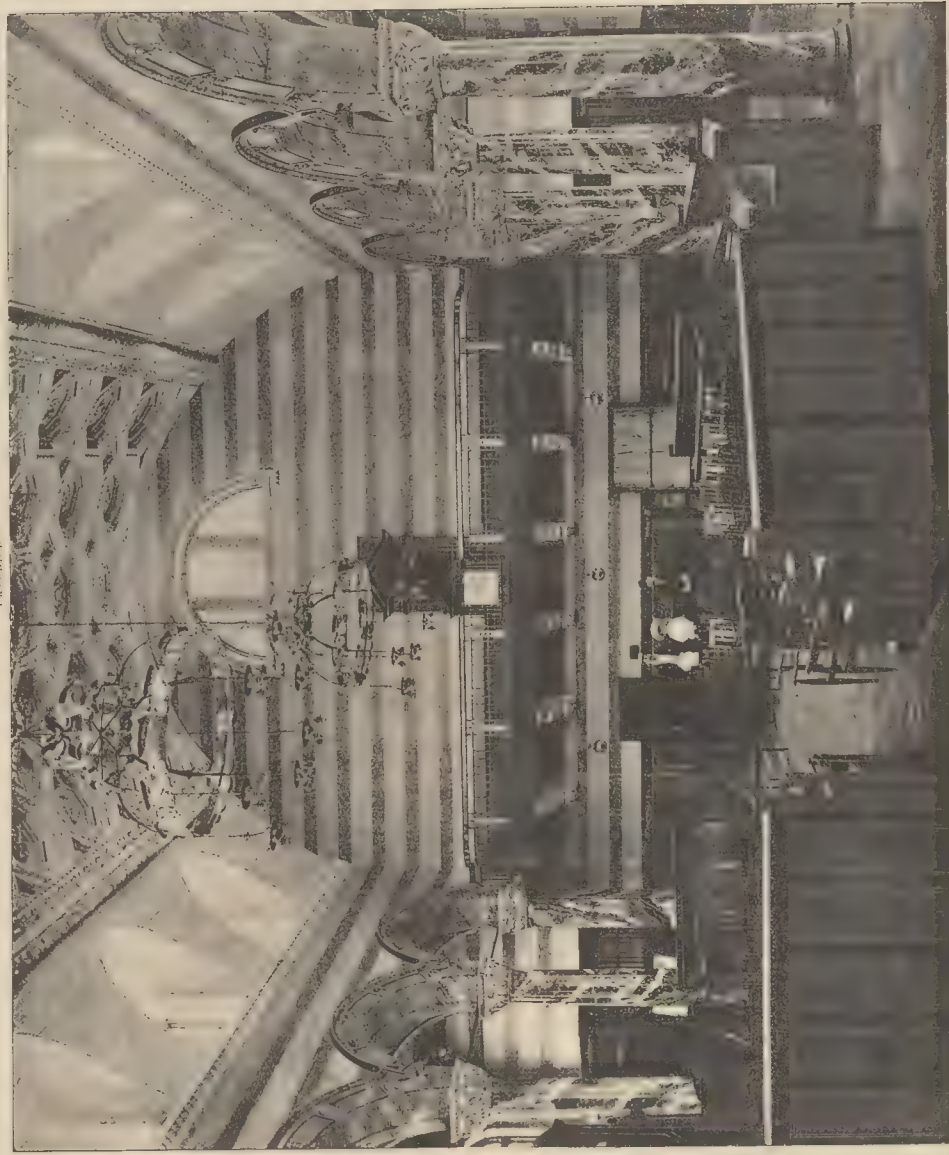
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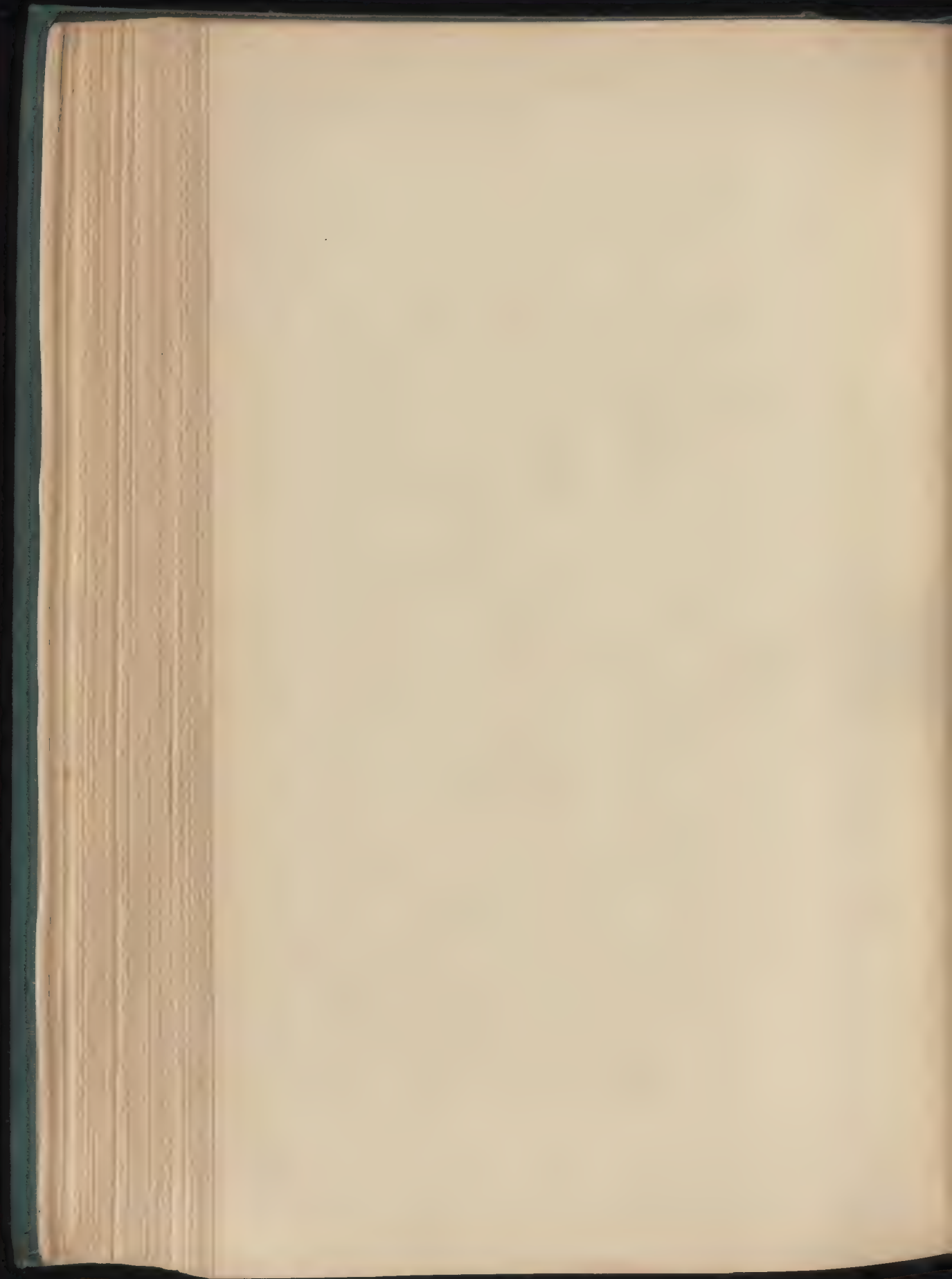


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2. Entrance to Memorial Hall and Cadets' Quarters.	
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The Workmen's Compensation Bill.



HE Bill to amend the Workmen's Compensation Acts has now been printed, and it may be useful to consider shortly how it proposes to amend the law as regards com-

pensation to the workmen of those engaged in building and engineering undertakings. Buildings are now brought within the scope of the measure without any limitations whatever; the employment need only be "on or in or about a building which is being constructed, altered, repaired, decorated, or demolished by the undertakers," or even "away therefrom," if it is proved that the absence of the workman from such building was due to the nature of his employment at the time of the accident. It will be observed that not only are all restrictions, such as the height of the building, the use of scaffolding and of machinery, thus removed, but the operations to be carried on upon the building have been so amended as to carry out what the House of Lords stated in one case to be the intention of the Act—that is to say, to cover all the phases in the life of a building. In the defining clause moreover, the period of the birth of the building, as far as the Workmen's Compensation Act is concerned, is also determined, as the word "building" is to include "the site of an intended building," and the construction of a

building is to include "the work of preparing for and laying the foundations of an intended building." The "undertakers," in the case of a building, are to be "the persons undertaking the construction, repair, decoration, or demolition."

It will be seen that the law will be greatly simplified if the above amendments are adopted, as, in addition to the limitations above mentioned, the cross-references to machinery used in building operations by reference to the Factory Acts have also been abolished, but all builders will in future be included in the Act. We have in former papers pointed out that, although the Departmental Committee advocated this extension of the Act, they were fully alive to the drawbacks involved in including the class of very small builders in the absence of a system of State insurance, and their recommendation seemed based on the difficulty of suggesting any satisfactory limitations which would not involve the amount of litigation that has already been experienced. The objection to the proposed extension still remains that the remedy given to workmen when the employer is impecunious is not only valueless but is even injurious, since both parties may become involved in the costs of useless litigation if an attempt is made to enforce it.

In the Bill now under consideration the definition of an "engineering work" has also been amended and extended. It is to include "any railroad, harbour, dock, pond, inland navigation, road, embankment, sewer, gas or water works,

well, telegraphic line, or electric line or work, or part thereof; which is being made, laid, altered, repaired, demolished, or removed." "Telegraph line" is defined by reference to the Telegraph Act, 1878, and "electric line or work" by reference to the Electric Lighting Act, 1882. It will be observed that the engineering undertakings to be within the Act are now specifically enumerated; and the uncertainty involved in the wording of the existing Act, "any other work for the construction, alteration or repair of which machinery driven by steam, water, or other mechanical power is used," has been avoided; but the use of machinery no longer remains a condition necessary to bring the undertaking within the Act.

We do not propose in the present article to discuss this proposed measure in any detail, although some of its provisions as at present drawn are open to criticism; thus the Committee recommended that, if the employer was to be made liable over an increased area—that is to say, when the workman was engaged on his business but off his premises—this should not be the case under section 4 of the Act, which imposes liability upon an undertaker for his sub-contractor's workmen. Clause 5 seems directed to carry out this suggestion, but the wording does not sufficiently clearly indicate that in such an event an accident must have occurred on or in or about the undertaker's own premises. The definition of the undertakers of a quarry by reference to the Factory and Workshop Act, 1901, as the occupiers thereof, is extremely unsatisfactory, since no definition of

"occupation" occurs in that Act; and it has already been expressed that employers of men engaged in quarries are very often not the "occupiers" in the ordinary sense, but independent contractors sending to the quarries to get out or cart away a limited amount of stone. We have frequently urged that the definition of "undertakers" adopted in the case of docks, wharves, quays, and warehouses should be adopted in the case of quarries, viz., "the person having the actual use or occupation" of the premises, since this covers such a temporary occupation as that above described.

The Bill contains important innovations in regard to compensation. Workmen over sixty years of age can be employed under contract specifying the maximum amount of compensation they are to be entitled to in case of accident or death, but the minimum compensation is prescribed by the Bill. Similar provisions are also introduced in the case of workmen specially liable to accident from age or infirmity; whilst workmen injured under twenty-one years of age, and whose average weekly earnings are less than 20s., are to be compensated up to 50 per cent. of their earnings, provided this does not exceed 10s. a week.

We should have been pleased to find some such limitations as the above imposed on the compensation to be paid to men only casually employed, as the full compensation is very hard on employers only employing a hand casually; but the only provision in the Bill dealing with this question is that when they have not been employed for four weeks by the same employer, the compensation may be assessed on the basis of the amount earned by persons in the same grade and the same district.

There are other important provisions in the Bill, notably those dealing with the reference of questions to medical referees, which however we need not here comment upon:

TALL CHIMNEY CONSTRUCTION.

ONE of the most striking features of a manufacturing town is its forest of tall chimneys, rising up from the lower buildings and standing in clear-cut silhouette against the sky, like poplar-trees amid a dense growth of brushwood. And though at times a more appropriate simile would appear to be that of pall-bearers to a city shrouded in gloom and fog, yet even then their weird and weather-stained outlines are by no means lacking in a certain impressive dignity, such as appertains to erectness and strength.

From an artistic point of view, however, the capabilities of a factory chimney are not particularly remarkable. The structure is too obviously utilitarian to lend itself to pretentious decoration. Anything of the kind, in fact, would be out of place. Simplicity is the true keynote of chimney design, and chimney shafts treated in a plain and simple manner will prove not only more appropriate to their functions, but more in accordance with their proportions and more in harmony with their environment.

The object of a chimney shaft is two-fold—in the first place, to induce a draught of air sufficient to cause and

maintain perfect combustion of the fuel in the furnace to which it is attached; and in the second place, to discharge the gaseous products of combustion at such a height above the ground as shall render them unobnoxious to the inhabitants of adjacent tenements and harmless to vegetation, etc., in the vicinity generally. An insufficient current will cause incessant toil in firing, and will produce great volumes of black smoke—the sure indication of faulty combustion.

The problems which present themselves in connexion with the subject may be enumerated under four heads, viz.:

- (1) The internal capacity, and
- (2) The height of the chimney;
- (3) The pressure on the foundation, and
- (4) The stability as regards wind pressure.

Each of these points is deserving of consideration, and it will perhaps be desirable to deal with them in turn.

The internal capacity of a chimney is obviously governed by several factors, such as the type and size of boiler, the area of furnace, the kind of fuel, and the rate of combustion; while the height of the chimney is influenced by the level of its base above the sea, the extreme range of external temperature, and the velocity of draught required. To a very large extent these matters are interdependent, and various empirical equations have been devised to connect the several data in a convenient form. One of the simplest and handiest, based on the fire-grate area, is:—

$$\frac{\text{Minimum sectional area of chimney in square ft.}}{1.2 \text{ to } 1.5} = \frac{\text{Grate area in square ft.}}{\sqrt{\text{Height of chimney in ft.}}}$$

Other formulæ are connected with the coal consumption, the quantity of water evaporated, and the volume of air essential to combustion. Any one of these data may be employed in connexion with the foregoing equation, by means of a suitable commutation of the coefficient, the value for which, however, admits of considerable variation, so that it is impossible to do more than indicate it in very general terms. Thus, 1 sq. ft. of grate area may be taken on an average to consume from 15 lb. to 20 lb. of coal per hour, and 1 lb. of coal, according to quality, will evaporate from 10 lb. to 12 lb. of water, from and at 212° Fahr., and will require from 22 lb. to 24 lb. of air for its combustion with natural draught. Another factor, termed the boiler horsepower, has been introduced, but its use is scarcely legitimate, depending as it does on so many features connected with the engine alone.

Local regulations not infrequently prescribe the height to be adopted, and chimneys emitting gases which have been evolved in chemical processes should be at least 250 ft. high. The loftiest chimney in the British Isles is probably that at Townsend's Chemical Works, Glasgow, built in 1857-59. It is 454 ft. high from ground to coping, and is closely followed by the St. Rollox chimney of the same town, which is 435 ft. high. Chimneys over 400 ft. in height, however, are rare, and the majority do not exceed 300 ft.

The third problem is scarcely determinable apart from the specific conditions of each site. The intensity of pressure on any ground save rock

should never be allowed to exceed 3 tons per square foot, and in many instances it will be desirable to keep considerably within that limit. In any case a substantial bed of concrete should be interposed between the chimney structure and an earth foundation. A thickness of 3 ft. should be regarded as a minimum for chimneys of 100 ft. in height, and from 5 ft. to 8 ft. is no uncommon dimension in the case of ordinary chimneys below 200 ft. in height. Of course, much depends upon the level at which a reliable natural foundation is encountered; and when this is at a considerable depth pockets may economically be introduced into the concrete work, as shown in Fig. 1. Sometimes a trustworthy stratum cannot be attained within reasonable limits, and then recourse has to be had to piling. A chimney 262 ft. high, built at Paris in 1900, and weighing not less than 5,660 tons, derives support ultimately from 140 oak piles, 12 in. square and 23 ft. long, driven down to compact gravel.

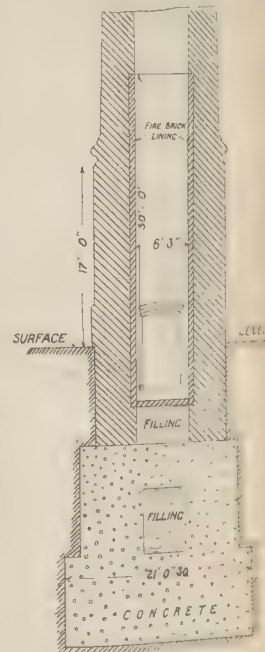


Fig. 1. Chimney Base and Foundation.

Height of Chimney 12 ft. 0 in. 1 ft.

While the concrete bed will have a considerably augmented area as compared with the chimney base, in no case be allowed to extend to a distance exceeding 10 ft. from the depth of the concrete in respect to the intensity of pressure at its under surface (in tons) beyond the face line of the in the lowermost brickwork, otherwise it will be liable to fracture. If the amount of protection be fixed by any special considerations, the depth of the concrete must be determined accordingly. The

"spread" of footings should be at least equal to the thickness of the wall at its base.

The pressure on the bottom course of brickwork is no less important than that on the concrete bed. Ordinary brickwork in cement will fail at a pressure of 30 tons per square foot, and in lime mortar, thoroughly set, at a pressure of 25 tons. One-fourth of these pressures should be looked upon as the maxima consistent with safety. Despite its greater strength, Portland cement mortar is not altogether suitable for chimney work; it does not stand heat well, unless it is mixed with a very considerable quantity of salt, which materially reduces its strength. Another objection has been put forward that Portland cement mortar diminishes the elasticity of a chimney and prevents it from rocking in the wind. The objection is somewhat fantastic, and can hardly be commended for its common sense. A rigid chimney must undoubtedly be preferable to one which sways.

The stability of a chimney has lastly to be considered in reference to wind pressure. Various values have been assigned to this force. The Board of Trade has officially specified 56 lb. per square foot as a maximum for bridges in this country, but some authorities recommend the adoption of so high a figure as 75 lb. The latter of these is undoubtedly excessive, for the former even corresponds to a hurricane with a velocity of over 100 miles per hour. Possibly so intense a pressure may have been experienced momentarily on a very small area; but it is probable, if not certain, that distributed over the entire height of the structure the pressure will hardly attain anything like that intensity within the British Isles, at all events. In all likelihood a uniform pressure of 50 lb. per square foot is the most that need be anticipated. In Germany inland chimneys are only supposed to be called upon to withstand a wind pressure of 25 lb. per square foot, while for those on the coast the limit is taken at 40 lb. In Austria 30 lb. is the general assumption, while the chimney at the Paris Exhibition, already referred to, was calculated to withstand a maximum of 65 lb. As a matter of fact, most existing chimneys in this country will be found quite capable of resisting a wind-pressure of 100 lb. per square foot, if necessary.

The square section offers the greatest

surface opposition to wind. Taking it as unity, the values of other forms are as follows:—Hexagonal, .85; octagonal, .75; circular, .5. On the Continent the circular coefficient is taken at .66. This form, then, is evidently the most effective, but in chimneys of small diameter the curvature of the circle is unsuitable for ordinary brickwork, as the special material required is expensive. Hence the octagonal shape is often adopted.

Having determined the horizontal wind force and the vertical force of gravity due to the intrinsic weight of the structure, the stability of a chimney depends upon the position in which the line of action of the resultant, compounded of these forces, passes through the base or any bed-joint. According to Rankine's investigation, the limiting position of the centre of resistance must be such that the ratio of its deviation from the centre to the external diameter of the chimney at that level does not exceed $\frac{1}{4}$ for round chimneys and $\frac{1}{3}$ for square chimneys. The intensity of pressure will, of course, vary with the position of its centre of application, and may attain a maximum at the leeward side of double the mean intensity.

The height of a chimney naturally regulates the thickness of its sides, but the minimum thickness at the top is primarily determined by the internal diameter at that point. For chimneys with an internal diameter at the summit of less than 4 ft., 9-in. work may suffice, but 14-in. work is more desirable, and should be adopted, at all events, for chimneys the diameters of which exceed 4 ft. The top of a chimney has not only to encounter a very intense heat, but it is also in a most exposed position, and consequently is frequently the first portion to show signs of wear. The London Building Regulations, however, do not demand a greater thickness than 8½ in. for the first 20 ft. downwards, with a regular increase of half a brick for every additional 20 ft. Other authorities specify an increase of half a brick for every 25 ft. In any case, the bottom thickness should conform to the serviceable empirical formula:—

$18 \times \text{height} + \text{thickness at top}$; and the external diameter at the foot of the shaft should be not less than $\frac{1}{4}$ height—generally, $\frac{1}{2}$ height for circular, $\frac{1}{3}$ height for octagonal, and $\frac{1}{4}$ height for square bases.

As regards decoration, a very ornamental cap to a chimney is a mistake. In lofty chimneys the details cannot be perceived from below, and there is every probability of disfigurement from sooty deposits. A few bold mouldings in stone or terra-cotta constitute all that is essential to give an effective finish. Cornice stones should not project beyond the face line of the main work so far as to bring their centres of gravity on or near the outer edge, and they should be securely cramped in position (Figs.

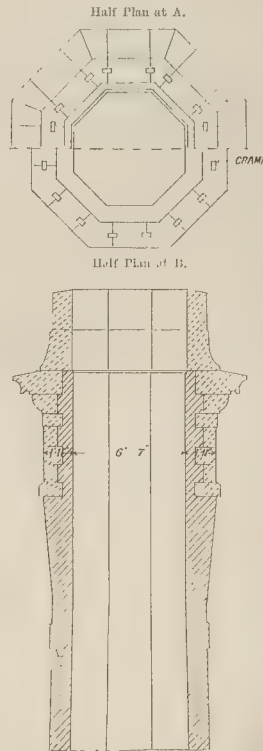


Fig. 3. Cap of Chimney 160 ft. high.

2 and 3), preferably with cramps of gun-metal or copper. Sometimes a cast-iron cap is provided, in several pieces, bolted together and lined with firebrick, as shown in Fig. 4. The object is to avoid the blackening of the terra-cotta mouldings below; any sooty deposits on the metal itself cannot be observed.

The exterior surfaces of chimney shafts are often intersected, at intervals, by horizontal bands or string-courses; these may be contrived so as to produce a pleasing effect. Projecting string-courses are not essential or altogether desirable; a contrast in the colour of the brickwork will suffice for the purpose. The quoins of angular chimneys may likewise be picked out in this way. A pedestal is another feature of common occurrence. It has a height of some 20 ft. on an average, and is generally square in plan, even in the cases of octagonal and circular chimneys. (Fig. 5.)

In the interior, chimney shafts will advisedly be lined with fire-bricks set

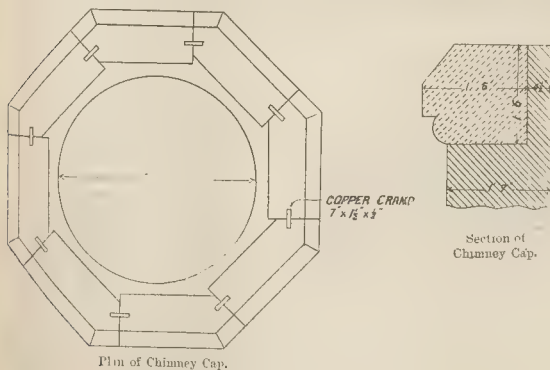


Fig. 2. Chimney 120 ft. high.

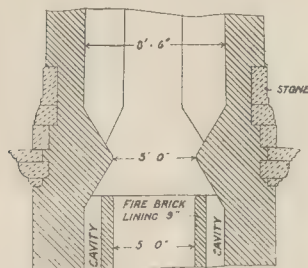
in fireclay, at any rate to a height of 30 ft. from the floor of the flue. This lining should be entirely independent of the main structure, being separated from it by a cavity 2 in. or 3 in. in width, which is sometimes put in free communication with the outer air; but this tends to reduce the internal temperature of the chimney, and is therefore open to objection. The top of the cavity should be protected by oversailing courses, so as to prevent the deposition of soot within it. (Fig. 5.)

The erection of a chimney is generally carried on from the inside, with the exception of the lowermost portion, where obvious facilities for scaffolding are afforded. Scaffolding, however, cannot economically be carried to a greater height than 50 ft. or 60 ft. Put-log holes are not permissible; all stiffening of the standards should be effected by angular and cross bracing.

The bond employed for chimney brickwork is generally English garden-wall bond—three courses of stretchers to one of headers, the binding of the shaft circumferentially being of greater importance than the transverse bond. Hoop iron, as an additional tie, though occasionally adopted, is of dubious value, and should only be used with cement mortar; in contact with lime mortar the iron corrodes and becomes useless. Stone flags make a more reliable tie. The walls should batter to the extent of at least 1 in. in 4 ft.

For obvious reasons, the building of tall chimneys should only be carried on in mild, open weather, and it is furthermore desirable that the rate of progress should be leisurely, in order that the work may have time to set properly before being subjected to a heavy superimposed load. A height of 3 ft. per diem is probably adequate. Communication with the furnace should not be established until the brickwork of the chimney is quite matured.

An arched opening, temporarily built up, is desirable at some point of the base in order to provide access for cleaning and repairs. A copper lightning conductor is the only remaining feature of chimney equipment which calls for mention. Provided with a head of spherical form, having a number of projecting spikes, it passes down the shaft in a flat section, generally in two "tapes," and is carried well into the ground to plate terminals which are surrounded by good conducting material, failing direct connexion with water.



Section.

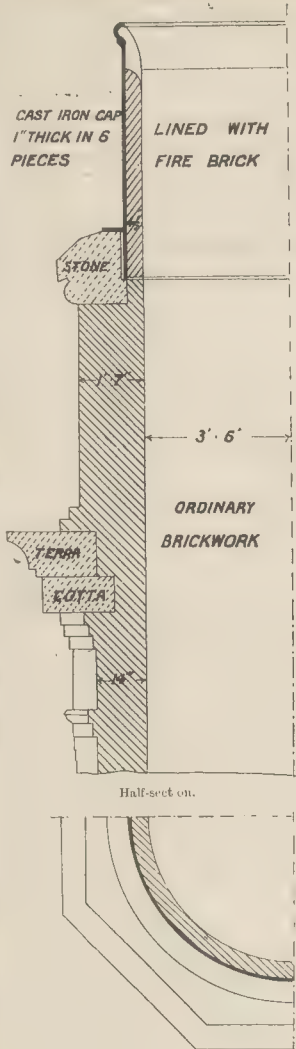
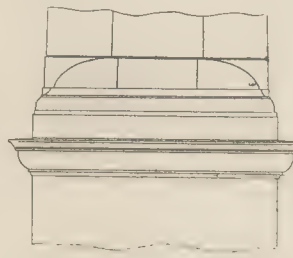


Fig. 4. Chimney 150 ft. high.

The diagrams in illustration of this article have been selected from examples of chimney construction recently executed.



Elevation.

Fig. 5. Chimney Pedestal.

NOTES.

The chief idea suggested by the debate on Monday last, in the House of Commons, on the Bill of the London County Council to place a tramway on the Embankment to connect the northern and southern systems, is one of despair at the manner in which obstruction prevails in English legislation. No man of common sense or of public spirit doubts for a moment that the Embankment is very suited to a tramway, and that such tramway would be a boon to thousands of London workers. Yet the Bill is discussed, partly passed, then rejected session after session, though no one doubts for a moment that ultimately it will become law. On Monday the second reading was carried by the casting vote of the Speaker; now it will have to go through committee, a third reading, and the House of Lords, in all of which places opposition based primarily on opposing commercial interests or old-fashioned prejudice will do its best to wreck it. But, as we say, one of these days the scheme will be carried out and Londoners will wonder why it took years to procure it.

THE Court of Appeal on March 21 decided a point under the London Building Act, 1894, in the case of Leadbitter v. The Mayor, etc., of the Borough of Marblebone. By section 90, subsection 1, the above Act requires notice to be given to an adjoining owner before exercising any rights in respect of a party wall, and by subsection 4, the work must be commenced within six months of the service of the notice. Under section 90, subsection 7, if the adjoining owner, after the service of the above notice, does not within fourteen days express his consent, a difference arises between the parties, which, under section 91, must be referred to surveyors as arbitrators. The decision in the Court of Appeal is to the effect that if the surveyors have not made their award within the six months section 90, subsection 4, does not in such a case apply to render the notice of no avail.

THE North Wales Quarries Limited, was a company formed to work certain quarries in North Wales and there employed men discharged from the Penrhyn Quarries. Now, such is the iron events, a dispute has arisen between some of the workmen—who were at one time employed at the Penrhyn Quarries and the Board of the North Wales Quarries. The basis of the quarrel appears to be that these workmen have been discharged for refusing to sign an agreement under which they cannot, it is alleged, earn a living wage, and which prevents the reference of disputes as to wages to the Conciliation Board. It would be idle to discuss the merits of the controversy without a full knowledge of the agreement in question, but the moral of the dispute is that workmen should recognise that disputes are inevitable even when the ordinary capitalist is not in evidence, and that, so far as it is possible to judge, the ways of trades unionists who are

employers are as harsh as those of the ordinary employer.

On Saturday last the two side cantilevers of the steel bridge over the gorge at the Victoria Falls were successfully linked up, thus virtually completing one of the most remarkable engineering works hitherto undertaken in the way of bridge-building. It is true that there is nothing new in the method of construction adopted, for other great bridges have been built out from the opposite sides of rivers until the steel work met and was joined up above mid-stream. But in this bridge the height of the platform above water level is far greater than in the case of any similar structure in the world, the clear headway under the bridge being more than 400 ft. In these days when tunnels are driven through mountains and under the beds of rivers and estuaries so that the headings, started at either end, meet within a few inches at the predetermined point, engineers are expected to bring together in perfect alignment the two parts of a bridge erected in open air. Still, the task is by no means an easy one, and can only be accomplished by the most rigorous attention to details in the builders' works and by untiring watchfulness on the part of the erecting staff and supervising engineers. In our note of November 12, 1904, we pointed out that the accompaniments of the Victoria Falls bridge threatened to result in serious disfigurement of a magnificent piece of scenery. We are glad to learn that arrangements have been made for devoting a large area of land in the vicinity of the falls to the purposes of a natural public park, and that future building operations will be restrained as far as possible. Temporary structures now required on the site will, of course, be removed when the bridge is finally complete, and if the railway company can prevent the erection of any further monstrosities in the way of timber and galvanised iron hotels they will render a great service to the artistic world.

A PRELIMINARY report has been made to the American Society of Civil Engineers by the special committee on "concrete and steel-concrete," to which we have already alluded. The first business was the recommendation of "a proper descriptive name for a combination of steel and concrete." After careful consideration, the committee unanimously arrived at what we consider to be the entirely inappropriate term of "reinforced concrete." The fact is that the two materials are so combined in practice as to constitute a new building material, which is most suitably designated as "concrete-steel." In reality it is neither reinforced concrete, nor reinforced steel, and the employment of a qualification in this way clearly leads to misconception. Apart from this mistake the committee has done good work. Meetings have been held, at which representatives of various engineering and industrial associations were present, and sub-committees were appointed to draw up an outline of the work to be undertaken and to deal with the important

subject of tests. Twelve technical colleges have promised active co-operation, and materials of uniform quality have been provided for the conduct of experiments. It is hoped that during the present year a sufficient number of tests will have been made to enable some rules to be drawn up for the guidance of designers, although the work of the committee can scarcely be completed in a single year. In the meantime British engineers are doing nothing in the way of investigation, and seem willing to take all knowledge of concrete-steel at second-hand from the more enterprising scientists of foreign countries.

SEVERAL years have elapsed since the appointment of the "Steam-Engine Research Committee" by the Institution of Mechanical Engineers, at the instance of the late Mr. Bryan Donkin. The first report has at last made its appearance in the form of a paper by Professor Capper, by whom the investigation has been conducted at King's College, London. Although covering only a small portion of the subject, the present report is a valuable instalment, and makes clear some points that were previously obscure. Leakage through the slide-valve has been quantitatively determined under definite conditions, and shown to be practically independent of sliding surface and proportional to difference of pressure between the two sides of the valve. Further, it is shown that even with carefully fitted valves the leakage may represent more than 20 per cent. of the steam entering the cylinder. If this happens in the case of a specially made experimental engine, the loss in actual work must be a most considerable source of wasted energy. Another point not previously demonstrated is that initial condensation in an unjacketed cylinder diminishes with increase of initial temperature, while the total condensation per stroke increases with initial temperature increase. Again, it seems that the re-evaporation for a given ratio of expansion is sometimes greater without jackets than with them, and that under certain conditions the use of jacketed cylinders may become unnecessary or wasteful. We hope that no time will be lost in preparing further reports, for steam-engine designers are much in want of reliable data of the kind which has so largely contributed to the rapid and efficient development of electrical machinery during the past few years.

Electric Units.

THE papers on electrical units, read before the International Electrical Congress at St. Louis, which have been discussed at the Institution of Electrical Engineers, show that many electricians are far from being satisfied with the present system of units. It was formerly the invariable custom to begin the study of electricity by considering the attractions and repulsions of pith balls charged by a stick of sealing-wax or a rod of ebonite. The unit of electric quantity thus obtained is known as the electrostatic unit, and the connexion between it and the unit in which a quantity of electric current is measured is not obvious. Maxwell proved theoretically

—and it has since been proved practically by several experimenters—that the ratio of the two units is the velocity of light. Thus it is comparatively easy to change from one system of units to the other. To many electricians, however, this dual system of units is a stumbling-block, and so numerous attempts have been made to alter the fundamental definitions in such a way that one system of units would suffice. In the papers of Professors Ascoli and Giorgi a simple method of doing this is indicated, and the further suggestion is made that the ohm should be chosen as the fundamental unit in terms of which the others could be measured. We think, however, that their suggestions are premature. The very considerable advances that have recently been made in electrical theory, more particularly the identification of an electric current with moving charges of electricity, indicate that the mystery of the connexion between the units will probably be cleared up very shortly. It is, therefore, advisable to delay the recasting of the units until physicists have investigated more fully the properties of ions and electrons. The legal standards for verifying the volt, the ampère and the ohm, which are kept at the Board of Trade Laboratory, meet most practical requirements. We wish, however, that the Board of Trade unit, which is what electric companies profess to sell to their customers could be measured more accurately. An error equal to the half of one per cent. may occur in the most accurate possible measurement, and so the errors in everyday readings must be much greater.

Cotton in Electrical Machinery.

LIGHT is thrown by a recent report of the Engineering Standards Committee upon a point which has somewhat troubled makers and users of electrical machinery. It has often been found that the characteristic curves obtained from machinery installed after exposure to the weather, subsequent to manufacture, have been at variance with those given on test. Such differences have usually been attributed to defective instruments, but it now appears to be demonstrated that they are due to short circuiting through the water actually driven out from the cotton covering of the winding by the rise of temperature that commences when the machines are started. The correctness of this view is supported by the fact that in one of the experiments conducted at the National Physical Laboratory for the Engineering Standards Committee the observations were repeated after the lapse of some time, when an intermediate curve was obtained, showing that partial drying out of the coil had taken place. The tests are of special interest, as very little was known as to the possible leakage through cotton not thoroughly dried. The absorptive capacity of dry cotton for moisture may be realised by the fact that after exposure to the atmosphere for thirty minutes the gain in weight was found to be 0.68 per cent. and after fifteen hours 4.23 per cent.

John Stow: an Anniversary.

LAST Wednesday was the three hundredth anniversary of the death of John Stow, author of an annual "Summary of the

Chronicles of England," the "Annales," and a "Survey of London." The last-named work forms the basis of all the topographical descriptions of London that have been written since. He was buried in the Church of St. Andrew Undershaft, Leadenhall-street, where is the mural monument which his widow Elizabeth erected to his memory. The figure, apparently an authentic effigy, is seated, writing at a desk upon its knees, and was formerly coloured. It is often described as being of terra-cotta, but the material is veined alabaster; above the marble frieze are the arms of the Merchant Tailors' Company, of which he was a freeman. Stow died in his eightieth year, having expended himself upon labours, pursued in poverty, contumely, and neglect, for which James I. rewarded him with a license to "gather, receive, and take the alms and charitable benevolence of all his loving subjects whatsoever inhabiting his cities of London and Westminster and the suburbs thereof." Maitland records that Stow's remains were removed in 1732 to make room for another interment. Stow brought out the first edition of his "Survey of London" in a quarto volume of 483 pages, printed in black letter, in 1598—some copies bear the date "1599"; the second edition, enlarged to 579 pages quarto, appeared in 1603. To his Survey he added an appendix, being the account of London, then printed for the first time, written in Latin by William Fitzstephen, the monk of Canterbury and Thomas à Becket's chaplain. Stow's other works include editions of Chaucer's poems, of the "Flores Historiarum," and of Matthew Paris's and other chronicles. His collections for the Chronicles of England, bound in sixty volumes quarto, and preserved in the British Museum, testify to his amazing diligence and perseverance.

A LOCAL committee is formed for promoting the proposed exploration of the site of

Hyde Abbey, and the uncovering of the foundations which it is known still exist. The Abbey, dedicated to the Holy Trinity, St. Peter, and the Blessed Virgin, was formerly known as the New Minster by way of distinction from the Old Minster—the cathedral built by Kenwald in the VIIIth century. It was founded by King Alfred the Great and his son Edward the Elder for a fraternity of regular canons under, as the first abbot, Alfred's chaplain St. Grimbald, whom he had invited to England from St. Omer. Bishop Ethelwold expelled the canons in favour of some Benedictine monks, who in 1109 removed from the immediate vicinity, on the north side, of the cathedral to new buildings erected in the Hyde meadow near the north wall of the city. They took with them the remains of Alfred, his consort Ealswitha, and their sons Ethelward and Edward the Elder, and of others their descendants. During the contest between Stephen and Mathilda the abbey was burned to the ground with fire-balls thrown from Wolvesey Castle. It was rebuilt, and with greater magnificence, temp. Henry II., and the abbot was summoned to Parliament. Soon after the Suppression, when the revenues amounted to 865*l.* 1*s.* 6*d.* per annum, the

buildings were for the most part destroyed and in 1785 a gaol was erected upon the site. In digging for the foundations of the prison were discovered a large number of stone coffins, sculptured fragments, and miscellaneous objects, amongst them being a stone inscribed, "Alfred Rex 881" in Saxon characters. The ruins had become a quarry for the repair of St. Bartholomew's Church and other buildings in the vicinity.

VISITORS to the spring exhibition at Mr. McLean's Gallery in the Haymarket

have the opportunity of seeing at the top of the room Mr. Peter Graham's fine landscape, "A Spate in the Highlands," exhibited at the Royal Academy in 1873, and painted before the artist had become a mannerist. It is a fine powerful piece of painting, and bears renewed acquaintance very well. Among the other pictures in the gallery is a beautiful example of M. Harpignies—"An Autumn Evening"; Millais' three-quarter length of a young lady named "Clarissa," hardly one of his best works; Israels' "The Convalescent," which also we do not like very much, as it exhibits the sordid realism of poverty without the glamour of colour and treatment which this artist at his best manages to throw over such a scene; a little "Fête Champêtre" by Diaz, a kind of Watteau in a different manner; a fine though hard little painting of "Sheep in the Highlands" by Verboeckhoven, and a very lovely little sketch (it is hardly more) of a "French Pastoral," by Corot.

There are some fine things in Messrs. Tooth's Gallery—

notably Henry Moore's grand sea-piece, "Perfect Weather for a Cruise." Then there is M. Harpignies' fine landscape "Château Gaillard," which we recognise also as an old friend; and an exceptionally good example of Diaz in one of those forest scenes in the painting of which he is almost without an equal. Israels' "A Fisherman's Family" illustrates (by contrast) what we remarked above as to the prosaic realism of the picture of "The Convalescent"; in "The Fisherman's Family" the poverty is as evident, but it is not thrust upon one in its bare realism; it is veiled by a fine artistic atmosphere. M. Bouguereau's "The Bather" shows the usual faultless correctness of this painter, but is as deficient as usual in feeling or point. Among other noticeable things are M. de Bock's "A Silent Pool," a picture rather seeming to be inspired by Diaz; a fine Still Life painting by M. Vollon; and two or three of Chevreillard's amusing satirical studies of the priesthood.

ARBITRATION CASE.—An arbitration has been held in Edinburgh in reference to the purchase of ground by the Edinburgh School Board. The arbitration was between Mr. William G. Mason, farmer, Amisfield Maine, Haddington, and the School Board of Edinburgh, for the purpose of ascertaining the price of ground at Gillespie-street, Edinburgh, to be acquired by the School Board as the site for a school. Mr. Mason claims 9,457*l.* Mr. William Ormiston, architect and surveyor, was sole arbiter. The witnesses examined for the claimant included Messrs. A. W. Macnaughton, architect; J. B. Bennett, surveyor; John Lowrie, builder; William Thorburn, builder; Alexander Calder, builder, and others; and for the School Board, Mr. T. P. Marwick, architect, and others.

LETTER FROM PARIS.

THE Fine Art Committee of the Paris Municipal Council proposes to purchase the whole of the works left in the atelier of the late great sculptor, Dalou. This includes between 350 and 400 works or models in marble, bronze, terra-cotta, and plaster, many of which have never been illustrated or published in any form. Some of the slighter sketches show extraordinary force and rigour of conception, especially those for the "Monument aux Travailleurs," which the artist was working on at the time of his death. This collection, which forms a kind of summary of Dalou's artistic life, can be secured for the sum of 30,000 francs; and it is intended that it should find place in the Petit Palais, along with the works of Carrière. It is hoped in future to render the Petit Palais a kind of museum of the works of eminent sculptors, especially of their studies and sketches, which would have a great educational value for artists.

The first exhibition of the competition designs for "Maisons à Usage de Petits Logements Salubres et Economiques" is open this week in the Salle des Prévôts at the Hôtel de Ville. It does not seem to excite much interest, judging from the small attendance of visitors, nor has it up to the time of writing this been noticed in any of the Paris papers. There are 127 "projets," making up in all some eight or nine hundred drawings; the plans and elevations are in most cases to 1-16th in. scale. The elevations, except in two or three cases, are very uninteresting—the usual style of cheap-looking stone or brick six-story houses; and those with any pretension to design or originality would turn out too costly for the purpose. There is little that is new or original in any of the plans. In most cases four "logements" on each floor have access from a common staircase rising from the basement to the sixth floor. The accommodation consists generally of a kitchen and one large or two small bedrooms, with a water-closet near the entrance; one or two plans show a common working-room or atelier for several "logements." The arrangement of the general block plan appears to have been the chief object of attention with most of the competitors; and some of these plans are ingenious. The plot of ground chosen is a triangular piece with a surface area of 5,630 sq. mètres, bounded by the Rue du Prague, Rue Théophile Roussel, and Rue Charles Baudelaire. Among the designs which are most worth attention is that signed "Four le Peuple," excellently arranged in regard to the general block plan and with a very attractive set of elevations; the planning and arrangement of the separate dwellings is, however, not so good. "Air et Lumière" is an excellent scheme taken as a whole. "Confort" shows a very practical scheme, and both the general arrangement of plan and the style of the elevations suggest the hand of an English "collaborateur." There are a few very ugly schemes of construction in *béton armé*; and one competitor, whose drawings are certainly influenced by a *béton armé* construction, proposes to erect his six-story buildings on pillars forming a covered way, "genre Rue de Rivoli," around the whole plot.

The Municipal Council have commissioned from M. Pierre Roche, a sculptor who has made a special study of this class of work, a decorative fountain including a statue of a young girl symbolical of Spring. It is to be executed in bronze, on a pedestal of stone decorated with gilded bronze and enamels. The work is probably to be placed in the centre of the inner garden court of the Petit Palais. The new Under-Secretary of State for Art, M. Du Jardin-Beaumetz, presided a few days ago at the opening of the "Salon des Indépendants," whose eccentric productions, more numerous than ever, fill the two conservatories on the Cours la Reine. The 4,200 pictures include audacities in colour and drawing which at all events serve to amuse the visitors, but which, with the exception of a few, by good men, are out of the range of serious criticism.

A very different exhibition that of the new "Société des Peintres et Sculpteurs" is to be seen at the Georges Petit Gallery. Among the works exhibited is a remarkable portrait bust of Rodin by the late M. Guillaume. Among the pictures may be specially mentioned the "Nuit en Corréze" by Mr. Thaulow, the curious works of M. Le Sidaner, the "Cathedral of Segovia" by M. Cottet, and the "Coucher de Soleil" by M. René Ménard.

M. Beaumetz has adopted a new regulation in regard to the valuable Gobelin tapestries which belong to the Musée Nationale, and which have been lent out over and over again for official fêtes, etc., to the great danger of serious injury to them. These valuable works are now to be classed among the "Monuments Historiques," with the result that they can no longer be removed from their place, and will be preserved and repaired when necessary at the expense of the Government.

There is talk of erecting in the Champs Elysées a monument in honour of the great modern French landscape-painters. This is also an idea of the new Under-Secretary for Art, who has applied to the Municipality to furnish a site and to be responsible for half the cost of the proposed monument. The best site would be the long stretch of lawn which extends parallel to the river between the Place de la Concorde and the Avenue d'Antin. The monument by M. Mercier to the memory of Armand Silvestre, the poet, is to be erected there; and a series of such monuments, disposed as in the Avenue de l'Observatoire, would have a fine effect without giving that appearance of a Necropolis which is suggested by the scattered monuments of the Parc Monceau. The difficulty will be to agree on the list of painters whose names are to be commemorated on the monument. About Diaz, Dupré, Daubigny, and Corot, for example, there will be no question; but would it be just to forget the landscape-painters of the last century, such as Joseph Vernet and others? Nor is it easy to fix who are to be considered as included among landscape-painters properly so called. There were some animal painters, such as Troyon, who were undoubtedly also great landscape-painters; and the sea-painters would have also a right to their share in the honours.

The "Vieux Paris" Committee has rendered a new service to art in obtaining the preservation of the ancient chapel of the Hôpital Laënnec, Rue de Sévres, which the Département de l'Assistance Publique had condemned for demolition, under the pretext that it was falling to ruins. The Committee in question, however, has shown that the dilapidation of the building—more apparent than real—was the result of neglect, and as they have drawn up a statement of the necessary repairs which involves no very serious expenditure, it is probable that the authorities will undertake to keep up this building, interesting not only for its own sake but because it contains the tomb of the great financial minister Turgot.

At St. Cloud some necessary works have been undertaken, under the advice of M. Moynaux, Inspecteur-Général de l'Architecture, to consolidate the terrace on the river side of the place, the clay foundation of which has shown signs of slipping towards the river. The work was carried out under the immediate direction of M. Lerley. As it was impossible, from the nature of the ground, to underpin, the foundation walls of the terrace have been connected by ties to the existing foundation walls of the cimetière, and are thus prevented from slipping further.

At the Académie des Beaux-Arts M. Denys Puech has been elected, by 19 votes out of 34, to fill the place of the late Ernest Barrias.

The Académie have classed the principal competitors for the Prix de Rome in architecture in the following order of merit:—M. Bonnet, pupil of MM. Daumet and Esquié; M. Boussois, pupil of M. Pascal; M. Etrard, pupil of MM. Daumet and Esquié; M. Grisols, pupil of M. Rejon.

ARCHITECTURAL ASSOCIATION CAMPER AND CYCLING CLUB.—The club have arranged an Easter excursion, starting from Paddington for Hereford, at 6.10 p.m. on Thursday, April 20. Cyclists leave Hyde Park-corner at 5 p.m. Hereford will be the headquarters (the Arms Hotel), and the places to be visited from there include Leominster, Ludlow, Ledbury, Malvern, Worcester, Ross, Abbey Dore, etc.

THE LONDON GEOLOGICAL FIELD CLASS.—This class, conducted by Professor Seeley, F.R.S., begins its twentieth year's season on Saturday, April 23, with a visit to the North Downs at Betchworth. The field class, which is carried on continuously on the Saturday afternoon in May, June, and July, affords practical teaching in geology by studying direct occurrence of the rocks in the basin of the Thames and adjacent country. Further particulars may be obtained from the Secretary, Mr. J. W. Jarvis, F.G.S., St. Mark's College, Chelsea, S.W.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE ordinary fortnightly meeting of the Royal Institute of British Architects was held on Monday evening at No. 19, Conduit-street, W., the President, Mr. J. Belcher, in the chair.

Deceased Members.

Mr. Graham, Hon. Secretary, said he had to announce the decease of Mr. F. S. Waller, who was elected in 1886 and was placed on the list of retired Fellows in 1900. Nearly everyone in the room would be acquainted with the name of Mr. Waller in connexion with Gloucester Cathedral. It was proposed to publish a short memoir, and he was sure they would all agree that a vote of sympathy be sent to the relatives of their deceased member. He had also to record the decease of Mr. S. J. Nicholl, Associate, Medallist of the Institute in 1845. Mr. Charles Hadfield, of Sheffield, had promised to write a memoir of their venerable colleague, and it would be most interesting to hear something of a man who practised architecture sixty years ago. He took it they would agree in a letter of sympathy being sent to the relatives.

The Planning of Cities and Public Spaces.

Papers on "The Planning of Cities and Public Spaces" were then read by Mr. John W. Simpson and Professor Beresford Pite.

Mr. John W. Simpson, after a reference to the literature on the subject and an expression of his indebtedness to the works of Herr Stübben, of Cologne, and Herr Camillo Sitte, of Vienna, remarked that the artistic side of city planning had been almost entirely neglected in England; our authorities, he supposed, did not even realise its existence. The laying out of new streets and roads is nowadays looked upon as purely technical engineering. It was not thus that the cities were created which are still the wonder and delight of the civilised world. The Greeks in the Acropolis, the Romans in the Forum, have given us a model for all time of the way to concentrate the forces at our disposal for the beautifying of a city. Contrast the effect of such spaces, enclosed by splendid edifices and adorned with countless masterpieces of plastic and architectural art, with the forlorn bronze figure stranded on its pedestal amid a tearing stream of traffic which represents the modern idea of a public monument. The "place" of mediæval and Renaissance times, the direct descendant of the antique Forum, has been entirely ignored in our modern city plans. Granted that modern conditions render the "place" no longer necessary as a common centre of exchange and commerce, yet we may do well to examine our fathers' work and save of the artistic heritage what may be adapted to our circumstances. Exhibiting on the screen plans of various ancient "places" in Italian, German, and Flemish cities, the author brought out that, despite their apparently aimless irregularity, they were in reality constructed upon definite principles. With a city we must husband our resources if we are to obtain an artistic whole. If we scatter indiscriminately the material which makes for beauty (and for our purpose this material is represented by the public buildings and monuments) it will be swallowed up in the general mass, and fail of its full effect. In the ancient "places" the statues, fountains, and other monuments were placed, not in the centre of the space, but at the sides. Fountains naturally should be placed beside the beaten trackway. As Donatello's statue of Gattamelata and the little column stand at the side of the entrance to the church of St. Anthony of Padua, so the obelisks and statues of the Pharaohs rose beside the doors of the temples. The ancient churches in Italy were most often engaged on one or more sides with other buildings, and the author gave several illustrations to show how this tended to produce those groups of open places which give such charm to the buildings. The enclosing of the old public "place" was an important feature and a principal element of its charm. No mere open space between streets will give it—the appearance of an unbroken frame of buildings is essential. The author's illustrations made evident two leading principles. First, the monuments being placed at the sides, the centre of the square is left free, and the space is enclosed by a continuous frame of buildings. Next, the "place" must be proportionate in size and shape to the buildings to which it is to give value. Generally speaking, the space in front of a church or other vertical composition will be found to be deep, while that before a town hall or other building whose characteristic

is length is usually wide. The irregular plan of ancient "places," though not in accordance with our modern ideas of "symmetry," do not distress us in execution—they appear natural. The builders did not trouble about theoretical symmetry, but they realised in practice what actually caught the eye. The author directed special attention to the Signoria at Florence—from an architectural point of view the most remarkable square in the world. Its form and size, the disposition of its monuments and buildings, the way in which the streets deliver into it, are all admirably studied. No effort is apparent, and the superb composition is admired without disturbing thoughts as to the causes of its beauty. Again, the plans of the Piazza di San Marco and the Piazzetta at Venice exemplify with the most refined art the principle deduced as to the placing of monuments, the freedom of the central space, the enclosed frame, the absence of geometrical regularity, and the value given to squares by their combination with others of varying form and size. Passing on to street planning, the author referred to the theoretical systems, rectangular, radiating, or triangular, as being one and all devoid of artistic interest; nor did such a consideration enter the minds of the engineers who designed them. They had failed even to solve satisfactorily the practical problem of constructing the shortest route between any two points so as to save time in transit. In ancient towns nearly all side streets entered main thoroughfares at right angles. In the modern triangulated and radiated schemes acute angles were inevitable. Again, the ancients avoided as far as they could the delivery of several arteries of traffic at the same point. This principle was now quite neglected. Considering that the chief object of modern street planning is to save time in getting from one point to another, and not merely to construct the geometrically shortest routes between them, the author turned to the streets of Bruges and the XIVth century in search of guiding principles, illustrating his points by the aid of diagrams. In the whole of Bruges there is hardly a street which formed an acute angle with another, nor a crossing of more than one street with one other. Where a street approached another obliquely, or threatened a complicated intersection, its line would be curved so as to avoid acute angles and confusion. Again, the principle of framing the view by enclosing it and preventing distracting perspective is carried out with as delicate an art in the plans of ancient streets as in those of the open "places." The more limited the impression the more complete is its effect was the sound axiom of art which, consciously or by tradition, guided the old street builders. There is no reason, either practical or artistic, why our streets should have monotonous parallel sides. The author took as an example the characteristic little "Rue de St. Armand" at Bruges. Not only is such a varying line picturesque and advantageous to the buildings, but it affords exactly those spaces for the cab-stands, telephone, and fire-escape kiosks and other constantly increasing requirements which are difficult to provide for and cause obstructions in uniformly regular streets. Violent bends are not necessary; a slight curvature or displacement of the axis line will produce the happiest effects. The concave line of frontage is the most valuable in improving the appearance of a street, and it should be broken as little as need be. In conclusion the author asked, Is it hopeless to suppose that in time our authorities may perceive that mere pulling down, sligning, and widening of streets will never meet our traffic requirements, and that what is needed is artistic and considered planning? To the Institute students especially he commended this problem. Let them not be content to continue by mere tradition the measurement and study of the individual building and its details, important though these be. There lies a rich reward for those who will consider the combination, construction, and grouping by which effect is gained; and the Royal Institute of British Architects Prize Committee might perhaps judiciously stimulate synthetic as well as analytic investigations.

Professor Beresford Pite took for his subject the planning of the streets and public spaces of London. It must be manifest, he said, that counsels of perfection which originated and governed the planning of an architect's Utopia or of a garden city changed in value when the case was altered to the grim actuality of a modern city. Upon the superior commercial value of well-designed wide streets and grand

very and delightful task—he went into the city and recalled names which in themselves called up the pleasant days they had spent in old cities. Professor Pite, however, had a more difficult task, and he had taken them on a personally conducted tour from Westbourne-gate, Oxford and Cambridge-terrace, to Whitechapel, Soho, and Poplar, and he (the speaker) congratulated him on the hopeful view he had taken in his last few sentences, and he began to think that after all they lived in a place which was not so bad as they were so often led to believe. He thought Professor Pite was wise in one thing. Mr. Simpson showed them some beautiful pictures, but Professor Pite abstained from doing that. Eloquence was a far more dazzling method on such occasions than the sheet, and he rather fancied that if views of some of the places referred to had been given Professor Pite's eloquence would have trembled on his lips. He did, however, entirely agree with one thing which Professor Pite said—and thought they did not make enough of it—and it was that London had an advantage which no other city in the world had in a comparative degree in the magnificence of the river which flowed through it. If he was showing a foreigner London he would take him on a steamer from Westminster Bridge and point out the buildings as they went along, and he believed the foreigner would be impressed. The papers seemed to him to deal with two questions. First, how were they to regulate individual buildings; and, secondly, how were they to regulate the streets. They were not the same thing at all. They might have a street of the most excellent proportion, but it might be entirely destroyed if something was put up which was incongruous with its surroundings. They would all sympathise with the observation as to the alterations taking place in the Quadrant, which was one of the most lamentable things which had taken place in modern times. But how were they to prevent it? It could be done only in one or two ways. Either all property would have to be State property, which even in these days was an Utopian idea, or they would have to have such building regulations as to compel people to build their buildings to decent heights. They could not do more than that. They could not possibly prescribe what the design of all new buildings should be, and it would not be a desirable thing if they could do it. He supposed that nowadays the first thing which came upon anybody laying out streets was the desirability of getting rapid access, and that most detestable of modern institutions, the tramway, was largely responsible for that idea. Wherever there was a tramway there came the question of widening the street, and the taking off of corners, and making everything a perfectly straight line, which was one of the most depressing things in the world. Another matter which had been mentioned was the bridges, and in connexion with them, again, what were they to do? Who were responsible for allowing these bridges? Ultimately Parliament was responsible, because every railway company had to go before Parliament, and if nobody took the trouble to oppose the Bill it went through. When the Charing-cross railway bridge was once before Parliament he ventured, on behalf of the Metropolitan Board of Works, to suggest that the railway company should spend more money and make it a decent and ornamental structure. The Chairman of the Committee seemed puzzled with what he was talking about, and at last he said, "Are you asking us to go into an aesthetic question?" He said he was, and the Chairman replied, "We need not go further; let us go on to the next business." Well, that was not encouraging. He did not know how it was, but there seemed to be something in the railway mind which was incapable of understanding what a bridge should be. Sometime ago he was acting for a railway company, and they proposed to go through a park in which there was a beautiful drive to the owner's house. In an evil hour the people who were acting for the owner, and he did not know a railway company, accepted a clause for the putting up of an ornamental bridge for which they were to approve the design. When the railway company submitted the design the unfortunate man nearly committed suicide, and the result was that he offered a substantial sum to the company not to put up an ornamental bridge, because it was as horrible as the ordinary bridge they would have put up. It occurred to him that there was one practical way in which they

might consider this matter, and it was very important and interesting to know that exactly the same state of things they deplored here was equally taking place in every large Continental city one visited. If one went to Milan or Florence, or Venice or anywhere else, one saw the most perfect and beautiful examples of street architecture and street arrangement in the old town, and a fringe of buildings round that which was too dreadful for words. In Milan they found all round the old town barracks, where people were crowded into the flats, and there were perfectly straight streets. Take Florence again, and they would find within a few hundred yards of the most exquisite square ever erected that they had pulled down the old Fish Market and erected a thing worse than anything they had in London. One was led to ask why this epidemic of vulgarity and hideousness was going on all over the world at the present time, and he felt that it was largely due to this reason: If they went back and found out who governed the cities in the old days they would find it was the men of light and learning. The great architects and painters of the day were municipal men who gave the advantage of their knowledge to the city, and they found that in nine cases out of ten where there was a great church or building the men who did the work took an intimate and vital part in the government of the city. Perhaps the man was leader of the guild, or mayor, or was a member of the town council, and he gave the people the advantage of his assistance and great knowledge, and they listened to him. Nowadays, was it too much to say that anyone who had light and learning confined himself to outside criticism? They were people who were averse to meeting with the rough and tumble of municipal life, and the result was that the people who were placed upon local authorities had not, whether they wished it or not, the instruction and knowledge to enable them to carry those things out. He would suggest that all the learned bodies should pass a sort of self-denying ordinance that they should take it by rotation to cast lots as to who should be decimated, and that a certain number of them should go on to these local councils and use their influence, and by quiet talk try to bring these people into a better frame of mind.

Mr. Walter Crane, in seconding the motion, said, although he was not duly qualified as an architect, yet he was, as an artist, greatly interested in the planning of streets and the aspect which modern changes had given them. He came to Mr. Simpson's paper rather with the idea that they would be on sound principles by making their squares and public places take a definite if not a geometrical form, but he felt now a little shaken after the results shown to the contrary. It seemed to him that the character of the square must depend on the character of the town and the buildings. It struck him in regard to some of the plans that had been shown that possibly the original line taken by the street might have arisen from the primitive pathway. He would take an instance in his own neighbourhood, where the little high street until recently took an extremely picturesque line, and although the buildings were of humble character, it was a pleasant street. Now, of course, modern ideas had broken in, and they had very spacious and modern buildings of terra-cotta and plate-glass, and the line of the street was also destroyed. That was the principle they had gone on throughout London. They had made the streets simply openings for traffic, and as traffic meant trade, and everyone, from the lowest to the highest, in this country thought trade was the one object in life, they saw the natural result. They cared only for traffic. They accepted the shortest way for their immediate purpose and let the future take care of itself. He rather envied Professor Pite's optimistic mood, but, at all events, he was on safe ground in carefully avoiding the suburbs. There was nothing more discreditable in their large towns than the suburbs, and yet the suburbs constituted much the biggest part of London. He often wondered what a foreigner thought coming into London, with the terrible squalor of the streets and the mean houses which met the eye. That had destroyed London, and it had destroyed Oxford and many continental cities in the same way. He believed it was Evelyn who recommended that in the extension of London they should preserve the original beauty of the town by starting to build no nearer than a circuit

of ten miles, and it would have been a good thing if that had been done. It appeared that the whole aim of the present world was concentrated in moving fast, and it became a question of how long people would stop in a street, and, therefore, a straight street was obviously useful, for they did not remain in it long enough to see anything. As to South Kensington, he was rather impressed with the Imperial Institute on one side and the College of Science on the other, and from the modern point of view he understood it was the finest thing they had. It was regular, of course, but the architect on the one side had shown consideration for the other architect by repeating his features. The whole question of the expansion of London was serious, and old London was being so rapidly destroyed that one saw a new street almost every time one went out. He wondered that a great city like this had not a permanent committee sitting to consider the question. Mr. Freeman said a remedy was at hand; there was one artist on the County Council, and the only way was to get representatives on local bodies and fight it out. He felt that the tendency of the times was against architectural harmony, and that if they did get a success it would be by accident.

Capt. Hemphill (member of the Improvements Committee of the London County Council) said it might be of some use to that important gathering of architects if he explained the views with which the L.C.C. approached this subject. The two papers they had heard had been very instructive, and as a member of the L.C.C. he was delighted to come there and hear them; but he felt that they had rather a difficult task on the L.C.C., because they had to consider the public, and the public were not always struck with the feeling for art which dominated the gathering there. The public were rather inclined to call them to account with regard to the money they spent. In everything they had done so far they had not pretended to assume a knowledge of art, but they had endeavoured to get assistance and advice from those who were able to advise them, and perhaps it would be remembered with regard to the new street from Holborn to the Strand they had considered the question very carefully, and consulted many eminent architects on the subject. A remark had been made about the widening of the Strand; as a member of the Improvements Committee and other committees concerned he might say they all felt it was most desirable, but the difficulty was that it would cost 300,000*l.*, and they considered they were not justified in spending such a large sum of money as that. With regard to keeping the buildings low, of course it would be delightful to make all the new buildings there in accordance with Somerset House, and in agreement with the two churches, but they had to get back a very large sum of money. They had, however, determined that no new building should be built unless of suitable material, and of a design which should be approved of; and so far as regarded the buildings which had already been erected, the Gaiety Theatre and the New Gaiety Restaurant, the Council, acting under the advice of one of the most eminent architects in London, rejected two or three designs, and he did not think the buildings now, when completed, would be entirely unsuccessful. They sympathised also with the objection to terra-cotta, and had decided that, so far as they were concerned, they would, if they possibly could, stop anything but plain brick or stone. They might fail in this, but it would not be for want of desire to prevent it, for their object was to try and get buildings designed in an artistic way. He thought that Institute could afford the Council very valuable assistance, and the Council would welcome it very much.

Sir Wm. Richmond had thrown out a suggestion in the Council for an Architectural Committee, but there were difficulties in the particular methods proposed by him. The Council would, however, he felt sure, heartily welcome all help in its search for knowledge. The members of the Council did not pretend to be entirely artistic or entirely scientific. In framing the London Building Act, a large portion of which had now been dropped for the present, they did not claim that they knew everything, and they went everywhere and asked for assistance and advice, and he felt the Council owed a debt of gratitude to that Institute for the valuable suggestions it offered, and which were carefully considered, and from which they derived great assistance. He hoped that when

they again asked their assistance, as they hoped to do at a very early date, they would receive their co-operation in the spirit in which they invited it. With regard to members of the Institute coming to the County Council, he could only say that if they could pass the ordeal of election, which was not altogether an unmixed joy, they who were now in the Council would be delighted to have their assistance, and he imagined that they could do no greater service to London than by coming on the Council. As to the pictures they had seen that night, he felt that there was a doubt as to whether the ancient streets would meet modern needs and requirements. While they must admire very much all this beautiful architecture which had been erected in the past, yet they had to realise that the conditions of the future were very different, and it was to the conditions of the future that the architects of London had to look to, and embody, if they could, those beautiful traditions which had been described so well that night.

Mr. H. V. Lanchester, in supporting the vote of thanks, said it struck one on hearing the papers how much more there was on the subject that had not been dealt with. For instance, Professor Pite touched on the subject of landscape, but he only just alluded to it and went away from it. Mr. Crane also alluded to the suburbs, and landscape and suburbs might be taken in conjunction with each other. In dealing with the extensions of their cities they hardly ever took into consideration the natural form of the hills and the landscape that they had to deal with. He thought it was the late Mr. George Gissing who referred to the suburban houses creeping like a disease over the country, and that always struck him as a very telling way of putting it. He differed from one of the speakers, who said that the Continental towns were doing as badly as in England with regard to the suburbs, for he thought on the Continent they did take care that the roads in some way should conform to the contours of the hills, and that the buildings should stand either against or on the hill. Another matter to consider was the gradation from the city to the country. A city might be absolutely formal and comparatively permanent, but when they got into the country they welcomed the decaying, picturesque effects that Nature produced. How were they to bring themselves from the rigid and permanent to the picturesqueness of nature? It was a big problem, and it would be a good subject for a paper dealing with the gradual and natural passage from the heart of a city to the absolutely natural beauties of the country. One thing he endorsed, which was that in the design of a building they ought to consider carefully the peculiarities of its position. He was afraid that too often they did not consider the exact view of a building in a town. They were pretty good at it in the country, but in a town they were too apt not to consider the various vistas before deciding on the actual design. As to the maintenance of the elevation or front of a building when it was an important factor in the design of a street, that had been dealt with in Park, and he could not see why it could not be done here. Mr. Freeman had alluded to the necessity of getting men of light and learning on local councils, but he hardly thought that members of the artistic professions would be sufficiently popular with the general public to be elected. He thought, however, they ought to be co-opted on such bodies.

The Chairman said some very interesting points had been raised that evening, and he felt that the suggestion of a committee of artists, consisting of architects, painters, and sculptors, being formed to advise on alterations and proposals with regard to streets and buildings was a very important matter, and was a matter in which they might well follow the example of other countries. As Mr. Simpson pointed out, the Signoria was a place which many generations of great artists to do, while it would only take one engineer to destroy it in less than a week. Mr. Simpson had spoken of these open spaces appearing to be designed to suit the buildings already there, but might they not also infer that this was a tribute to the architect who had put up a building so suitable to the particular site? No doubt many of these places were originally market places, and they had many such places in this country. They had such market places in Norwich and Cambridge. Professor Pite had mentioned the many spaces that existed in the various

boroughs of London, and in many of the despised suburbs these little spaces were found which could be beautified and opened up, and should be dealt with by the various municipal authorities. But it was important that the municipal authorities should have in their possession some papers or instructions as to the methods of laying out streets for their guidance. No doubt these boroughs would vie with each other and endeavour to make their particular borough superior to any around it. In that direction great improvements could no doubt be made by municipal bodies. As Mr. Lanchester pointed out, there must be some method of dealing with cities as they did with gardens. That was to say, if London was like a forest or wilderness of houses, there might be certain places near their official buildings which should be more formally treated like the formal garden near a house, but it would be a mistake to develop this in every direction. He thought that where formal gardens failed was in being developed to such an extent that the whole country was treated like a huge garden. It would be far better to keep the more formal methods near the house. So in a city their Government and State buildings and museums and other places should be treated with formal surroundings and with dignified approaches, and the outskirts might go off into the wilderness and be allowed to form groups of useful contrasts. Such cities as Bath, for instance, indicated what might be done by formal treatment in small parts, not too extended. Some reference had been made to Regent-street and Piccadilly-circus, and he would not be betraying any confidence if he said that the matter was under the consideration of the Crown officials, and it was very unlikely that any such mistakes and blunders as had already occurred in Regent-street would occur again. They were determined to see that there should be a proper design which should be adhered to, and that the beautiful lines of the Quadrant should be retained; thus any buildings which were put up would be on a recognised scheme and would be carried out under proper conditions. Piccadilly-circus was also under consideration, and there was the possibility of that being in due course satisfactorily developed when the opportunity arrived.

The vote of thanks was then carried unanimously.

Mr. Simpson said the remarks of Mr. Freeman and Mr. Crane had given ground for considerable thought. The proposal that the architects and artists should take seats on the County Council and other local authorities was a very gratifying one except for the artists and architects. He believed, however, that a number of their members did sit on local councils. That, however, he did not look upon as the proper solution of the difficulty. The trouble was that these schemes were conceived and promulgated by the authorities before the artists knew anything about them, and when the artist was asked to assist, the conditions were so rigidly laid down that his scope was very limited indeed. If public authorities would only remember that the first necessity for obtaining a good plan was to get a good architect, then their schemes would be very much more successful than they now are. He was struck by Mr. Crane's remarks about South Kensington. Mr. Crane appreciated the arrangement of the Imperial Institute, the Royal College of Science, and the Natural History Museum. Well, he (the speaker) did not. He had always thought that an opportunity had been missed there. If the Imperial Institute had been left where it was, and the Natural History Museum, instead of running parallel, had been placed at right angles on the west, and the College of Science at right angles on the east side, what a magnificent place they would have had! As it was, the site had been treated like a suburban building site. He endorsed Professor Pite's remarks as to the excellent vantage ground the Thames Embankment gave for their statues and public buildings. It seemed that there was that one essential which the Forum in ancient cities gave for the public buildings and statues. Here they had a site to display their buildings.

Professor Pite said it had been remarked of the Royal Academy that they could always get a better exhibition by a process of further selection, and he believed that in London they could get more interesting and charming selections of buildings than in any other part of the country. They ought to get rid of the idea that because London was not Rome or Venice, therefore it

had no interesting buildings. He thought the announcement of the Chairman as to Regent-street and Piccadilly-circus would give great satisfaction to the Institute. With regard to the Strand Improvement he was sure the County Council's efforts were appreciated, and in the Gaiety buildings they had to be thankful for the mercies they had received; but it was only because they had not refrained from persistently drawing attention to the matter. Let them continue to draw attention to it, lest the two churches be spoilt by the continuation of the Gaiety block. That block was all right in itself, but what of the churches when it was continued? As to the 300,000, he could not quite understand it, for the frontage remained the same, and he could not see how such an enormous sum could be lost. He felt that the exchequer officials were carrying too much weight with artistic members of the Council. Their suburbs were what they were simply because people coming to London only saw them from the railway, but with the dismissal of trams and the advent of motor-cars the suburbs would have a chance. If they went to Stoke Newington and Hackney Marshes they would find many things interesting, and there was a Stratford which those who only went through it by the Great Eastern Railway did not know. The Town Hall there, with the open space in front, was distinctly fine.

The meeting then terminated.

HOOPED CONCRETE.

We have already drawn attention to the remarkable properties of concrete reinforced by a spiral winding of steel,* which has the effect of increasing the compressive strength of the concrete surrounded by the spirals to an astonishing extent. M. Considère, who undertook the experimental investigations that demonstrated the advantages of winding or "hooping" concrete in this manner, has patented the method for application to compression members and to portions of beams that are subject to compressive stress. The system has been adopted at various works in France, and arrangements are now being made for its introduction into Great Britain by the Armoured Construction Company, of Westminster. It is claimed that by the employment of hooping the safe load on concrete in compression may be increased from 500 lb. per sq. in. to as much as 2,000 lb. per sq. in. As some of the tests made by M. Considère upon hooped concrete columns, showing the crushing strength to be more than 13,400 lb. per sq. in. the safe load of 2,000 lb. per sq. in. does not seem to be extravagant. Failing this, based

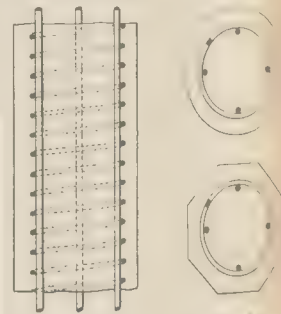


Fig. 1.

Fig. 2.

that the quantity of steel required for a duty is far less when applied as a spiral winding than when the metal is used as longitudinal reinforcement in the ordinary manner, and that the manufacture of hooped concrete members can be conducted very economically as skilled labour is not necessary.

Fig. 1 is a vertical section of a column, and Fig. 2 includes two cross-sections, one circular and the other octagonal. Although some longitudinal reinforcement is necessary for resisting flexure, it will be seen from the diagrams that the rods are

* The Builder, vol. lxxv, pp. 584, 585.



Plant-forms for Use in Decoration.

REFERENCES.

- | | | | |
|---------------------------|------------------------|------------------------|----------------------|
| 1. Herb-paris. | 8. Grass of Parnassus. | 15. Butcher's broom. | 22. Alpine pink. |
| 2. Wild carrot (seeds). | 9. Corn-cockle. | 16. Quake grass. | 23. Wild apple. |
| 3. Wall pepper. | 10. Arrowhead. | 17. Ragged Robin. | 24. Colt's-foot. |
| 4. Yellow wort. | 11. Chickweed. | 18. Stork's-bill. | 25. Flax. |
| 5. Hare-foot-trefoil. | 12. Sea milkwort. | 19. Wild pansy. | 26. Traveller's joy. |
| 6. Ploughman's spikenard. | 13. Maiden-pink. | 20. Wild hops. | 27. White campion. |
| 7. Bitter-sweet. | 14. Sandwort spurrey. | 21. Two-coloured pink. | |

represent only a small percentage of the entire cross-section. Hooped concrete piles have been found extremely serviceable, as they are able to resist the impact of a very heavy monkey at high drop without developing cracks, even when no special cap is employed for protecting the top. In applying hooped concrete to beam design the compression flange has a cross-section, similar to that of an octagonal column (see Fig. 2), but with the addition of concrete at the two upper corners, so as to give a flat surface at the top. The web is about the thickness of the lower horizontal surface of the column, and the bottom flange of the beam is of concrete, reinforced in the ordinary manner.

M. Considère has lately constructed trestle girder bridges of hooped concrete, up to 300 ft. span, for light railways and high roads. The portions subject to tensile stress being built in concrete reinforced as usual, and the portions subject to compressive stress of hooped concrete. These bridges are said to be about 30 per cent. cheaper than steel structures, and in common with masonry bridges they require very little attention and maintenance.

SPICED CEMENT FACTORY IN TRINIDAD.—A report has been prepared by the Government analyst and the Government geologist of Trinidad (Messrs. P. Carmody, F.I.C.S., and E. H. Cunningham Craig, F.C.S.) on the possibility of establishing a Portland cement factory in that colony. These gentlemen are of opinion that clay and limestone suitable for cement-making exist in the colony in sufficient large quantities. They suggest that a cement factory, capable of producing not less than 200 tons a week and capable also of extension to meet further possible requirements, might advantageously be established at Pointe-à-Pierre.

PLANT-FORMS FOR DECORATIVE USE.

THESE are a collection of wild-flowers simplified or conventionalised sufficiently for the purpose of design.

They are collected and drawn by Mr. A. B. McDonald, some of whose designs for textiles have already been illustrated in the *Builder*.

For their use as suggestions in design Mr. McDonald observes that forms such as Nos. 4, 7, 9, 24, etc., are perhaps more useful for reference than Nos. 1, 2, 10, 18, as the latter are complete designs in themselves rather than representations of the flower.

THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A MIDLAND Counties District meeting of the Association of Municipal and County Engineers was held at the University, Birmingham, on Saturday, April 1. The principal business of the meeting was a lecture by Mr. H. K. G. Bamber, F.C.S., on "Portland Cement," and the interest in the subject was shown by the large attendance of members and visitors. Mr. A. T. Davis, C.E., County Surveyor of Shropshire, President, occupied the chair, and among those present were Messrs. J. Price (Birmingham), J. T. Eayrs (Birmingham), A. D. Grestorex (West Bromwich), T. Cank (Worcester), N. H. Dawson (Banbury), J. P. Wakeford (Bilston), R. Mawson (Evesham), G. S. Horton (Edinstowe), J. L. Harner (Brierley Hill), C. J. Fox Allin (Smethwick), A. J. Dickinson (Birmingham), E. B. Savage (Birmingham), H. Richardson (Handsworth), hon. district secretary, and others.

The President briefly introduced Mr. Bamber, who, he said, had on two previous occasions read papers at meetings of the Association. He was sure they would have a most interesting paper on this important subject.

Portland Cement.

Mr. H. K. G. Bamber, F.C.S., then delivered an interesting lecture on "Portland Cement," which was illustrated by a series of limelight and biograph pictures. The lecturer traced the course of recent development in the processes of the manufacture of Portland cement, and described the methods of manufacture from the raw material to the finished product. It was customary, he said, with a high class of Portland cement to grind to very great fineness as compared to comparatively recent practice, when a cement containing 15 per cent. residue on a 50-mesh sieve (2,500 meshes per sq. in.) was quite common, and considered fine ground. In ordinary practice of to-day the cement was ground so that the whole passed a 50-mesh sieve, leaving residue as follows: 50 (2,500 per sq. in.), trace per cent. residue; 76 (5,776 per sq. in.), 1 to 2 per cent. residue; 100 (10,000 per sq. in.), 3 to 5 per cent. residue; 180 (32,400 per sq. in.), 15 to 20 per cent. residue. The specific gravity test had superseded the "weight per bushel," and was a much more reliable test than the latter. It was not affected by the fineness of grinding, which destroyed entirely the value of the "weight per bushel" test. This test was applied as a measure of the calcination to which the cement had been subjected, as, should there be any considerable proportion of underburnt or lightly-combined clinker present in the cement, which would be likely to cause unsoundness, the specific gravity would fall below 3.125, which was taken approximately as the standard for well-burnt cement. The new standard specification provided for cement of various setting times, and described these as follows: There shall be three distinct gradations of setting time, which shall be designated as "quick," "medium," and "slow."

"Quick.—The setting time shall be not less than ten minutes, nor more than thirty minutes."
 "Medium.—The setting time shall be not less than half an hour, nor more than two hours."
 "Slow.—The setting time shall be not less than two hours, nor more than five hours."

With reference to the test of tensile strength it was important that the strain should be applied evenly, and at a uniform rate. The standard usually adopted provided for the application of the strain at the rate of 400 lb. per minute—very irregular results would be obtained if care was not taken in this particular. An average of results of five briquettes, both in the case of neat and sand tests, were usually sufficient for conclusions to be arrived at as to tensile strength. The test of soundness was, perhaps, more important than any other test to which cement was subjected. Portland cement used as a constructive material takes a long period of time to arrive at its maximum strength, and sometimes long intervals elapse after use before defects, if any, begin to show themselves. The tests for soundness consisted chiefly of exposing a set cement to various high temperatures in water, in order to hasten the ultimate results likely to be obtained under various climatic conditions. Many tests of a more or less stringent character had been introduced, the most severe being the boiling test. There were various methods of carrying out this test, but the most rational and severe was that known as the Le Chatelier method. The great success that attended the early efforts to construct with Portland cement concrete reinforced with iron or steel, had led in the last few years to great advances in this mode of construction. These structures combined lightness, graceful lines, and fire-resisting qualities, as had been demonstrated often in actual conflagrations, as in the great fire at Antwerp, where it was further shown that $\frac{3}{4}$ -in. to 1-in. concrete surrounding the steel bars was sufficient to prevent any ill effects. Ferro-concrete had been rightly described as a new material—as an example of which it might be mentioned that ferro-concrete beams showed under test ten times the elongation without showing any cracks or sign of disintegration that a similar beam of concrete only would give. Buildings constructed on this system showed great absence of vibration where high speed machinery was in use, owing to the monolithic nature of the structure, in which every part was solidly bonded to every other part, from foundations to roof, without a single joint bolted, riveted, or otherwise. This fact also made these buildings very sanitary, as no rodents or microbes could attack the material or find harbourage therein.

The lecture was very fully illustrated with a fine series of pictures showing the actual process of manufacture from the raw material to the finished cement ready for use.

M. De Vesian followed with an interesting series of pictures of examples of constructions in ferro-concrete. These included pictures of bridges at Rochdale, Liverpool, and Clitheroe; grain silos at Swansea; storage sheds on the Ship Canal at Manchester, and for the Great Western Railway at the Royal Albert Dock, London, and at Bristol; a chocolate factory in France; a macaroni factory in Italy; and a variety of other buildings, principally on the Continent.

The President proposed a vote of thanks to Mr. Bamber for his lecture, and to M. de Vesian for the illustrations of ferro-concrete work. He said when the pictures of the Associated Portland Cement Manufacturers' Works were shown on the screen he could not help his memory going back some fifteen years when he went through some cement works. Then he was very nearly choked with dust, and covered with the same material, but that evening they had seen all the processes of manufacture without any of those inconveniences. Curiously enough, on the previous Wednesday he was at Liverpool, and saw there the Burlington-street bridge, which M. De Vesian had shown on the screen. That bridge had been constructed under the supervision of the City Engineer of Liverpool, and when he visited it one half of the bridge was open to traffic, and carrying heavy vehicles, while the other half was still under construction. In ferro-concrete they had a combination of two very strong materials—steel and concrete, and he thought they were approaching a new era in construction work—the era of ferro-concrete.

The vote of thanks having been passed, Mr. Bamber, in reply, said the illustrations of ferro-concrete work had been of great interest

to himself. We were very conservative in these matters in England, and it was a pity we had allowed the foreigners to get so far ahead of us in this new form of construction. It was an economical material, and one which showed greater stability than the old forms of construction.

THE CITY OF LONDON DIRECTORY.

THE thirty-fifth annual edition of the City of London Directory has just been issued by Messrs. W. H. & L. Collingridge, 148 and 149, Aldersgate-street, E.C. It has been revised and brought up to date, and the present issue, besides containing information concerning the City Corporation, the Committees, the City Officials, and the Livery Companies, gives the London County Council Committees. The work contains the following sections:—The Official, Educational, Livery Companies (i.e., the names and addresses of the Masters and Courts of Assistants, engravings of the Arms, historical accounts of the Companies, their ancient powers and present privileges, particulars of Fees and their Charities, etc.); streets (the positions of the fire hydrants, pillar letter-boxes, and public telephone call offices are shown); Biographical, and Public Companies. There is an alphabetical list giving the name, address, and trade or profession of every person or firm in the City and a trades guide, classified under the various trades or professions. The directory includes an excellent coloured map, and the price of the work, which is an admirable publication of its kind, is 12s. 6d.

THE BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

THE twenty-seventh annual dinner of the Builders' Clerks' Benevolent Institution was held on Tuesday in the King's Hall, Holborn Restaurant, W.C., Mr. James Carmichael, President, in the chair, supported by Messrs. G. Appleton, E. Brooks (Hon. Treasurer), H. Chatfield Clarke, J. Clayton, J. Howard Colls, D. Duff, J. S. Gibson, G. R. Grant, F. Higgs (President London Master Builders' Association), J. C. Hill, Henry Holloway, J. P. C. Val Hunter, D. W. McInnes, C. R. Mabey, F. G. Winter, W. Phillips, A. Ritchie, J. P. C. C., W. Woodward, J. Austin (Secretary), and the following members of the Committee—Messrs. Amphlett, Clarke, Desch, Gammon, Hadland, Mackness, Newling, Oldham, Parker, Stansfeld, Tarring, and Thompson; the company numbering about 460.

The loyal toasts having been honoured, Mr. J. C. Hill proposed the toast of "The Builders." There never was a time, he said, when better work was put up by the builders of London. We hear a good deal about the excellence of old work, but if we pull down old buildings we find that there is very little work in them, from foundations to roof, which would compare with the work done by the London builder of to-day. The building trade was a very honourable one, but it was a business the responsibility of which was very great. There were difficulties of foundations, light and air, and the difficulties of carrying out buildings to the designs that were given him, as well as the difficulties of labour; and last, but not least, the difficulty of making the job pay.

Mr. F. Higgs, who responded, said that Mr. Hill had referred to Cain as the builder of the first city, but he (the speaker) did not think that Cain had to deal with the difficulties which the British working-man give rise to to-day. There was a tendency on the part of the British workman to wheel a barrow, for instance, as nearly empty as possible. There were all sorts of difficulties which Cain had not to contend with. He expected that Cain was his own architect. Certainly he was his own clerk of works. All builders wished the Institution the greatest prosperity.

The President then gave the toast of the evening, "The Builders' Clerks' Benevolent Institution." They were there, he said, to further the best interests of the Builders' Clerks' Benevolent Institution. The ultimate success of the evening would depend not on the numbers present, but on the way in which they assisted that deserving Institution. On looking over last year's report, he saw that the Institution sought to relieve widows and orphans of builders' clerks, and also those who were described as decayed clerks. As to the widows and orphans, he was quite sure that those

present were much too gallant to make it necessary for him to adduce any argument on behalf of the widows and orphans. It might be said that builders' clerks and others get married too early; that might be so in some particular case, but, speaking broadly, he did not agree. There was no finer discipline in youth than enforced economy and practical self-denial, and he who learnt this lesson early in life had not only learnt a good moral lesson, but he had laid a sure foundation for a successful business career. The decayed clerk was a pathetic figure. In these days of rush and keen competition, there was scant consideration given to the decayed clerk, and when he lost his situation by causes over which he had no control he met with many rebuffs, and often found it hard to get another situation, the cry being for young men. He had a strong regard for builders' clerks, because he had been so well served by them. He could not help repeating what he said on a former occasion—i.e., that what little success he had experienced in business had been to a large extent due to the fact that he had been able to employ in the office and out of it better men than himself. He hoped that none of his staff would ever be compelled to seek the aid of the Institution, but, if they did, he hoped that the Institution would be in a better condition than it is to-day. He regretted to say that there were half-a-dozen eligible candidates who could not be admitted owing to lack of funds, and he hoped those present would do their duty by helping their less fortunate brethren.

Mr. E. Brooks, Treasurer, in reply, said they wanted the builders' clerks to help the Institution more than they did. If builders' clerks generally helped them more, the Institution would not have six candidates who were eligible unable to get assistance for wants of fund.

Mr. Henry Holloway then proposed, "The Architects and Surveyors." As to the great advancement which had been made in London architecture, at any rate, during the last few years, he said he had recently paid to America, that during a visit he had recently paid to America. He found there a number of his fellow-countrymen who had gone there years ago, and they were very proud of their work, and in the matter of bulk they certainly, in many American cities, beat us. In talking to his fellow-countrymen in America, he found that they were judging London architecture from what they knew of it some thirty years ago, and he advised them to come and see it to-day. He had recently had one visit from an American builder, who admitted that immense improvements had taken place in London building since he left London twenty-five or thirty years ago. He had heard similar views expressed by men who had returned to the old country, and those who had been absent from London for a long time had better able to appreciate the change that has taken place and the improvement in our architecture than we who are living in London to-day. London architects were doing a great work in beautifying our beautiful old city.

Mr. H. Chatfield Clarke, whose name was associated with the toast, replied, remarking that architects and surveyors greatly claiated the work of builders' clerks. As architects, he believed that they were doing their best in laying out large portions of the city and in designing the new buildings which were being erected in the new streets and were being made. They were doing their best to make buildings worthy of the greatness of the world, and he believed that they had made in construction, and in design they had made great advances in recent years. He thought it great advances in recent years. He thought it would be a great mistake for the idea to get about that architects were opposed to proper restrictions in building or to proper provisions for the protection of life from fire or otherwise. Architects were as deeply interested as any public body in the city in getting the best building and the best provision for escape in case of fire in the city for which they felt such a pride. It had only been recently, through having a certain Bill brought before Parliament, they felt that their clients' rights had not been properly protected, that they and others had raised their voices, with the results which were well known to the fire clauses of the Building Act Amendment Bill, ever; architect would aid in the fire clauses for the protection of life from fire. An important question affecting architects had just been discussed in the Law Courts—i.e., as to whom the drawings prepared by the architect belonged. That had always been a tender question. In view of the de-

of Appeal—and as it was the Court of Appeal one spoke with great respect—architects now had to give their drawings up to the building owner. He felt that that decision was not a logical decision, bearing in mind the architect was architect did. The work of the architect was to produce a building, and the actual data with which he produced it did not belong to the client. They might as well say that the tailor who made the pattern for a coat must give up that pattern if called upon to do so. They did not want the pattern, but if they did, it would not belong to them, but if they did, the matter would be further considered. Architects had been greatly aided recently by the House of Lords' decision which Mr. Colls had obtained in regard to the law of ancient light, and they owed a deep debt of gratitude to Mr. Colls. Before that decision it was practically impossible to raise three bricks upon another without someone objecting. Now we had a reasonable decision, and, if the course of procedure in light and air matters was slightly altered, as he believed it would be, and for which a Bill was now deposited in the House of Commons, he believed they would be able to work more pleasantly and without doing harm to their neighbours, and that, of course, was what they wanted to do.

The concluding toasts were:—"The President," ably proposed by Mr. A. Ritchie, J.P., C.C.; "The Past Presidents," proposed by Mr. J. S. Gibson, and acknowledged by Mr. F. G. Minter; and "The Visitors and Merchants," proposed by Mr. H. W. Parker and responded to by Mr. A. Gibson.

During the evening, subscriptions to the amount of 745s. were announced, including 10 guineas from Mr. Carmichael and ten guineas each from the following—i.e., the Institute of Builders, Mr. H. Chatfield Clarke, Messrs. G. Trollope, and Colls & Sons, Messrs. Farquharson Bros. & Co., Messrs. Kirk & Randall, and Mr. W. Culling Anderson.

THE INCORPORATED INSTITUTE OF BRITISH DECORATORS.

THE annual dinner of this Institute was held on Monday, in the Oak Room, Trocadero Restaurant, Piccadilly Circus, W., Mr. J. D. Grace, President, in the chair. There were also present: Sir Robert Cranston, Lord Provost of Edinburgh; Mr. H. Vigurs Harris, President of the National Association of Master Painters of England and Wales; Mr. M. E. Dockrell, President of the National Association of Master Painters of Ireland; and Messrs. W. W. Bridges, W. Callingham, H. Chatfield Clarke, J. Clark, M. Cowtan, Cowtan, W. F. Dobie, F. G. Dear, H. Phillips Fletcher, T. W. Heath, J. Higson, J. P. F. de Jong, J. Sibthorpe, J. C. Simpson, E. G. Simpson, W. G. Sutherland, J. H. Turner, J. C. M. Vaughan, and F. W. Englefield, secretary, and others.

The loyal toasts having been honoured, Mr. Sutherland proposed "The Institute of British Decorators." The Institute, he said, was the result of an effort made some six years ago, though as long as eleven years ago it was promulgated by the late Mr. Thomas Bonnar, of Edinburgh. Mr. Bonnar was a man who had large ideas and broad views of the possibilities of the decorators' trade and the claims which it had upon the members of the craft and the public, and it was the outcome of the views Mr. Bonnar put before a meeting in Manchester in 1894 that some five years later the Institute was founded. If they had not realised all that they set out to accomplish, they had not given up the hope of doing so, and they had been very fortunate in having as their guide, philosopher, and friend their President, Mr. Grace. They had never called upon the resources of energy and experience which Mr. Grace possessed without getting a full and hearty response. He thought they should, as an Institute, take some step forward in the way of aggressive action, for in the last twelve months they had been rather quiet. In former years, both in the northern section and the central section they had had a series of lectures which were beneficial to the calling which they represented, but last year this had not been continued except in Scotland and Ireland. In the central and northern districts they should develop the scheme of lectures, and he was able to say that the matter had been before the northern district, and no doubt it would come before the council in a short time. The aims of the Institute were not quite the same as those of the National Association. In the Association they dealt with those practical

matters affecting the painters' craft, but the Institute was started to direct the decorative trades in the highest channels, and to represent those who were engaged in the decorative art side of the craft. In that they had succeeded to some extent, and the trade valued the Institute, even although it had not accomplished all it might hope to do. They were gaining experience year by year, and they hoped to make some mark on contemporary life and work.

The President, in response, said it was true that the Institute, in its very short life, had not accomplished all that Mr. Bonnar hoped for it, but he did not think that Mr. Bonnar limited his hopes of the realisation of his ideas to five or six years. It was rather a pathetic circumstance that Mr. Bonnar's life ended within two days of the Incorporation of the Institute, but they would always remember that they were indebted to him for the initiation of the idea and the general motive with which he started. As Mr. Sutherland explained, the National Association and the Institute had objects which were partly the same but which diverge a little. The National Association was really founded with the idea of promoting all that tends to the benefit and the regulation of the trade itself, while the Institute aims at those matters which were rather outside what one would call trade interests, and were connected with the art and the methods of practice and the questions which did not directly relate to the profits of a business concern. The higher they could fix their aims and make their practice the better would the standard of all the members be.

Mr. Grace then proposed the toast of "The National Association of Master Painters of England and Wales, the National Association for Scotland, and the National Association for Ireland." He said that these Associations had done much to bring together and promote the best interests of the craft, and had assisted the younger generation—the men who were to succeed them—and he was glad of the opportunity of saying how much those efforts were appreciated in the Institute. Mr. Sutherland had not made any allusion to the large part which he had had in starting both the Association and the Institute, but the members knew, and did not forget. He regretted that the President of the National Association for Scotland had been prevented at the last moment from coming to London for the occasion, but that Association was well represented. It said a good deal for the vitality of the Institute that these gentlemen came so far in order to keep in touch with them.

Mr. H. Vigurs Harris, President of the National Association of Painters of England and Wales, in reply, said he had found in going among the various Associations a growing and deepening sense of responsibility and a vitality which was extremely encouraging to anyone who occupied the Presidential chair for a year. They should take a serious view of their trade, and the more they did and the more they thought of the interests which were laid upon them as masters, the more cheerful and agreeable would their calling be. It was when they had a contempt for their daily occupation that life became cheerless and a dull monotony; but he had seen no signs of that contempt on the part of the members of the Associations. Everywhere there was a feeling of hope, and he doubted whether there was a trade or profession anywhere at the present time which had so much hopefulness in its ranks. If they did not take themselves seriously, they could not expect their clients or the public to do so, and if in trade affairs—and professional matters, for their business bordered on that of a profession—they had no ideals, and did not try to elevate their own taste and educate their employees, and if they did not bet in the various workshops a pride in the calling, it would be small wonder if the public had a contempt for them and their work. The speaker, having referred to the great indebtedness of the calling to Mr. Grace, said that a master house painter did not justify his existence by making a profit out of his business; he justified himself when he carried on his business as artistically and soundly and thoroughly as he could. The National Association had devoted itself to the purpose of raising not only the ideal, but to make the realisation of the ideal more possible within the ranks of house painters throughout the country, and they had devoted themselves to the idea that the next generation of craftsmen would be greatly superior to those of the present day, and considerable attention was consequently being given to the education of the boy.

Mr. W. F. Dobie, in responding for the Scotch Association, said it had exactly the same ideas as the English ones. One endeavour of the Scotch Association was to elevate the business of the house painter, etc., in every way they could. An important matter came up for consideration at the Edinburgh meeting, when a paper was read on the subject of adulteration of materials, and that matter had been exercising the thoughts of many of them, and was one which required the very earnest attention of all the Associations. It was a question which might even be taken up with advantage by the Institute itself, for there was serious adulteration of nearly every colour material they used.

Mr. Dockrell suitably responded for the Irish Association.

Mr. Grace, the President, then proposed the health of Mr. John Sibthorpe, one of the Vice-Presidents of the Institute and a member of the Irish District Committee, and those associated with him in the organisation and carrying out of a trip to Italy of several members of the Institute for the study of important works of decorative art there.

Mr. Sibthorpe made a suitable reply, giving a short account of the experiences of his party in Italy.

The President also proposed the health of "The Visitors," which was humorously replied to by Sir Robert Cranston (Lord Provost of Edinburgh) and Mr. Hugh Stannus.

Mr. Frank Cowtan proposed the health of the Secretary, which was replied to by Mr. Englefield.

On Tuesday morning a party of the members met in the Italian Court of the South Kensington Museum and were conducted by Mr. Kendrick, one of the officers of the Museum, to view the coloured models of Italian decoration, the old English panelled rooms, and other interesting examples. They were subsequently taken to the Library, where the beautiful collection of coloured drawings by Gruner, Fox, and others, from ancient examples of decoration, were displayed for their advantage by the librarians.

The annual general meeting of the Institute was held the same afternoon in Painters' Hall.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday, in the County Hall, Spring-gardens, S.W., Mr. E. A. Cornwall, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Camberwell Borough Council £22,637s. for paving works, and Hackney Borough Council £11,083s. for electric lighting and street lighting.

Payments Under Contracts.—The General Purposes Committee recommended, and it was agreed—

"(a) That paragraph 4 of standing order No. 217 be rescinded.

"(b) That the following be substituted for paragraph 4 of standing order No. 217:—

The foregoing system of payments shall not apply to contracts for machinery or contracts for electric lighting installations, and in such cases payments shall be made as follows:—

In contracts for machinery—50 per cent. on delivery of the machinery; 25 per cent. after it has been erected; 15 per cent. after the trial or testing of the machinery; the balance after the expiration of the prescribed period of maintenance.

In contracts for electric light installations—80 per cent. of the contract price (less extras) on the completion of the work; the balance after the expiration of the prescribed period of maintenance."

Repairs to Buildings on a Printed Schedule of Prices.—The following recommendations of the Education Committee were agreed to:—

"(a) That the offer of Messrs. Marsland & Sons to continue to execute repairs to school buildings in groups 3 and 4 (Southwark district) at their present contract rates, pending the acceptance of fresh tenders for the execution of the work in the whole of the county, be accepted.

"(b) That the offer of Mr. M. Pearson, the contractor for executing repairs to schools in group 3 (Marylebone district), to undertake, temporarily, the work of executing repairs to schools in groups 1 and 2 (Marylebone district), at an addition of 15 per cent. on the printed schedule of prices for (a) measured work, (b) sanitary work, and (c) day work, as from March 24, 1905, pending the acceptance of fresh tenders for the execution of the work in the whole of the county, be accepted."

Non-Provided Schools.—The following recommendation of the same Committee was agreed to:—

"That a statement of the facts with reference to the condition of the Park Chapel (N.) school, (B), King's-road; (G) Park-walk; and (I) Camera-square (Chelsea) be communicated to the managers of the school; and that they be informed that, in the opinion of the Council, the premises are unsuitable, from the point of view of structure, for the purposes of elementary education, and

that the Council will feel it necessary to submit a statement of the facts to the Board of Education."

Tramways.—The Highways Committee recommended—

(a) That an underground conduit system of electrical traction, similar to that approved by the Board of Trade in its letter, dated January 7, 1905, for use on certain portions of the Council's (Northern) Tramways, be adopted for the construction of the tramways in Defoe-road, Garrat-lane, South-street, Red Lion-street, and York-road, being part of tramway No. 12 authorised by the London County Council (Tramways and Improvements) Act, 1901, and for the reconstruction of so much of the tramways acquired from the late South London Tramways Company as are situated in North-street, York-road, Battersea Park-road, Nine Elms-lane, Wandsworth-road, Albert Embankment, Lambeth Palace-road, Stangate, Lambeth-road (between Lambeth-bridge and St. George's-circus), and Falcon-road (between Clapham Junction and York-road); and that the necessary drawings and description of the system be submitted to the Board of Trade for its approval, and to the Councils of the Metropolitan Boroughs of Battersea, Lambeth, Southwark, and Wandsworth, in accordance with the provisions of the London County Tramways (Electrical Power) Act, 1900, and the London County Council (Tramways and Improvements) Act, 1901.

(b) That the estimate of 351,900*l.*, submitted by the Finance Committee, be approved.

The recommendations were agreed to after discussion and the defeat of a motion to refer the matter back.

Street Widening.—The Improvements Committee recommended, and it was agreed—

"That the estimate of 10,500*l.*, submitted by the Finance Committee, be approved; that consent be given under section 72 of the Metropolitan Management Amendment Act, 1862, to the widening of Church-street, Stoke Newington, between Nos. 10 to 40 (even numbers), to be undertaken by the Council of the Metropolitan Borough of Stoke Newington in accordance with the plan presented to the Improvements Committee; that a contribution be made on the usual conditions, half the net cost of the improvement, provided, however, (i.) that if the total net cost exceed 21,000*l.*, the Council's contribution shall be limited to 10,500*l.*, and (ii.) that in the execution of the improvement no departure whatever be made from the approved plan, except with the previous sanction of the Council."

Sewage Polluted Watercress.—The following recommendations of the Public Health Committee were agreed to:—

"That the report by the medical officer, to which are appended reports by the chemist and Dr. Houston, of watercress and watercress beds in the neighbourhood of London be published, and that copies thereof be placed on sale; that a copy be sent to the Local Government Board, with an intimation that the Council will be prepared to submit for the consideration of the Board details of the localities referred to in the report, should the Board desire this information; and that a copy be also sent to each of the metropolitan borough councils."

Pier Contract No. 1.—*Sub-letting.*—The Rivers Committee recommended, and it was agreed—

"That the Westminster Construction Company, Limited, be allowed to sub-let the under-mentioned portions of the work in connexion with the contract for the construction of new piers at Hammersmith and Millwall and the partial reconstruction of the piers at Putney and Wandsworth to the firms hereinafter referred to, or to such other person or firm as may be approved by the engineer, under the contract, namely, (1) the construction and supply of the pontoons, etc., to Messrs. J. L. Thornycroft & Co., Limited, Chiswick; and (2) the dredging to the Tilbury Contracting and Dredging Company, Limited."

Manor Asylum.—It was agreed to erect an isolation hospital, disinfecting house, and apparatus, at Manor Asylum, at an estimated cost of 3,800*l.*

London Building Acts Amendment.—The Building Act Committee brought up the following report:—

"We have considered as to the course which it is advisable to take with regard to the provisions contained in the parts of the London Building Acts (Amendment) Bill, 1905, which have been withdrawn. The Council will remember that, as the result of a compromise arrived at on March 14, 1905, at the House of Commons, between the members of Parliament in charge of the London Building Acts (Amendment) Bill, and of the City of London (Escape from Fire) Bill, and other opponents of the Council's Bill, it was agreed to drop all parts of the Council's Bill with the exception of Part VIII. (Means of Escape from Fire). Many of the suggested amendments which have thus been withdrawn not only affect the work of other committees of the Council, but in our opinion are quite as necessary in the public interest as those relating to escape from fire. We therefore think that the Council will desire that every effort should be made to introduce in the session of 1906 a Bill dealing with the more necessary amendments."

The Council has always welcomed suggestions, or criticisms of its proposals, for the amendment of the London Building Acts, and we have no doubt that it will wish that advantage should be taken of the opportunity, which is afforded by the withdrawal of the majority of the suggested amendments, of fully considering the views of the various bodies concerned, even though the adoption of this course may prevent us from introducing our proposals in time to enable the Parliamentary Committee to have all of them before the summer recess. Moreover, as many of the provisions in the Bill introduced in the present session will form the basis of any future Bill for the amendment of the London Building Acts, and these provisions have been considered in detail by the Parliamentary Committee, it appears to us that the standing orders relating to legislative proposals may be considered as not strictly applicable, or in any event that the Council would consider it a case in which, if necessary, some indulgence should be granted. The Bill which was introduced in the present session has been since the beginning of the year, before the Corporation of the City of London, the Councils of the Metropolitan Boroughs,

and various professional and other bodies, but as some of the amendments are dealt with by reference to sections in the Act of 1894, it has been stated that difficulty is experienced in understanding them.

In order to remove this difficulty the Parliamentary Committee, at our suggestion, have instructions for the preparation of a document showing the effect of the Bill on the existing Acts, and we are of opinion that a copy of this document should be sent to the various bodies concerned with an intimation that the Council will be glad to consider any observations which they may wish to make on the Council's proposals, or any additional suggestions for the amendment of the London Building Acts. These observations ought, if possible, to be considered before the summer recess, and it would therefore seem desirable that the Council should fix June 10, 1905, as the last day for the submission of observations. It is hoped that all the bodies concerned will co-operate with the Council in an earnest endeavour to introduce in the next session of Parliament a Bill containing all necessary amendments to the London Building Acts. It is very probable that many persons will want a considerable number of copies of the document which was prepared by the Parliamentary Committee, and we therefore propose that it should be placed on sale. We also think that a very useful purpose would be served if a memorandum on the same lines as the one which has already been sent to the members of the Council explaining in general terms the nature of the suggested amendments were sent to each member of the various bodies to whom the Bill will be sent. We recommend that with a view to the introduction in the session of 1906 of a bill to amend the London Building Acts, copies of the document prepared by the Parliamentary Committee showing the effect of the London Building Acts (Amendment) Bill, 1905, on the existing Acts be sent to the Corporation of the City of London, the Councils of the Metropolitan Boroughs, and the various professional and other bodies concerned, with an intimation that the Council would be glad to be acquainted before June 10, 1905, with any observations which they may wish to make on the suggested amendments to the London Building Acts."

The recommendation was agreed to.

Artizans' Dwellings.—Replying to questions as to the progress of the housing scheme at Tottenham,

Mr. Sears, Chairman of the Housing Committee, stated that no elementary school had been provided for the children of the tenants, and the principal market was some distance away from the houses. He hoped, however, that the Council would soon build the necessary shops. The tenants had to pay rates direct, because the local authority would not agree to compounding. The houses now built covered 5 acres, 14 houses had been built, and 31 were occupied. The rents charged ranged from 5*s.* 6*d.* per week to 9*s.* 3*d.*, and the rates to be paid amounted to 1*s.* 6*d.* and 2*s.* 9*d.* per week. The cost of the cottages was 36,000*l.*

The Council, having transacted other business, adjourned.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Westminster.—A one-story shop upon part of the forecourt of No. 121, Victoria-street, Westminster (Mr. A. C. Forrester for Mr. F. Hazell).—Consent.

Woolwich.—A Wesleyan church, to be known as the Walford Green Memorial Church, on the west side of Westmount-road, Eltham Park, between Earls-hill-road and Eltham-road (Messrs. Gordon & Gunton).—Consent.

Clapham.—A porch at No. 32, Rodenhurst-road, Balham (Mr. T. J. Lynes).—Consent.

Fulham.—An iron balcony at Lillie Bridge-mews, Seagrave-road, Fulham (Mr. W. Hancock for Messrs. C. R. Rolls & Co.).—Consent.

Kensington, South.—The retention of a wood and iron shed on part of the forecourt of No. 3, Pembroke-villas, Kensington (Mr. F. C. H. Safford).—Consent.

Paddington, South.—The retention of a show-case at the "Junction Arms" public-house, No. 23, Princes-street, Paddington (Mrs. J. Hunt).—Consent.

Strand.—A balcony at the second floor of Nos. 24 and 25, St. James's-street, St. James's (Mr. F. E. Williams for Mr. W. C. Cutler).—Consent.

Strand.—Balconies at the second, third, and fourth floors of No. 23, St. James's-street, St. James's (Messrs. H. H. & M. E. Collins for Mr. W. A. Brigg).—Consent.

Strand.—Balconies at the second, third, and fourth floors of Nos. 26 and 27, St. James's-street, St. James's (Messrs. H. H. & M. E. Collins for Messrs. Hanting & Son).—Consent.

Wandsworth.—A wooden hood at "The Marguerites," Elmira-street, Wandsworth (Messrs. Read & Wilkinson for Mr. C. O. Potter).—Consent.

Westminster.—An addition to the Westminster Technical Institute, Vincent-square, Westminster (Mr. P. N. Ginhnam for the Education Committee of the Council).—Consent.

Westminster.—A covered entrance in front of No. 32, Vincent-square, Westminster (Mr. R. S. Ayling for Miss E. Murray Smith).—Consent.

Chelsea.—An iron and glass shelter at the main entrance to the Cadogan Hotel, Sloane-street, Chelsea (Messrs. Brown & Barrow for Mr. T. W. Lassam).—Refused.

Dulwich.—Buildings at the rear of No. 117, Lordship-lane, Dulwich, to abut upon Shawbury-road (Messrs. H. Wakeford & Sons for Mr. W. Morton).—Refused.

Hammersmith.—The retention of a projecting sign at No. 22a, King-street, Hammersmith (Messrs. Davies & Co. for Messrs. Levy & Co.).—Refused.

Hammersmith.—A one-story building at the rear of No. 23, Kenmont-terrace, Harrow-road, Hammersmith, to abut upon Letchford-gardens (Mr. G. A. Sexton for Mr. Winter).—Refused.

Fulham.—A deviation from the plan approved as regards the lines of frontage of Baron's Court Station, Gliddon-road, and Margrave-gardens, Fulham (Mr. G. Estall for the Metropolitan District Railway Company).—Consent.

Width of Way

Woolwich.—A one-story building at the rear of No. 1, Thomas-street, Woolwich, to abut upon Love-lane (Mr. J. O. Cook for Messrs. Hodgson & Morgan).—Consent.

Peckham.—A two-story building on a site between No. 27 and 23, Stafford-street, Peckham (Messrs. F. Ward & Sons for Mellins Food Company).—Consent.

Width of Way and Lines of Frontage.

Peckham.—Two houses on the west side of Rye Hill-park, Peckham, north-east of No. 42, Mount Hill, Wheat, & Luker for Mr. C. Goddard Clarke).—Consent.

Bow and Bromley.—A urinal and infants' offices at the Alton-street school (Mr. T. J. Bailey for the Education Committee of the Council).—Consent.

Kensington, South.—A one-story addition at the rear of No. 43, High-street, Notting Hill, to abut upon Uxbridge-street and Newcombe-street (Messrs. C. Bell, Withers, & Meredith for Messrs. Boots, Ltd.).—Consent.

Southwark, West.—A building on a site abutting upon the north-western side of Lambeth-road and southern side of Barbel-street (Messrs. H. F. Tasker & Slater for a community Roman Catholic charitable ladies).—Refused.

Islington, South.—Buildings upon the sites of Nos. 36 and 37, P. place, Islington, to abut also upon Norfolk-street (Mr. H. S. West for Messrs. West & Co. and Mr. C. King).—Refused.

Wandsworth.—One-story shops upon the forecourts of Nos. 1 and 2, Tottenham, and Nos. 1, 2, 3, 4, 5, and 6, High Street-new, Tooting (Messrs. D. Young & Co. for Mr. E. Everitt).—Refused.

Lines of Frontage and Construction.

Islington, East.—The retention of a potting-shed at No. 2, Highbury New-park, abutting upon Highbury-grove, Islington (Mr. T. G. Walker).—Consent.

Lines of Frontage and Space at Rear.

Paddington, North.—A deviation from the plans approved for the erection of buildings on the north side of Harrow-road, Paddington, the north side of Harrow-road, so far as relates to the westward of No. 474, so far as relates to the erection of the back additions of the buildings (Mr. J. H. Bethel for the London and South Western Bank, Ltd.).—Consent.

Formation of Streets.

St. Pancras, North.—That an order be issued to Messrs. Thurgood & Martin sanctioning the formation or laying-out of new streets for carriage traffic upon the Brookfield estate, Highgate, to lead out of Swains-lane, St. Albans-road, and Croftdown-road (for Mr. W. Burdett Catts, M.P.).—Consent.

Means of Escape at Top of High Buildings and Projections.

Strand.—That Mr. W. Woodward be informed that the Council has considered the balcony and sixth floor plans and section A.B. submitted by him for Messrs. Rowland Ward & Co., showing the means of escape in case of fire proposed to be provided on the sixth (top) story of Nos. 166, 167, and 168, Piccadilly, and that upon completion to the satisfaction of the Council of the said means of escape, the Council will issue a certificate under the Act.—Agreed.

Strand.—Projecting oriel windows and balcony to Nos. 166 to 173, Piccadilly (Mr. W. Woodward).—Consent.

Deviations from Certified Plans.

Margate, East.—Deviations from the plan certified by the District Surveyor, under the provision 43 of the Act, so far as relates to the proposed rebuilding of No. 130, Great Portland-street, St. Marylebone (Mr. F. Foster for Mr. A. Rozier).—Consent.

St. George, Hanover-square.—Certain deviations from the plans certified by the District Surveyor, so far as relates to the proposed rebuilding of Nos. 175 and 176, New Bond-street, St. George, Hanover-square (Mr. A. M. Ridge for Messrs. A. Tooth & Sons).—Consent.

Means of Escape at Top of High Buildings.

St. George, Hanover-square.—Means of escape in case of fire proposed to be provided in pursuance of section 63 of the Act on the fifth floor of Nos. 6 and 7, George-street, Hanover-square, the upper surface of the floor of each story is above 60 ft. from the street level, for the persons dwelling or employed therein (Mr. C. H. Worley).—Consent.

The recommendations marked + are contrary to the views of the local authority.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—A meeting of the Edinburgh Architectural Association was held on the 29th ult. in the rooms of the Association, 117, George-street.—Mr. J. T. Baillie presiding. The Chairman made reference to the loss which the Association had sustained in the death of Mr. George Henderson. He said that the work which Mr. Henderson did, at home and abroad, far and near, diversified and varied as it was in character and style, was always marked by scholarly as well as practical knowledge, and by well-trained taste; and the lasting results were things of beauty and usefulness, monuments of his own skill, and examples and models for the instruction of others.—Votes of thanks were awarded to the convener and members of the County Council of Mid-Lothian for permission to visit the new County Buildings, and to Messrs. John Ritchie & Co. for facilities granted for inspecting *The Scotsman* new offices. Thereafter Councillor McArthur delivered a lecture entitled "The Royal Mile—the Castle to Holyrood." Mr. McArthur gave an account of the numerous buildings of historical value to be found in the thoroughfare connecting the Castle and Holyrood. His main object, he said, was to rouse interest in the remaining links with the past, and, if possible, to do something to secure their preservation. The lecture was varied by a series of limelight views.

At a meeting of the Association in the hall, 117, George-street, Edinburgh, on the 4th inst.—Mr. J. T. Baillie, vice-president, in the chair—the subject of the statutory qualification of architects was discussed. The Chairman said the movement had been set on foot many years ago.—Mr. W. S. Cross (London) said the present position of their profession was eminently unsatisfactory, for while the work of modern architects often displayed a large amount of creative power or originality that attribute was rarely accompanied by architectural scholarship. In this respect they had much to learn from the architecture of ancient Greece and Rome. He pleaded for a higher standard of culture among architects. He dealt with the Royal Institute of British Architects, and said that in its prestige and influence it was amazing it had taken so small a part in any proposals for registration. The leading principles of the scheme of reform should include a Bill in Parliament tending to increase the prestige of the Institute, and to constitute it the examining and registration authority. The scheme would afford reasonable facilities to enable every competent architect and student to obtain registration, and would close the door of the profession to incompetent practitioners. The Institute might introduce means for the practical training of architects, and endeavour to induce Universities to create chairs of architecture, so that the profession would be raised to a status which would ensure that architects of the future would be trained and cultivated men.—Mr. G. A. T. Middleton said their aim was to put the architectural profession on the same level as the medical profession, so that no man should practise as an architect unless properly trained and properly qualified by adequate examination.—Mr. Henry F. Kerr said he doubted the practicability of the proposed compulsory registration by Act of Parliament, and that progress in raising the standard of the profession would be better made by encouraging the taking of the diploma of the Institute.—Messrs. Robertson, Ross, and McArthur commended the proposal for compulsory registration on the ground that the profession suffered grievously from the competition of untrained and unskilled men, such as masons

and joiners, who put up their door-plates and called themselves architects.

DEVON AND EXETER ARCHITECTURAL SOCIETY.

—The ninth annual meeting of the Three Towns Branch of the Devon and Exeter Architectural Society took place on Thursday evening, the 30th ult., at the Athenæum, Mr. B. Priestley Shires, Chairman of the Branch, occupying the chair. The Hon. Secretary and Treasurer (Mr. E. Coath Adams) read the annual Report and presented the balance-sheet. The Report stated that the membership had increased, but the Council regretted to have to record the decease of Mr. J. H. Dwyelle, one of their members, who always took a deep interest in the Society's work. The annual exhibition of R.I.B.A. prize drawings was held in the Athenæum, and was well attended. The Committee had also much pleasure in reporting that the special prize offered by the Council of the parent society at Exeter had this year been awarded to Mr. Harold R. S. Shires, an Associate of the Branch. The question of the memorial to the Special Works Committee of the Town Council of Plymouth on the proposed amendment to the building by-laws was still unsettled, but a hope was expressed that something would soon be accomplished. Registration of architects had now assumed practical form, and was being supported by the Royal Institute of British Architects and most of the societies allied to the Institute. Mr. A. S. Parker, past Chairman of the Branch, represents the Devon and Exeter Society on the R.I.B.A. Committee who have charge of the Bill that is being put forward for presentation to Parliament. The Treasurer's Report showed a balance in favour of the Society. Mr. B. Priestley Shires, in moving the adoption of the Reports, observed that what they wanted was a keener interest amongst the junior members of the profession, and he suggested they should use their room at the Athenæum more in the future than had been the case in the past, and by means of classes on some such subject as design a very profitable course of study might be initiated. Further, they should not forget the splendid opportunities offered by the R.I.B.A., and he hoped to see some of their junior members successfully competing for the very valuable honours that awaited those who had courage, perseverance, and a good will to work. Mr. A. S. Parker, in seconding, urged the importance of architects' registration, in which he took a very deep interest, and had the pleasure of representing Devon and Cornwall on the R.I.B.A. Committees in London dealing with the important question. The Reports were then passed. Mr. B. Priestley Shires was re-elected Chairman of the Branch. Mr. E. Coath Adams Hon. Secretary and Treasurer, and Mr. William H. May Hon. Librarian, and all the officers were thanked for their services during the past session.

ENGINEERING SOCIETIES.

THE INSTITUTION OF CIVIL ENGINEERS.—

At the ordinary meeting on Tuesday, Sir Alexander R. Binnie, vice-president in the chair, it was announced that twelve associate members had been transferred to the class of members, viz., G. Attwood, William Cooper, W. H. Hamer, Arthur Harrison, John Kirkaldy, D. C. Rattray, R. F. Thorp, C. C. Smith, H. E. Stilkee, J. O'B. Tandy, J. D. Watson, R. O. Wynne-Roberts. It was also reported that 102 candidates had been admitted as students. The monthly ballot resulted in the election of two members, viz., A. L. Forster (Newcastle-on-Tyne), R. T. Rees (Aberdare), and seventy-three associate members.

THE HOUSE OF COMMONS.—Adverting to our recent remarks upon the recommendations of the Select Committee on the ventilation of the House of Commons, we find that, in the Estimates for 1905-6, a sum of 700*l.* is appropriated for that object, together with 2,000*l.* for more efficient heating appliances, improved smoke-shafts, and the purifying of the air of the members' tea and reading rooms, and the Grand Committee-room, Westminster Hall, and 250*l.* for an improved ventilation of the lavatories. Meanwhile, as we read in the *Times*, a new method of ventilating the Press Gallery rooms in the Clock Tower wing has been designed and installed under the supervision of Mr. A. P. Patey, resident engineer. The air is extracted from the rooms through the interstices of the ornamental cornices by means of a powerful fan, set under the roof, which changes the atmosphere several times in the course of an hour.

COURT OF COMMON COUNCIL.

The usual fortnightly meeting of the Court of Common Council was held on Thursday, last week, at the Guildhall, the Lord Mayor presiding.

The City Engineer.—The Officers' and Clerks' Committee submitted the names of the following gentlemen as the selected candidates for the office of City Engineer:—Mr. W. Blair (Borough Engineer and Surveyor of St. Pancras), Mr. A. E. Collins (City Engineer, Norwich), Mr. W. Oxtoby (Borough Engineer, Camberwell), Mr. N. Scorgie (Chief Engineer, Borough of Hackney), and Mr. Frank Sumner (Borough Engineer and Surveyor, Woolwich). The election will be decided at the next Court.

Paving Works.—The Streets Committee submitted a lengthy report, recommending the repaving, etc., of a large number of City streets, and submitting for acceptance a large number of tenders. The recommendations of the Committee were agreed to. In the course of their report, the Committee also recommended that the sum of 3,488*l.* 1*l.* 2*d.* be paid in full settlement of the claims of Mr. A. Woodhouse in respect of repair of sewers and the construction of house drains. This was agreed to.

The City Mortuary.—The Sanitary Committee submitted plans of the proposed rebuilding of the portion of this building recently destroyed by fire.

Correspondence.

ARCHITECTURAL EDUCATION.

SIR,—The subject of architectural education has received so much consideration of late that any new views on the subject must be read with interest.

In this regard Mr. John Honeyman's paper, published in the *Builder* for April 1, is a little difficult to follow, inasmuch as it is headed "The Institute's New Scheme," but in reality it resolves itself into a review not of the Institute's scheme, as so ably and clearly put forth in Mr. Reginald Blomfield's paper, but into a disquisition on an anomalous state of affairs certainly not obtaining at the present time in England, whatever may be the case across the border.

In several cases Mr. Honeyman raises unnecessary difficulties, for he incorrectly quotes the length of the proposed preliminary course as outlined in Mr. Blomfield's paper. It is there clearly stated that the length of the preliminary training in a school should be two years. Why, therefore, refer to it as the "tuition which he is recommended to obtain during the preceding three years"?

This preliminary training of two years is already an accomplished fact in several centres, and on lines approximating very closely to those suggested by the Board.

It is not, however, with Mr. Honeyman's criticisms of the Institute scheme (based as these appear to be upon a misapprehension of what that scheme is, and how it is actually to be worked in practice) that I propose to deal, but with the suggestions which he himself makes, and which presumably he puts forth as being within the limit of practical working.

Throughout the whole of his paper there appears to be some confusion between what obtained in the old days of lengthy pupillage and of what should obtain in a system of preliminary school training. For instance, preliminary school training, for which it is apparently assumed that with the school training the student would only receive the same length of holiday as hitherto given with the pupillage system, and a month's holiday is recommended in the first year. May I point out that the actual and practical working of a school course could not possibly be continued throughout the year with only a month's break, but must be divided into terms with vacations of reasonable length, both for teachers and taught, and the former would certainly not thank Mr. Honeyman for his suggestion that a month's holiday is all that is required.

Everyone will surely agree with him that "the student ought to have not only enough of time for recreation, but also for sketching and measuring and visiting interesting localities." The average school course amply provides for these important subjects, giving as it does short vacations at Christmas and Easter and a long summer holiday, during which the student is encouraged to measure and study old work and generally continue his self-education. When all is said and done the real education

of the architect is never completed, and the aim of any education worthy the name is to train the student to teach himself. These vacations serve then a double purpose. They give the student an opportunity of carrying on his work without, and away from, any supervision, and they give the teacher the opportunity of discovering how far the student has been able to profit from the training he has already received in this regard.

It is a little difficult to see how a student who is advised to work nine hours daily can find time for "cricket, golf, or drill," as also suggested. It is still more difficult to see how the student in his first year's holiday is to combine sketching and measuring work with "going into the counting-house of a merchant or accountant," or how in the second summer he is to combine it with gaining "some insight into the mysteries of quantity surveying and specifications" in a surveyor's office. Surely, too, the place for specifications is in conjunction with the work in the studio, and in an architect's office.

It is equally difficult to follow Mr. Honeyman's plea for dividing the time in the fourth year between the office and school, giving four hours and a half to the former and four hours and a half or more to the latter.

How is this to be worked? The ordinary London office opens at 9.30 a.m. Is the student to work there until two o'clock, and then, having obtained his lunch and conveyed himself to a conveniently situated school by, say, three o'clock, to work there until 7.30 p.m.? What of the teachers in this case, and, incidentally, what of the office blessed, or shall we say burdened, with such a student, who relinquishes his pencil each day at two, not to return until the next morning?

But perhaps the crux of Mr. Honeyman's proposals is reached when he suggests that the architect thus blessed should keep and pay a sufficient staff to do his work without the aid of this "accomplished draughtsman." Of what value, then, is the accomplished draughtsman to his chief, be his "half-time services" ever so free? Indeed, he would be a costly appendage, inasmuch as office room would have to be provided for him, though he himself provides nothing except his partial services, which, however, are not really required!

These, then, appear to be serious difficulties, and it is hard to see how such a scheme as Mr. Honeyman proposes could be worked in practice. H. M.

"BANISTERS."

SIR,—I am grateful to Mr. Walker for his letter. I did not wish or intend to imply that the spelling, or miss-spelling of the word was surely it would be better to spell it correctly? If not, the spelling of surnames in old pedigrees might be justified on the score of antiquity, generation after generation changing it with delightful freedom and irregularity. This would hardly be thought worthy of imitation now. E. SWINFEN HARRIS.

"GEARY, WALKER & CO., LTD., v. LAWRENCE & SON."

SIR,—Permit me to point out, through the medium of your columns, that I have no connexion in any way whatever with the above-named plaintiff firm; consequently, am not concerned in this case. A. R. GEARY. (Ellis, Geary, & Co.)

139, Cannon-street, E.C.

THE LATE SAMUEL JOSEPH NICHOLL.

SIR,—May I venture to correct an unintentional and pardonable error in your otherwise admirable and most accurate obituary notice of my dear old friend, the late Samuel Joseph Nicholl, which appeared in your last issue. The great rector and altar, which fill the entire east wall of Wilson and Nicholl's church of St. Charles, Upper Ogle-street, Marylebone, were designed by the late John F. Bentley, in the late sixties; and the paintings were the work of Mr. W. H. Westlake, as I well remember (being resident in London at the time) visiting Mr. Westlake's studio with Bentley when the pictures were in hand. Unfortunately I learn that a firm of decorators have been of late allowed to varnish and seriously impair the effect of this most interesting series of paintings. CHARLES HADFIELD.

Sheffield, April 4, 1905.

"RESTORATION" AT YORK MINSTER.

SIR,—As a Freeman and resident of York, will you permit me to use your columns to

protest against the modern spirit of restoration which is, even now, despoiling and disfiguring our glorious Minster?

During the last hundred years the Minster has been "restored" to such an extent that now it is hardly possible to find an original stone on the exterior of the building.

The excuse for this rebuilding has been that the fabric was in danger, and that, therefore, it was necessary to take down the old stones, get masons to make copies of them, and put the new into the place of the old.

Whether this excuse be valid or not I leave your readers to judge.

There can be no excuse of this kind, however, for the innovations which are now being carried out on the north side of the nave. I use the word innovations advisedly, because there is absolutely no precedent for what is being done.

When the builders of the Minster began the building of the nave, it was their intention to cover it with a stone vault. The width of the space between the walls, however, seems to have so effectually frightened them, that, instead of a stone vault, they erected a roof of wood, groined and painted to look like stone. The arrangements that were made for supporting the clerestory walls with flying buttresses were abandoned on this change of plan, and on the south side of the nave are still to be seen the heavy pinnacles, each with its statue, which were erected for the purpose of resisting the thrust of these buttresses.

On the north side, however, the Archbishop's palace, built by Walter-de-Gray was still standing, and the builders, evidently thinking that this side would not be so much exposed, only carried the wall buttresses to the roof of the nave aisle. They also left this side much plainer than the south, with the result that the view of the Minster from the north is much more imposing and majestic than the one from the south. The range of the nave clerestory windows, unbroken by any pinnacles, the tall lancets of the Five Sisters' window, crowned with the square central tower, present a view which, once seen, will never be forgotten. Mr. Clutton Brook and other authorities have remarked on its dignity and beauty. Imagine our dismay when we were told that pinnacles in exact imitation of those on the south are to be placed on these north side buttresses, and that these pinnacles are to be connected to the clerestory walls with flying buttresses! Now, as I have said, the excuse of restoration cannot apply here. There is absolutely no precedent for this work.

From an artistic point of view it will break up the range of clerestory windows, while nothing will be gained, as the work is to be only an imitation. From the historic standpoint, the change is still more to be regretted. This very part of the Minster illustrates, in a most admirable manner, that Gothic spirit which could be at once so fantastic and so grand in its resources. It is as though someone who had a most beautiful and precious manuscript were, in order to show how well he could write, to introduce specimens of his penmanship on to its pages.

I hope that someone, much more able than myself, will be led to protest so strongly that the work will have to be abandoned, and the money put to better use. RICHARD HAWKINS.

York, April 4, 1905.

P.S.—Enclosed please find photo which clearly shows the buttresses above referred to.

PETITION re REPAVING OF WATERLOO BRIDGE-ROAD.

SIR,—We beg to bring to your notice that the above petition came before, and was discussed by, the Highways Committee of the Lambeth Borough Council this week, when it was decided to rescind the resolution to repave the above road with granite setts, and to carry out the work in wood as heretofore.

We have much pleasure in tendering to you the most heartfelt thanks for the kind way in which you brought our grievance before the public, and we feel that the passing of the above resolution is due, to a large extent, to the way the Press took up the question.

J. H. DEXIN.
For the residents, ratepayers, and occupants of the Waterloo Bridge-road.

GIBBON v. PEASE.

SIR,—The remark made by one of the learned judges in this case about plans of drains illustrates well the absence of knowledge of the subject they were dealing with which distinguished the court. The drain plan to which the building-owner is entitled under this judgment is the *contract* drain plan. So generally are the drains varied in execution, that, in at least nineteen cases out of twenty, such a plan would be merely mis-

leading. What the client wants, and what he usually gets already, is a plan of the drains as executed—a very different matter.

F. H. A. HARDCASTLE.

Illustrations.

THE UNITED STATES NAVAL ACADEMY, ANNAPOLIS.

OUR lithograph plates this week are entirely occupied with illustrations of the immense and stately group of buildings which the United States Government are erecting as a Naval College at Annapolis, from the designs of a well-known architect, Mr. Ernest Flagg, of New York.

The two general views give an idea of the spacious and grandiose arrangement of the buildings and of the site generally; and a geometrical plan will be found on another sheet. Unfortunately the drawings, which, as will be recognised, are exceedingly French in style, follow also the French system of giving no scale on a plan, so that we can only judge of the size of the buildings by conclusions from their proportionate relation to their surroundings.

The Academy is situated on the margin of the Severn River, with a basin in front of it partly shut in by two moles each carrying a lighthouse at its extremity. From the margin of the basin extends a central garden, with an amphitheatre of steps at the lower portion, the band-stand forming the centre of this semicircle. At the top of the garden the domed Academy chapel closes the central vista. The Academy building and the Cadets' Quarters flank the garden to right and left. Behind the Cadets' Quarters is the Memorial Hall, of the interior of which we give a view; the architectural details of this furnish to a certain extent a scale of the interior, as the view of the central entrance does for the exterior; if, that is to say, the figures are put in to the true scale.

Photographs sent to us, from which these illustrations are reproduced, are all from drawings, and a very fine set of drawings the original must have been.

In regard to the progress of the work at Annapolis, the Boat House, the Marine Engine building, and the Officers' Mess are now completed; the Cadet Quarters, Chapel, and Officers' Mess are more than half completed; and the Academy building is fast on its way.

As a general rule it is very difficult to get American architects to send illustrations of their buildings across the sea, and we feel therefore the more indebted to Mr. Flagg for his courtesy in immediately acceding to our request for some illustrations of his scheme, and sending us a set of photographs which are here reproduced.

METROPOLITAN PNEUMATIC DISTRICT.

—In response to representations made by the Corporation of the City of London and the Corporation of the County Council, the Home Secretary has expressed his opinion that the Company's proposed Bill should not be proceeded with until the Royal Commission, which now sits under consideration the question of London traffic, has presented its report, in view of the great inconvenience which will result to the inhabitants of London from so extensive an interference with the streets as is contemplated in the measure. The project envisaged the erection of a generating station near Wood Lane Farm, Shepherd's Bush, and the laying down of 12-in. tubes, in double lines, with wires, cables, etc., extending over ninety-five miles in length, and with 150 stations, for the conveyance of parcels to adopt the American system of the Batcheller Pneumatic Tube Company, and their scheme revised, in effect, when Mr. that was attempted in 1886, when Mr. Latimer Clarke and Mr. W. Ramwell, as joint engineers, laid a tunnel, constructed by Mr. John Aird, of cast iron C-shaped sections, 1 in. thick, and measuring 4 ft. by 3 ft. 6 in. beneath Newgate street, Holborn, from Court road, Tottenham Court road, New Oxford-street, Tottenham Court road, and Drummond-street, to the City of London, for carrying mails and parcels. The tunnel was situated between Whitehall and the City, and was the first of its kind in the world. The project was not maintained the vacuum system, as the desired speed of the train was not maintained, and certain mechanical defects in the tunnel.

COMPETITIONS.

LAMBETH MUNICIPAL BUILDINGS.—At the meeting of Lambeth Borough Council, on March 30, the General Purposes Committee adopted a suggestion of the Royal Institute of British Architects, agreed to exhibit the designs (with certain exceptions) submitted in the Municipal Buildings Competition, and the decision was included as part of the conditions of competition. About 170 architects have applied for copies of the conditions and plans, and have paid the 1*l.* deposit, and it is possible that 150 designs will be submitted. Each design may consist of six and eight separate plans, and as it was obvious that a considerable space would be taken up in the arrangement of the plans, both for the purposes of judging by the assessor and also for the public exhibition, the Committee had obtained the use of the Prince's Hall for the display of the designs. The report was adopted, and authority was given the Committee to make the necessary expenditure for fixing the frames and staging. The last day for sending in designs is the 15th inst.

SCHOOL, ACCRINGTON.—Messrs. Fairhurst & Holt, architects, of Blackburn, Manchester, and Liverpool, have secured the first premium of 5*l.* in the competitive designs for the new Council School near Royds-street, Accrington, to accommodate 1,000 scholars, and which is estimated to cost about 15,000*l.* The second and third premiums, 25*l.* and 10*l.* respectively, go to Messrs. Shaw, Vowles, Sproat, & Clayton, of Burnley. Messrs. Fairhurst & Holt have been entrusted with the erection of the school.

WEST ISLINGTON PUBLIC LIBRARY.—The Public Libraries Committee of Islington Borough Council reported on Wednesday last the assessor (Mr. J. Belcher, A.R.A.) had nominated Professor Beresford Pite for appointment as architect in connexion with the library to be erected in West Islington.

BOOKS RECEIVED.

A HISTORY OF ENGLISH FURNITURE: THE AGE OF OAK. By Percy Macquoid. (Lawrence & Bullen. 2*l.* 2*s.*)

PICTORIAL COMPOSITION AND THE CRITICAL JUDGMENT OF PICTURES. By Henry R. Poore. (B.T. Batsford. 7*s.* 6*d.*)

THE APPRECIATION OF SCULPTURE. By Russell Sturge. (B.T. Batsford. 7*s.* 6*d.*)

PAINTERS' OILS, COLOURS, AND VARNISHES. Edited by Paul N. Hasluck. (Cassell & Co.)

THE MECHANICAL HANDLING OF MATERIAL. By Geo. F. Zimmer, A.M.Inst.C.E. (Crosby Lockwood & Son.)

ROBERT ADAM, ARTIST AND ARCHITECT. By Percy Fitzgerald, F.S.A. (T. Fisher & Unwin.)

TRADE CATALOGUES.

Messrs. E. & R. GITTINS, of Waterloo-street, Birmingham, send us their new illustrated catalogue of metal work for ecclesiastical and domestic decoration. The photographic illustrations show remarkably good work, and many of the designs are excellent; they are more sober, and show less of the influence of the pernicious *art nouveau*, than any metal-work we have seen recently. It has been the fashion lately to twist and contort the material into vegetable and muscular forms quite unsuited to iron work. We believe that there is a real demand among architects for simple smith's metal work, the simpler the better. Where complexity is necessary or desirable, let it be of the kind to be found in the Ironwork Gallery at the South Kensington Museum. How hard is it to get a well-made thumb latch of quiet and reasonable design, or a pair of strap hinges to hang an oak door! Much of the charm of medieval domestic and church architecture lies in the smith's work, the locks, the hinges, the hearth, and its surroundings. When these things do receive attention in modern buildings, they are too often pretentious and affected to the last degree. Messrs. Gittins have evidently realised their craft with thoroughness and firmness, and we shall hope to see their catalogue improve year by year. Their subject is inexhaustible, like every craft, and it is only the craving after novelty that can do it harm.

Messrs. W. H. Birge & Sons, wallpaper manufacturers, whose headquarters are at Buffalo, U.S.A., have sent us their illustrated book of patterns for 1905, having the address of

Regent House, Regent-street, W. Many of the papers shown at this address are artistic productions of merit, fresh and pleasing in colour and design. They show ingenious combinations of patterns, which enable a room of any size to be treated in panels. Friezes are shown capable of various treatments which avoid the disagreeable monotony usually attendant on the picture frieze. The leather patterns are perfect imitations of tooled leather. If imitations must be had, the more complete the delusion the better. Some of these patterns are fine copies of the richly decorated leathers of Venice and the Middle Ages. Some of the simple bedroom papers are very bright and pretty and extraordinarily cheap. Altogether the patterns show much that is interesting or novel in wallpaper design.

Messrs. Jeffrey & Co. have sent us their new illustrated catalogue of artistic wall-papers. Their well-known papers maintain the high standard in design to which they have attained in recent years. The papers are made from the designs of such well-known decorative artists as Mr. Allan Vigers, Mr. Walter Crane, Mr. Heywood Sumner, and Mr. Lewis Day. An original landscape frieze by Mr. Neatly is shown; it is much superior to the usual class of repeating frieze. Many of the papers are arranged with a view to the decoration of rooms in panels. There are also shown some very fine reproductions of silk damasks and brocades in flock and other papers.

Messrs. William Lindsay & Co. send us their handbook of "fireproofing" and constructional steelwork. Passing over the first few pages containing photographs representing different buildings, the steelwork and "fireproofing" for which was designed, supplied, and erected by this firm, we come to particulars of a trussed fire-resisting floor, which has been used in many important public buildings. Briefly described, this system consists of rolled steel joists embedded in pumice-concrete, which is reinforced by steel rods passed over and under the joists. The main girders are also encased in concrete, so that they may be protected from the action of fire. In some cases, where spans of considerable width occur between joists, the under surface of the concrete is arched, and the ends of the transverse rods are screwed, and, being passed through the webs of the steel sections, are secured by nuts. By the use of pumice-stone a very light and tough variety of concrete is obtained, affording an excellent key for plastering, and a basis to which floor boards can be nailed. The same principle is applied to the construction of domes, mansard-roofs, and spires, and the surface of the concrete may be prepared at option for a facing of tile, slate, lead, or asphalt. Although not representing true concrete-steel construction, this system is a marked improvement on many methods of applying rolled steel and concrete. Two or three pages are next devoted to steel trough flooring, which, when filled above with concrete and suitably protected below, gives adequate resistance to fire, and is of very great strength. The remainder of the book is occupied by tables and drawings of steel stanchions and girders. We are pleased to notice that the latter are listed in accordance with the dimensions of the Engineering Standards Committee.

Messrs. Easton & Anderson send us a circular relative to the "Pluto" hot-air furnace for steam boilers, which is designed so as to secure complete combustion of the fuel at the highest obtainable temperature. The apparatus consists of air-heating pipes placed in the flues, and through which air required for combustion is drawn by means of steam-blowers and delivered through the closed ash-pit to the fire-bars. As the air is delivered at a great heat, it is claimed that the temperature of combustion is much higher than usual, and among the advantages said to be secured by the use of the furnace are saving of fuel, increase of boiler power, and perfect combustion, with consequent prevention of smoke.

We have received from Messrs. Johnson & Phillips, of Charlton, Kent, a pamphlet describing cables and junction-boxes for electric lighting. We note that they have completed large contracts for supplying and laying cables on the solid, drawn-in and armoured systems. The method they employ of armouring concentric cables is very ingenious. This type of cable can be safely laid direct in the earth. The underground main fuse box illustrated is excellently designed. For all practical purposes it may be regarded as water-tight, and

yet access can be at once obtained either for making tests or replacing fuses. No brick pit is required for the box, and there are no bolts or nuts on the cover. The pamphlet is well illustrated by photographs of the work of cable laying by this company in various parts of the country.

We have received from the Edison & Swan Company, Limited, of Queen-street, E.C., leaflets describing various novelties. The

"Ediswan Pull Type" button switch will be useful in offices and warehouses in those cases where it is inadvisable to run wires and conduits in the usual way. The switch can be fixed on a wall or on the ceiling, and can be operated by a cord. By a distinctly novel arrangement the cord actuates for both the "on" and the "off" positions of the switch. It is stated to be strong mechanically. We know of several cases where the use of a switch of this type would have appreciably lowered the cost of the installation. The "Ediswan" high voltage fuse boards are cheap and well designed, and they stock a large variety of sizes. The leaflets describe "Ediswan" fancy glass shades and globes of most extraordinary shapes and colours. Those who admire "yellow opalescent with green blobs . . ." etc., shades, will find a great variety from which to make a choice.

We have received from Messrs. Johnson & Phillips, of Old Charlton, Kent, a catalogue of their electric lighting cables and wires. The recent advances in the price of electrolytic copper and rubber have necessitated a revision of the prices of practically all the cables quoted in the catalogue. We note that the cables are all tested according to the rules of the Institution of Electrical Engineers, and are divided into three standard grades, namely, 300, 600, and 2,500 megohms. This means, for instance, that if a cable belong to the 600 megohm grade, then, no matter what its diameter may be, its insulation resistance is not less than 600 megohms per mile. We note that Matthiessen's standard is printed Matthiessen's standard throughout the catalogue. This should be corrected in the next edition.

We have received from the Electric Heating Company, London, a catalogue describing a large variety of apparatus for the utilisation of electricity for heating and cooking purposes. The electric heaters, as a rule, are provided with three terminals, by means of which a minimum, medium, and maximum degree of heat can be obtained. They work equally well with continuous and alternating current, and from the thermal point of view the radiators are well designed, the heat radiated and the heat circulated by convection currents in the air being distributed in about equal proportions. Utensils for cooking electrically have naturally a high efficiency, as the heat can be applied exactly where required. When current can be had from the supply company at a cheap rate the desirability of employing it for both cooking and heating is always worth considering. The catalogue is profusely illustrated, and sufficient data are given in all cases to enable any one to calculate the exact cost of the current consumed for the various operations.

We have received from Messrs. Alex. Boyd & Son, of New Bond-street, London, a catalogue entitled, "Electricity Domesticated." Illustrations and detailed descriptions are given of electric radiators, "heat traps," "hot tables," etc. The articles described are in many cases novel, ingenious, and inexpensive. We agree in thinking that, although owing to the present cost of electric power it can seldom be economical to heat large rooms by its means, yet for warming small rooms it is often very economical. The description given of the object of the hot shelf in the radiator is not very scientific. We are told that the "hot air is caught, kept down, and turned to account instead of rising and being wasted at the ceiling." In order that the hot air may be "turned to account," we presume that it warms a large surface which radiates heat throughout the space round the stove. In order to radiate heat well the surface must be hot, and taking the larger surface into account, it may well be questioned whether the convection currents from this surface will not be as large as if there were no hot shelf.

We have received from the Linolite Company the third edition of their catalogue. It will prove interesting to those in search of novel methods of utilising electricity for lighting purposes.

We have received from the Société Gramme,

of Gray's Inn-road, London, a leaflet describing their well-known dynamos for electroplating. These machines are also suitable for many purposes in electrochemistry. They are exceedingly well designed. Standard types of low-tension machines are kept in stock, so that quick delivery can be guaranteed. The smallest machine gives 40 amperes at a pressure of 6 volts, and the largest 1,500 amperes at the same pressure.

Messrs. Merryweather & Sons send us a catalogue they have lately issued relative to wind-pumping machinery. This pamphlet describes and illustrates some useful types of wind-driven engines and pumps, from the small windmill on a timber frame, with a single-barrel pump, to the large wind engine comprising a powerful sail wheel mounted upon a rigidly braced steel tower, and treble-barrel pumps. Machinery of this kind is already used to a considerable extent for the supply of water to country houses, farms, and villages, but deserves far more attention than it has received hitherto, as the motive power is obtainable quite free of cost. It should be noted that the towers, upon which the Merryweather windmills are mounted, are of very substantial construction so as to enable them to withstand heavy winds, and that the sails can be provided with a special automatic governing device in order to prevent damage during the prevalence of gales.

We have received from Elliott's Moulding and Joinery Company (Newbury) three catalogues containing hundreds of illustrations of mouldings for various purposes. The first is entitled "Architects' Series," and has twelve pages of outline sections of cornices, architraves, panel-mouldings, skirtings, handrails, balusters, and newels. The staircase details are not of much merit, but some of the other mouldings are good of their kind, although the compasses have been too freely used in the design of the curved members. In catalogue No. 7, which is intended for builders, the illustrations are in isometrical projection, and comprise nearly 700 examples of moulded woodwork. Catalogue No. 9 has been prepared for the use of "Cabinet-makers, Decorators, etc.," and contains about 800 examples of panel-mouldings, cornices, picture-rails, chair-rails, plinths, etc.; the members in the panel-mouldings are smaller than those in the builders' catalogue. As a whole, the catalogues may be recommended for ordinary work, although of course they contain many examples which are not satisfactory. An architect possessed of any individuality will prefer to make his own designs.

We have received from the Teale Fireplace Company three catalogues, containing illustrations of their manufactures. The original form of the Teale fireplace is already so well known that further description is unnecessary, but if the catalogues are any indication, the more popular type of grate is now the modified form with raised hearth and without front bars. Nearly all the illustrations show grates of this kind. Great praise is due to the company for the excellent character of many of the designs for mantelpieces and metalwork; they display both originality and good taste. In addition to open fires, the catalogues contain illustrations of stoves suitable for hospitals and schools, and of radiators and heating apparatus boilers.

From Messrs. Alex. Boyd & Son we have received a new and enlarged edition of their "Book of fireplaces, showing varieties of the English open fireplace." Dog-grates of various kinds are the most conspicuous feature of the book. The drawings are in line, and are not altogether satisfactory. We have also received from the same firm a pamphlet describing and illustrating their new patent ventilating fireplace, which is suitable for schools and hospitals as well as for houses and other buildings. The grate stands independently in the fireplace, and panels are inserted between it and the jambs to form a warm-air chamber. An important point is that these panels can be easily removed for the purpose of cleaning the chamber.

The St. Pancras Ironwork Co. send us a neat little catalogue describing and illustrating various types of steam motor wagons for home and colonial use. Several special features are embodied in these vehicles. The forecarriage is constructed on the rocking principle with the object of obviating twisting and jarring of the main frame. Ample boiler power is provided, and, while not of excessive weight, the boiler has enough reserve power to make it easy to keep up a good head of steam. The adoption

of a roller chain drive and cut gearing ensures comparatively quiet running, a point which certainly is a desideratum for vehicles used in cities and towns.

Messrs. Oetzmann & Co. send us a description and illustration of their "Chameleon" set of furniture, which is specially designed for those who have to live in one room, and make it a bed-sitting room. There is a neat-looking cabinet with drawers of which the upper part opens off into a washing-stand; a bed which by day forms a settee, the pillows, concealed in ornamental cases, forming sofa-cushions; and one or two other compound pieces of furniture carry out the same kind of double arrangement. The thing seems, judging from the illustrations, to be very well done and at a low price, and such a set of furniture may be a great convenience to single people of restricted means.

Messrs. Wright, Brinley, & Ge' (Sheffield) send us an illustration and description of their "Holderness" bevel-edged file, the object of which is to make the edge of the file more useful by providing a flat surface on which to cut the teeth, instead of a rounded one. In cutting the teeth on a rounded edge it is impossible to get them to a uniform depth.

Messrs. Charles Winn & Co., of Birmingham, send us a circular illustrating and describing their pipe-screwing machine of the portable type and suitable for screwing iron barrel from $\frac{1}{2}$ in. to 2 in. diameter, and bends from $\frac{1}{4}$ in. to 2 in. diameter. This is a compact and well-made machine of a general type familiar to most of our readers.

Messrs. Crosby & Co. (Farnham, Surrey) send us an illustrated catalogue of inexpensive mantelpieces made in oak, walnut and basswood. These are drawn in ink line in the rather scratchy style of drawing which seems for some reason to be considered specially "artistic" just now, and which hardly shows the objects illustrated to the best advantage; but the designs are simple and in good taste; perhaps the simplicity is rather overdone in some of them, but that is better than florid common-place.

Messrs. James Keves & Sons have sent us a copy of their well-bound catalogue of 610 pages, containing thousands of illustrations and prices of tin, iron, and japanned ware, ironmongery, outlay, and tools. Many of the goods are of no particular interest to the architect and builder, but will appeal to the householder. The section on "Brass Foundry and Ironmongery" is of more value to our readers, but even this contains such articles as dog-chains, shark-hooks, and harpoons. The index comprises over 3,000 references, and this will give a good idea of the comprehensive nature of the catalogue.

Messrs. Allan Jones & Co. (Gloucester) have sent us a small catalogue of the "Hatherley" step-ladders, tables, seats, trestles, etc. Some of the ladders are designed for the use of painters and decorators. Jones's patent automatic cupboard fastener is simple and effective.

A small catalogue containing specimens of the "Marpado sanitary washable water-paint" has been received from Messrs. John H. Fuller & Co. (Reading and London). Twenty-six different colours are shown, the "lemon chrome" being the brightest and the "terra vert" the dingiest. The makers do not say whether any of the colours are unsuitable for use on new plaster, although this is a point on which architects desire information. They inform us that they can incorporate into this paint either eucalyptus, sanitas, or carbolic acid, for the purpose of sterilising it.

Messrs. W. E. Mouldale & Co. (Liverpool) are the representatives in this country for the Huertgen "Jalousie" roof-light and ventilator. This is an ingenious combination, consisting of a glazed roof-light under which are a number of louvres; the light and louvres are hinged at the back, and are opened by gearing. When open, the appearance of the side is somewhat like that of a half-opened fan. When closed the louvres occupy very little space, and the appearance differs very little from that of an ordinary skylight. The louvres are so shaped as to exclude rain, except perhaps in strong winds.

Messrs. Pearce & Co. have sent us a supplement to their catalogue. It contains illustrations of conservatories, vinerias, etc., erected by them at various places, and also a number of testimonials. Detailed descriptions and prices are not given.

A catalogue, with coloured illustrations of tiles for floors, walls, etc., has been received from Messrs. T. & R. Boote (Burslem). The illus-

trations do not show anything particularly novel; some of the floor patterns indeed have done service for a great many years, if our memory is not at fault. The folding sheet showing various designs for ceramic mosaic is the most artistic in the book.

The C. W. Lewis' Tiles (Stockingford, Nuneaton) send us their catalogue of roofing tiles, ridges, finials, chimney-pots, etc. The prices are not given.

We have received from Messrs. E. & R. Gittens (Birmingham) a delightful catalogue of artistic metalwork, including door-furniture, gates, fire irons, grate fronts, lamps, electric light fittings, etc. We are pleased to note that the name of the designer of the metalwork, Mr. C. A. Llewellyn Roberts, is given on the title-page. Special mention may be made of a Lenten chalice, in wrought silver and ebony, but all the designs are good.

A catalogue from the same town has been sent by Messrs. James Cartland & Son. This is an abridged list of the firm's "brass foundry specialties," including fittings of various kinds for doors and windows. The firm is well known in the trade.


Messrs. Heathman & Co.'s catalogue of ladders, etc., has already been mentioned in these columns, and the new catalogue is on similar lines, but contains some additional illustrations of fire escapes, etc.

Messrs. Hardy & Palmer (Worcester) have introduced a novelty in the method of advertising their manhole covers. Three large sheets containing full-size sections of the covers have been prepared, so that architects and engineers can see at a glance the nature of the seal or joint and the thickness of the metal. On one of the sheets prices and dimensions are given for all the kinds of cover illustrated.

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE-STEEL.—XIV.

EXAMPLES OF THE COIGNET SYSTEM.

 ROM among the numerous works executed by M. Coignet, we have selected for mention in the present article three representative examples, which, together with particulars of the methods of construction usually followed, will sufficiently illustrate the distinctive features of the system adopted by this engineer.

Francois Coignet was one of the first to suggest the possibilities of concrete when suitably reinforced by iron, but, unlike Monier and other pioneers, he made no attempt to apply his theory to the design of actual structures. At a later date, however, Edmund Coignet, his son, made reinforced concrete the subject of theoretical and experimental investigation, and, in conjunction with M. de Tedesco, elaborated a complete theory, the correctness of which has been generally confirmed by subsequent experience.

The Palais de l'Exposition, which has attracted our readers had an opportunity of examining at the Paris Exposition of 1900, may be mentioned as a remarkable example of the Coignet system. That part of the structure which excited more attention than any other was the great alcove forming the principal facade. This alcove, having a height of 45 metres and a width of 25 metres over all, is supported upon a series of concrete-steel curved walls only 10 centimetres thick, carried by the reinforcement of the galleries and staircases; the lower part of the building. The semi-circular wall forming the lower portion of the interior of the alcove is also only 10 centimetres thick, but is provided with vertical reinforcing ribs 20 centimetres square. The upper portion of the alcove is composed of arched ribs covered by a concrete-steel slab 4 centimetres thick. The outer face consists of bracing and circular arched ribs connected by bracing and reinforced concrete, which is one of the few buildings still remaining to recall the last Paris Exposition, being a deserving examination by all who are interested in reinforced concrete design, but, for the purpose of the article, we prefer to illustrate two buildings of more familiar character. The first of these (Fig. 101) is the General Post Office at Oran, in Algeria, which is constructed almost entirely in concrete-steel, and the second (Fig. 102) is the Banque des Valeurs Reunies at Paris.

Boumar, Paris. In the latter building, owing to the desire of the architects not to deviate from accepted methods of design, only the columns, beams, and roofs are of concrete-steel, the walls being of stone and brick, and the two lower floors of rolled steel joists with brick panels.

The distinctive feature of walls built on the Coignet system is that they consist of three parts—uprights, lintels, and panels. The uprights and lintels are of reinforced concrete, and are connected so as to form a skeleton frame very much resembling the steel framework adopted so largely by architects in the United States. The panels between the members of the reinforced concrete skeleton are usually of the same material, but brick, stone, or other filling may be employed at the option of the designer, and, if desirable, the exterior may be faced with stone, brick, or terra-cotta, very much as brick shells are faced with stone in this country. There are no special features in connection with the foundations of walls of this type, the footings being of concrete, reinforced by longitudinal and transverse bars of

iron. Footings for columns are somewhat similar in design to the Hennebique footing illustrated by Fig. 99 in a previous series of articles.* The reinforcing bars are in two tiers near the outer surface of the concrete, the bars of the upper tier being placed transversely to those in the lower tier. The chief point of difference is that the Coignet footing is strengthened by four stiffening ribs projecting from the upper surface of the concrete and extending from the middle of the footing to, and parallel with, the sides of the rectangle.

The columns are usually of square cross section, reinforced by four vertical bars, one in each corner, and tied by horizontal hoops of thin round rods about 6 millimetres in diameter, the ends of which overlap and are firmly bound together by annealed iron wire. The horizontal hoops, or horizontal ties, are spaced about 10 centimetres apart measured vertically. Cylindrical columns are similarly constructed, and in every case provision is made for securely connecting the reinforcement of the columns with that of the floor beams.

The foregoing particulars are generally descriptive of the method of construction followed in the General Post Office at Oran, and, as the details of the beams, joists, and floors are practically the same as those in the Banque des Valeurs Industrielles in Paris, it is unnecessary to consider them separately.

From Fig. 102, it will be seen that the last-mentioned building comprises nine stories in

all, including the basement and sub-basement. The reinforced concrete work commences at the first floor, and includes the interior columns, beams, floors, and the roof.

Fig. 103 gives a transverse and a longitudinal section of a floor joist, and part of the adjoining floor slab, which really constitutes the compression flange of the beam. The reinforcing bar in the tension area of the joist here represented is 2 centimetres in diameter, and the bar in the compression area has a diameter of 1.3 centimetres. The vertical stirrups, formed of round rods, are lapped round the horizontal bars, and are intended to resist shearing stresses. In this example, the floor slab is also reinforced by upper and lower bars perpendicular to the reinforcement of the joist and by transverse rods laid over the upper and lower bars for the purpose of distributing the stresses over these in a uniform manner. It will be observed that vertical stirrups are employed in the floor slab, as well as in the beam part of the construction. The points at which the various bars and rods cross are securely connected by a binding of annealed wire, and the whole of the reinforcement is firmly held together by the surrounding concrete. In this way a complete network is formed capable of resisting stress in every direction.

In some parts of the building where the spans were small, the floor slabs were made with single reinforcement. Fig. 104 includes transverse and longitudinal sections of a floor beam with two sets of double reinforcement, and of portions of the adjoining floor slab with single reinforcement. The construction of the beam here represented requires no explanation, being essentially similar to that of the joist illustrated in the previous drawing. It will be seen that the single bar shown in the cross section is raised so as to pass over the upper reinforcement of the beam, instead of being carried straight through. This arrangement is very desirable in floor slabs where only one bar is employed, for the reason that, in construction of this kind, when the concrete is monolithic, continuous girder action is always evidenced to some extent, and by bending up the ends of bars terminating in beams, or by bending up bars running across beams as in the present case, the requisite resistance is offered to tensile stress developed in those parts of the upper area lying between the abutment and the points of contrary flexure. The bars in the floor slab running parallel to the main reinforcement of the beam are also bent up at any places where they may have to cross floor joists. Floors of this type are employed for spans not exceeding 12 ft. and for loads of not more than 56 lb. per sq. ft.

Fig. 105 represents the beam and floor

construction employed in parts of the building where the loads are more considerable. The sections here given show a beam with three sets of double reinforcement, and for the purpose of insuring even distribution of stress over these bars short transverse rods were fixed as indicated in the lower part of the cross section. The thickness of the floor slabs varies according to requirements from 5 centimetres to 20 centimetres.

All the roofing system of the building is in concrete-steel, designed in a manner practically the same as that followed in the case of the floor slabs. The flat top of the roof is supported in part by columns as shown in the section (Fig. 102), and to prevent the admission of moisture the whole of the roof was covered by a layer of waterproof material placed over the concrete.

In moulding the columns, beams, and floor slabs of this building, falseworks were employed generally similar to those previously illustrated. In the Coignet system, however, the beams are frequently moulded in advance in a shed upon the site of the works, or in the basement of the building in course of erection. Bolts are passed at intervals through the sides of the beam moulds, and are used for the attachment of longitudinal strips of timber one on each side, placed at a suitable height for supporting the temporary flooring upon which the reinforced panels are afterwards formed. The transverse reinforcement of the beams so moulded is allowed to project at each side so that it may afterwards be incorporated in the concrete of the floor slabs. After they have thoroughly hardened, the beams are hoisted into position, and, as they serve for the support of the falsework for the floor slabs, considerable expense and delay are obviated. It should be remarked, however, that when this method of construction is adopted, the resistance of the beams and floor slabs should be computed separately. The reason for this recommendation is to be found in the fact that it is difficult to insure a really satisfactory bond between old and new concrete, and, although both parts may be well tied together by the intersecting strands of the reinforcing network, it would be unwise to rely upon the establishment of continuous girder action throughout the construction.

One way of building hollow floors on the Coignet system is by moulding the beams and ceiling slabs together as beams and floor slabs are ordinarily made, the reinforcement of the ceiling plates running transversely to that of the beams. The tops of the beams are afterwards covered with a boarded flooring. This does not provide an airtight space between the ceiling and the floor covering, and from the



FIG. 101.

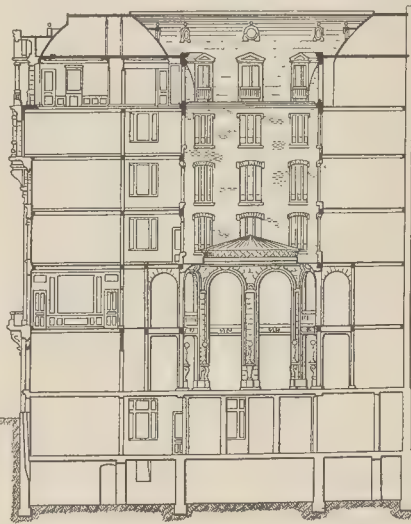


FIG. 102.

Illustrations to Student's Column.

* The Builder, vol. lxxxv, p. 528.

Co., Edinburgh, and Wilson & Son, Glasgow, tile floors, Allan & Sons, Edinburgh, tiles. Milton. Hillings, & Co., Glasgow-Trent, Ill. & R. Johnson, Col. Carter & Co., Poole; electrical contractors. Middleton & Townsend, Edinburgh and London, heating engineers, D. Lowe & Co., Edinburgh; glaziers, George Lindsay & Co., Edinburgh; painters, Don & Marshall, Dunfermline; bells and blinds, W. Brydon & Sons, Edinburgh; billiard tables, G. & T. Scott, Edinburgh; grates, Singer & Co., Frome, Wiltshire; bath fittings, etc., Shanks & Co., Somerset; gymnastic apparatus, Meins, Glasgowed; glazed bricks, J. & M. Craig, Lilliehill (see W. Christie).

CO-OPERATIVE BUILDINGS, WORKING SANDS.—The premises for the Working Sands Co-operative Society have just been opened. The premises occupy a position in the main street, the architect was Mr. W. B. Stonebridge, of Workington, and the builder, Mr. C. Sinfield, Aspley Gussae.

HYPODROME, IPSWICH.—The new Ipswich Hippodrome in St. Nicholas-street has just been opened. The building work was carried out by Mr. Frank Matcham, architect. The cost of the work is about 15,000l.

NEW BUILDINGS, NEW BROAD-STREET.—The property, comprising Nos. 54-62, New Broad-street, E.C., occupying practically the whole of the south side of that thoroughfare, which was recently offered for auction at the Mart, has since been let privately by the Corporation of the City of London, and it is, etc., the old buildings will be demolished forthwith and new office buildings and bank-mises erected from designs of Mr. Paul Hoff, architect.

STAINED GLASS AND DECORATION

MEMORIAL SCREEN, TORQUAY.—A rood screen is about to be erected in Llandudno parish church, Torquay, in memory of the late Mr. J. Snelgrove. It has been designed by Mr. C. Foster Hayward, architect, London. The work is being executed by Messrs. Harry Hems & Sons, Exeter.

APPOINTMENTS

LINCOLN'S INN.—Mr. H. William Simpson has been appointed Surveyor to the Honourable the Society of Lincoln's Inn, vice Mr. Dennett Esher Barry, who has resigned the appointment.

BRITISH MUSEUM.—At their meeting on March 27 the Electing Trustees elected Viscount Dillon, Past-President of the Society of Antiquaries, a Trustee of the British Museum.

LEADS.—The Waterworks Committee of the Leeds Corporation, on the 30th ult., selected an engineer, and accepted a tender for the construction of the Colsterdale reservoir. The Committee decided to recommend the Council to appoint Mr. Charles George Tennil, M.Inst.C.E., of Newcastle-on-Tyne, to the position of waterworks engineer of the city. For the appointment, which is a new one in Leeds, as an independent position, and the salary attached to which is 1,000l. a year, with office and staff, there were originally fifty-eight applicants. These were reduced to nine, and a few days afterwards the nine were reduced to the following:—E. F. McCullough, waterworks engineer, Belfast; C. J. Batley, waterworks engineer, Oldham; W. Ratcliffe Barnett, engineer in connexion with the Thirlmere water scheme, Manchester; Charles G. Hannell, resident engineer at the Catcote Reservoir, Newcastle. Mr. Tennil, who is 60 years of age, is at present engaged in directing under Messrs. T. & C. Hawksley, the construction of a reservoir for Newcastle and Gateshead at Catcote, near Otterburn, in Northumberland. At the same meeting the Committee agreed to recommend the Council to accept the tender of Messrs. R. McAlpine & Co., of Glasgow, for the Colsterdale reservoir, at an estimated cost of 297,000l.

SANITARY AND ENGINEERING NEWS.

DRAINAGE PLANS.—The Paddington Borough Council, on Tuesday, appointed Alderman H. H. Collins, Chairman of the Public Health Committee, and Mr. H. G. Handover, the Vice-chairman, to represent the Council on the deputation which the Royal Institute of British Architects is organising to wait upon the London County Council to ask that body to modify, in certain directions, the by-laws as to the deposition of plans with regard to drainage works, in view of the present unnecessary cost and trouble involved in complying with said by-laws. The Westminster City Council is to

be represented on the deputation by Alderman Emson and the City Engineer.

BRIDGE, EXETER.—The Mayor of Exeter opened, on the 28th ult., the new steel bridge which has been thrown across the Exe. The new structure provides an approach to the city at the western end, is 150 ft. span and is 50 ft. wide between the parapets. It has been built upon the three-hinged principle, and the rise is 13 ft. 6 in. The abutments are all faced with Devonshire granite from Dartmoor. The paving has been supplied by the Patent Victoria Stone Company, London. The engineers are Sir John Wolfe Barry and Mr. C. E. Brereton, with Mr. F. G. A. Pinckney as resident engineer. Messrs. Heenan & Froude, of Manchester, were the contractors for the steelwork, and Mr. Tom R. Suggett has acted as contractors' engineer.

DRAINAGE SCHEME, HOWDEN, YORKSHIRE.—On the 28th ult. an inquiry was held on behalf of the Local Government Board by Mr. E. A. Sandford Fawcett, M.Inst.C.E., relating to an application of the Howden Rural District Council for sanction to borrow 4,000l. for a sewage scheme for the parish. A sewage scheme was carried out about twenty years ago, but has been of little value. The Clerk of the Council (Mr. Henry Green) stated that recently, out of seven schemes which were submitted in competition, the Council selected that designed by Mr. Arthur Shaw, engineer, of Messrs. Shaw & Powsells, Nelson.

SEWERAGE WORKS, LYVEBURY, DEVON.—These works, which have just been opened, comprise about 1,100 yds. of new intercepting and outfall sewers, with the necessary manholes, etc., forming, together with the previously existing sewers, a complete system for the whole town, purification works for the sewage of 2,000 people, together with storm water up to a total of 120,000 gallons per day, and irrigation water for further 120,000 gallons per day of storm water. The new sewers, which are in the western part of the town, are laid with stoneware pipes, fitted with the double-seal joint recently introduced by Messrs. Freeman Hines. The works consist of two grit chambers, two septic tanks, and eight aerating bacterial filters, with smaller chambers. The tanks, which are covered with concrete arches and a layer of soil, are each 70 ft. long by 12 ft. wide, and 7 ft. in average depth below the springing of the roof arches. The filters, which are worked on the contact system, are each 28 ft. long by 22 ft. wide, broken to gauge and freed of dust, the particles of this material forming a resting-place for the nitrifying bacteria. They are arranged in two groups of four, the working of each group being controlled by the Septic Tank Company's automatic alternating gear. The work has been carried out by Mr. G. R. Andrews, of Ivybridge, assisted by his sons, and has been supervised by Mr. H. V. Smith, and subsequently by Mr. Anthony Etheridge, clerks of works. The amount of the contract was 2,850l. 16s. 1d., but, during the progress of the work, some additional sewers were ordered to take the place of old ones, which were found to be defective.

ACTON SEWAGE BILL, 1905.—At Tuesday's meeting of the London County Council, the Parliamentary Committee brought up the following report:—The Acton Sewage Bill, promoted by the Acton Urban District Council, seeks to authorise the District Council to construct and maintain sewerage and sewage outfall works, and to make further provision for the admission of sewage into the metropolitan main drainage system from a portion of the urban district of Acton. The preamble recites that, owing to the large increase in houses and population in Acton, the present sewerage works and outfall which the Acton Local Board (now the Urban District Council) were authorised to construct in 1881, for the purpose of taking the drainage of part of the district, have become inadequate; that it is expedient that the District Council should be authorised to construct a new sewer and outfall; that prior to 1855 the drainage of that part of the district, other than the part above mentioned, entered the Stamford Brook sewer, which, by Metropolitan Management Act, 1855, was vested in the Metropolitan Board of Works, and was by that Board connected with the metropolitan main drainage system; that provision was made by the London County Council (Acton) Sewage Act, 1898, for the payment of certain sums by the District Council to the London County Council in respect of the future use by the District Council of the metropolitan main drainage system; and that, owing to the before-mentioned rapid increase of population, the London County Council should be required and authorised to receive and dispose of sewage of the district which it is not now required and authorised to receive; but that the east and west branches of the Stamford Brook sewer should be relieved of flood water

from the district, which should be discharged into the Thames as proposed in the Bill. The Council at the present time deals with a certain portion of the sewage of Acton, and the matter is governed by the London County Council (Acton) Sewage Act, 1898. The features of this case are not such as would, in our opinion, form any sufficient reason for compelling the District Council to compel the Council to receive further sewage from Acton into the main drainage system of London. Consequently, we gave instructions for the most strenuous opposition to be offered to the proposal on the grounds that, if sanctioned by Parliament, it would be fraught with the greatest danger to London. The proceedings on the Bill were opened on Thursday, March 23, before a Select Committee of the House of Commons, presided over by Mr. Agg-Gardner. . . . After hearing counsel's speech, which was followed by cross-examination, the Committee then decided as follows:— "The Committee, in passing the preamble, state (i.) that, in view of the facts of this case, it is their opinion that this decision does not prejudice the general principle raised by the London County Council, namely, that the County Council should not be compelled to take, against their will, the sewage of outside bodies; (ii.) that a clause giving a right to compensation to inhabitants of Chiswick who might be injuriously affected through the burting of sewers from causes other than that of negligence shall be inserted." We regret that this decision should have been arrived at, and, in the circumstances, we have seen no alternative but to take all necessary steps to oppose the Bill in its subsequent stages.

FOREIGN.

FRANCE.—Parliament has adopted the scheme for a railway between Monmartre and the Gare Mont-Parnasse (Paris), to be carried by means of the tube system invented by M. Berliet. A committee, under the Presidency of MM. Rodin and Carolus-Duran, has been formed to erect a monument in memory of the eminent sculptor Carpeaux. The execution of the monument is to be entrusted to M. Fugel, who is a pupil of Carpeaux. A committee has also been formed for the erection of a monument to Vollon, the eminent Still-Life artist. A monument to de Musset is to be erected at Neuilly-sur-Seine, the statue for which has been executed by M. Granet. Parliament has voted in favour of the establishment of a direct line of railway to Biarritz, and the suppression of the present terminus "de la Negresse." The municipal theatre at Saint-Dizier is to be rebuilt from the designs of M. Ferrant, of Paris. A new hospital is to be built at Ancenis (Loire Inférieure) at an estimated cost of 378,000 francs. The seventy-second Congress of the "Société Française d'Archéologie" will be held at Beauvais from the 20th to the 28th of June. M. Leray, architect, of Nantes, has been commissioned to rebuild the Hôtel de Ville of Redon, at a cost of 140,000 francs. The Municipality of Cahors intend to replace the old bridge by a new steel one in the same position. The Chamber of Commerce of Nancy have instructed their architects, MM. Toussein & Marchal, to carry out a building which is to accommodate the whole of the services of the Chamber of Commerce and the Bourse. A monument in memory of M. Ernest Coquart, the architect, who died in 1902, has been erected at the Ecole des Beaux-Arts. It is the joint design of M. Bernier (architect) and M. Marquette (sculptor). The death is announced, at age of 72, of M. Gustave Blot, who won the Grand Prix de Rome in 1855, and who, since 1890, was director of the atelier of engraving in the Institute of Fine-Arts at Antwerp.

GERMANY.—The "Wartenburg" House, in Charlottenburg, built in 1823 by Schinkel, is to be pulled down. The exhibition buildings at Lüttich have been built from plans by Herr Jaffé, of Berlin, and the decorative work was executed by the sculptor, Herr Robert Schirmer. The old "Kurland" Palace, at Dresden, is to be utilised as an Art Gallery by the Dresden Society of Artists. The restoration of the old frescoes in the Town Hall at Nuremberg has been entrusted to Professor R. von Seitz.

SWITZERLAND.—The new schools at St. Gallen are to be built from plans by MM. Curjel & Moser, of Karlsruhe, to whom was awarded the second premium in the competition for designs; the building will cost about 920,000 francs. The plans by Herr Truninger have been chosen for the school at Mogselsberg, which is to be erected at a cost of 51,500 francs.

The new bank at Basle is to be built from plans by the architects, H. Weideli & R. Bischoff, of Karlsruhe.

AUSTRIA.—The memorial to the Grand Duke Karl Ludwig, which is to be erected in

Vienna, will soon be completed; the work, which is being executed by the sculptor, Herr E. Hofmann v. Aspernburg, symbolises Science and Art, and Peace and Unity. An obelisk, standing on a marble pedestal, is surmounted by an eagle with outstretched wings; on the front of the obelisk appears a medallion portrait in relief of the Grand Duke, and on the other side is a tablet bearing an inscription; on either side of the pedestal is a female figure, Science (standing), and Art (kneeling), who are offering homage to the Grand Duke.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—The partnership heretofore subsisting between Messrs. Essex, Nicol, & Goodman, architects (Birmingham), has been dissolved by mutual consent. In future Mr. Oliver Essex, F.R.I.B.A., and Mr. John Goodman will practise as Messrs. Essex & Goodman, at 21, Waterloo-street, Birmingham, and Mr. J. Coulson Nicol, A.R.I.B.A., will practise with his son, Mr. G. Salway Nicol, A.R.I.B.A., as Messrs. Nicol & Nicol, at King's Court, 117, Colmore-row, Birmingham. Both firms will have a London office at 25, Bedford-row, W.C. All moneys due to or from the original firm will be received or paid at Colmore House, 21, Waterloo-street, Birmingham, or at King's Court, 117, Colmore-row, Birmingham.

ROYAL ORTHOPÆDIC HOSPITAL.—Consequently upon the amalgamation with the National Orthopædic Hospital, in Great Portland-street, W., the site of the buildings in Oxford-street and of No. 15, Hanover-square has been cleared for the erection of a block of offices and residential flats designed by Mr. Paul Hofmann. A charter is being prepared for the combination of the two institutions under the style of the Royal National Orthopædic Hospital, and a site adjoining the present premises in Great Portland-street has been obtained for the erection of additional wards and accommodation for the staff. A feature of the administration is the instruction of the crippled children in various useful handicrafts in so far as their capabilities will permit, and the school has lately passed to the Education Committee of the London County Council, who employ a teacher in one of the wards.

RULES AFFECTING ARTISTS AND STUDENTS IN ITALY.—Mr. Neville Rolfe, British Consul-General in Southern Italy, sends a word of warning through the Foreign Office to the effect that the new regulations for the admission of artists and students gratis to the Italian galleries and excavations are very much more stringent than those hitherto in force. The artists and students should now submit their credentials to the Italian Ambassador in London, and on his certificate a pass will be granted. Until lately the certificate of the artist's Consul was accepted. Now, unless the artist has provided himself with a certificate from the Italian Ambassador in his native country he must make his application to the Ambassador accredited to the Court at Rome, who must first judge whether the applicant belongs to a "recognised academy," and if, in his judgment, he does so, forward his application to the Minister of Education, who eventually sends a pass to the Embassy, whence it is usually forwarded to the Consulate of the city from which the application is made, and then by the Consul transmitted to the applicant. The pass, when obtained, permits the bearer to measure, sketch, and photograph, and to go in and out of the gallery or excavation free as often as he pleases. If he wishes to copy a picture he must apply to the Director of the gallery in which it is exhibited, who will inform him under what conditions he may work. Amateurs can obtain permission to photograph on application to the Director of the gallery or excavation in question. The application must be on stamped paper of 60c., which can be procured of any tobacconist in Italy. Mr. Rolfe adds that nothing of further importance has been found at Pompeii during the past year. The excavations are progressing regularly, but not with any startling rapidity, nor is it desirable that great tests should be used, the objects still buried being perfectly safe where they are, and destined to give pleasure and instruction to succeeding generations.

BRINDLEY'S HOUSE AT TUNSTALL.—Adverting to our recent review, p. 149 *ante*, of a volume of the re-issue of Samuel Smiles's "Lives of the Engineers" which contains the memoir of Brindley, we may mention that the Guardians of Wolstanton and Burslem Union have recently rented Turnhurst Hall at Tunstall, for the reception of the aged poor, in supplement of the workhouse at Chell, which does not provide the accommodation required. Turnhurst Hall was at one time the home of Brindley, and in the garden

is a model of part of the works of the Bridgewater Canal, with the construction of which his fame is so closely associated.

NO. 1, CORNHILL.—A few days ago the Liverpool and London and Globe Insurance Company moved into their new offices, erected on the former site, at the corner of Lombard-street and Cornhill, after plans and designs by Mr. J. MacVicar Anderson, the contractors being Messrs. Colls & Sons. The former premises were built at the time of the laying out, by William Mountague, the City Architect, of King William-street, in 1824-30, when were pulled down Nos. 1-10, Lombard-street, south side, together with Dove-court and Little Lombard-street, and some of the opposite houses in Lombard-street, and at the angle with Cornhill. Thus, the roadway immediately in front of the new premises marks the site of the original No. 1 Cornhill, occupied by Thomas Guy, publisher and bookseller, the benefactor of St. Thomas's and Guy's hospitals, and afterwards by Pidding's lottery office, at what was known as the "Lucky Corner."

METROPOLITAN WATER BOARD.—At their meeting on March 31 the Board agreed to introduce a Bill in the course of next Session of Parliament providing for uniform scales of charges applicable throughout the limits of supply. For purposes of engineering administration, the Board have divided that area into five districts:—(1) The New River District, to consist of the present area so-named, and to include Tottenham and Enfield; (2) The Eastern District, to consist of the present East London District; (3) The Southern District, to consist of the present Southwark and Vauxhall and Lambeth districts; (4) The Western District, to consist of the present Chelsea, Grand Junction, and West Middlesex districts; and (5) The Kent District, as now; subject to a revision of the boundaries in each instance if found advisable. They also appointed Mr. E. Collins, the Distributing Engineer of the New River Company, to be Engineer of that District, at a salary of 1,500*l.*-1,750*l.*; Mr. H. F. Rutter, Engineer of the West Middlesex District, to be Western District Engineer, at a salary of 1,200*l.*-1,500*l.*; and Mr. W. Blackburn, Deputy-Engineer of the East London District, to be Eastern District Engineer, at a commanding salary of 800*l.*

THE LABOUR MARKET IN THE COLONIES.—The April Circulars of the Emigrants' Information Office state that there is a good demand for farm labourers in Canada. The demand for mechanics is not so great; but at this season of the year skilled men in the building and metal trades should have little difficulty in procuring good employment. In *New South Wales* there is little or no demand for more mechanics, miners, farm labourers, or station hands. In *Victoria* there is no demand for more labour at Melbourne, and very little in country districts, except for farm labourers. In *South Australia*, at Adelaide, the labour market is overcrowded, and, speaking generally, no working man is advised to go to South Australia unless he is a specially skilled man in his trade, or has friends to go to, or has sufficient money to live on at first. There is no demand for miners. A report from Brisbane, in *Queensland*, states that there is no demand for workers of any description at present, although good openings exist for experienced farmers to take up sections on favourable terms. In *Western Australia* there is little demand for more mechanics or labourers from this country unless they can keep themselves for a while. In *Tasmania* miners and mechanics at Zeehan, Queenstown, and Gormanston, on the west coast, and in the surrounding districts, are fairly well employed; but the local supply is, as a rule, sufficient. In other parts of the State there is no general demand for more mechanics, but there is an opening for them if they have sufficient money to keep themselves at first. The supply of farm labourers is not quite sufficient, and skilled men can get work. Reduced passages to *New Zealand* are given to emigrants with little capital. Work has been generally speaking plentiful during the last few weeks, as is usual in the summer season. Men in the building, and, to a less extent, the engineering trades, coach-builders, saddlers, plumbers, blacksmiths, saw millers, flax millers, wheelwrights, and others have been well employed, except at Christchurch and one or two places. No one is allowed to land in *Cape Colony* unless he has secured employment or possesses 20*l.* on arrival. Considerable numbers of persons are out of work at Cape Town, Kimberley, Port Elizabeth, and elsewhere, so that emigrants are warned against going to Cape Colony at the present time. In *Natal* labour is plentiful both in Durban and one or two inland towns. Carpenters and bricklayers, and especially unskilled workmen and indifferent mechanics, are out of employment. No one, therefore, should go out in search of work unless he obtains a nominated passage through friends in the

colony. No one may enter the *Transvaal* without a permit, which should be applied for at least a week before sailing. Through the output of gold is very large, and more white men are being employed than in the mines than in the last year, and a large number of black labour at Johannesburg is still considerably in excess of the demand. No one may enter the *Orange River Colony* without a permit. There is no improvement in the demand for labour, and persons are warned against going to the Colony at the present time in search of work.

GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE.—At this college (204, George-street, Glasgow), on Wednesday, the 29th ult., the students and staff of the Architectural Department met to express their feelings of goodwill towards Professor Goulley, B.Sc., A.R.I.B.A., on the occasion of his approaching marriage. Mr. Vernon Constable occupied the chair, and was supported by Mr. John B. K. McTaggart, who presented the Professor with a handsome combined bookcase and curio cabinet, bearing a personal inscription.

IMPROVEMENTS.—Bridges, streets, and street improvement is now being carried out in Huddersfield-road, Brighouse. For some years the inadequacy of the bridge spanning the Calder at this point has been felt, and contracts, amounting to about 3,000*l.*, have just been accepted for the widening of the bridge and the improvement of the approach and roadway. Mr. S. S. Heywood, the Borough Engineer, has prepared the plans and is supervising the work.

A LARGE PIECE OF STONE QUARRYING.—An interesting piece of work was carried out in the island of Portland on the 25th ult. in the King-arron quarries of the Bath Stone firm. From these quarries the stone has been excavated for the erection of the new Government buildings at Whitehall and the new War Office. What is known locally as a "big ream" was most successfully carried out. This phrase expresses the cleavage method adopted by the quarries in splitting the rock and wrenching it from its natural bed and making it into the process adopted was as follows:—About forty "pits" were scored in the top of the rock, ranging from 18 in. to 24 in. in length, and into each of these were inserted two "pigs" of iron. Throughout the whole length of the "ream" about 170 large iron wedges were firmly driven between the "pigs" of iron. As soon as all was in readiness, forty-two men, using sledges from 12 lb. to 14 lb. each in weight, commenced the "battering assault." Striking simultaneously, one man to four wedges, they soon had the satisfaction of seeing the first sign of success in the shape of the heavy block along the surface. Continuing their vigorous work with occasional pauses to reset wedges, etc., they eventually severed the huge rock from its hold after a task of four and a half hours. The measurement of the piece was 40 ft. long by 20 ft. wide by 12 ft. deep, and it is computed to contain 1,500 tons, which is believed to be the largest "ream off" in the history of quarrying operations in the island of Portland.

JUNIOR ARMY AND NAVY CLUB. ST. JAMES'S.—The premises recently vacated by the Junior Army and Navy Club at the corner, south of St. James's and King streets, were taken on at 29,000*l.* from sale at auction on March 1st. The property is held on a lease from the Crown for a term of fifty-two years, and is superficially 40 ft. wide by 153 ft. long. St. James's-street and 153 ft. to King-street. The house was built for John Crookland, who kept the noted gaming-house, after Sir James Peimethorne's plans and designs, in 1832, as the 40 ft. James's Bazaar, with a saloon 100 ft. by 40 ft. Wyatt Papworth adapted the premises for the Junior Army and Navy Club in 1882-3, when he remodelled the front with bay-windows in the lower story, and added a curb road to the return front in King-street.

CAPITAL AND LABOUR.

BUILDING TRADES.—Over 200 bricklayers, plasterers, and masons have been thrown out of work at South Shields through a dispute. Months ago the employers proposed to the men that they should submit to a reduction of wages of 1*d.* per hour, that, in winter time, they should not start before breakfast time, and that the men refused to accept, and, in consequence, the masters gave them three months' notice to terminate their employment. No arrangement was arrived at, and the notice was extended by a month, and the men continued working under the old rules and conditions, while, with the view of coming to a settlement,

the men declined to accept the extension of time, and are now, therefore, out of work. The reason for the action of the masters is the depressed state of the building trade. Should the dispute continue, the number of men out of work will, in a short time, be increased, as other branches of the trade will be affected. The employers are advertising for men to take the places of those who have left their employment.

EDINBURGH JOINERS AND THEIR WAGES.—At a meeting of the Edinburgh, Leith, and District Building Employers' and Allied Trades' Association, held in the Building Trades' Exchange, 25, George-street, Edinburgh, on the 4th inst., a letter was read from the secretary of the Operative Joiners' Societies, in which it was stated that, at a meeting of both of the operative joiners' societies, held on March 20, the two proposals by the Masters' Association as to a reduction in wages and a change in the time of the working agreement were unanimously rejected, and that their Societies were to abide by the present code of working rules and regulations. It was unanimously agreed at the meeting on the 4th inst. to adopt the recommendation of the delegates who met with the operatives at the conference of March 24, and that notice be sent to the operatives that the by-laws would only be signed for another year on condition that the time of the agreement be changed from April 15 to July 1, and also that there should be a reduction of 1d. per hour (to be 9d.), the reduction of wages to take effect from and after July 1.

Legal.

ACTION BY ARCHITECTS FOR FEES.

The case of Runtz & Ford v. Baker came before Mr. Justice Wills and a special jury in the King's Bench Division on the 29th and 30th inst.—an action by the plaintiffs to recover from the defendant the sum they alleged to be due for the preparation of certain plans. Defendant, by his defence, said that the contract had not been fulfilled, and he counter-claimed for damages for alleged delay.

Mr. Danckwerts, K.C., and Mr. Ernest Pollock appeared for the plaintiffs, and Mr. H. F. Dickens, K.C., and Mr. F. Watt for the defendant.

Mr. Danckwerts, in opening the case, said the plaintiffs were Messrs. E. Runtz & Ford, practising at Walbrook, E.C., who, amongst other works executed by them, had designed the new Gaiety Theatre in the Strand. Defendant and his wife were the owners of a building estate at East Finchley, the Church Fields Estate. Mr. Runtz, the senior member of the firm, was, in his younger days, a member of an athletic club to which the defendant also belonged, and in that way they knew each other. Defendant, who had this estate, employed the plaintiffs to lay it out for the purposes of building, and this work was completed about April, 1902. About the middle of that month the defendant and Mr. Runtz met, and matters were settled up in connexion with that job. Upon that occasion the matter was mooted of building certain houses upon certain portions of the estate. The question of what buildings should be erected interested both parties throughout. Both had a taste of suburban buildings and improvements that might be made, and the idea was that some buildings should be erected of a superior or better character than the usual run of suburban dwellings. Accordingly, there was, about April 22, a meeting, and it was agreed that the piece of land in question should be dealt with first. It was found that five pairs of semi-detached houses could be erected on the site. Defendant had an idea to build a style of house that he had seen at Muswell-hill. After discussion between Mr. Runtz and the defendant, it was agreed that the plaintiffs would not charge him for their work, but would do the whole thing for an inclusive fee of 275*l.*, and for this they were to prepare plans and plot out the ground and superintend the work until completion. Messrs. J. S. Lee & Sons were engaged by the plaintiffs as the quantity surveyors. Defendant desired that the houses should cost about 1,000*l.* a pair. Eventually tenders were asked, and then it was found that the lowest tender was for 2,250*l.* a pair. Therefore that fell to the ground. His instructions were that all along the defendant had been in consultation with a Mr. Collins. Defendant then instructed the plaintiffs to draw the plans in order that the cost of the houses might be considerably reduced. Plaintiffs pointed out all along that the houses the defendant desired could not be erected for 1,000*l.* a pair. In January, 1903, Mr. Collins was sent by the defendant to confer with Mr. Pridmore, of Messrs. Lea & Sons, and the result was that the plans ultimately carried out were the plans altered at this conference.

Eventually defendant returned the plaintiffs' plans, but he had copies, said the learned counsel, and Collins agreed to build for 1,650*l.* a pair. The plans and specifications worked to would be found practically to be the plans and specifications of the plaintiffs. As a matter of fact, the plaintiffs found that the plans the houses were erected from were their plans "buildings," if he might use the word. In May, 1902, a Mr. Farrow reported upon the houses that the defendant had erected to the effect that they substantially corresponded with the plaintiffs' plans. Plaintiffs wrote offering to accept 150*l.* for the work they had done, but the defendant replied repudiating any claim upon him. The present proceedings ultimately followed.

Mr. Ernest Runtz, the senior member of the plaintiff firm, gave evidence as to having known the defendant about twenty-seven years. He said that all along he told the defendant that the houses he desired could not be built for 1,000*l.* a pair. Defendant told him to get as near to it as he could. Witness prepared a number of sketches which he submitted to the defendant. Plaintiffs were liable to the quantity surveyors for their fees, some 50*l.* He told the defendant that the houses would probably cost more than 1,500*l.* a pair. From start to finish they had never had a penny from the defendant. Mr. Baker was always, from the commencement, altering his mind. There was a meeting on December 30, between himself, Mr. Baker, Mr. Collins, the builder, and Mr. Pridmore, and he then received defendant's instructions to reduce the frontages of the houses so as to reduce the cost, and so get nine houses instead of eight. That was done, and the plans were in Court. Mr. Ford was the actual draughtsman in the matter. He had seen the houses which were built and the plan deposited with the Local Board. The plan was similar to his, and the elevation was similar. In his opinion, his elevation and drawings must have been used for the purpose of erecting the houses in question. That was self-evident even to a layman. His designs and quantities were for a good class of house of about 65*l.* a year rental. The present houses were not so well built as his would have been, and they were a little smaller than his would have been.

Cross-examined by Mr. Dickens, At the time in question he had not done much small suburban work. His plans and elevation were not taken from a plan which Mr. Collins lent him. He could not remember the plan produced. There was no resemblance in the elevation in the plan produced to his elevation. He did not take any sketch of the elevation of the houses at Muswell-hill. It was not likely that he would take a speculative builder's plans to base his own plans on. He did not think that houses which would cost 2,250*l.* a pair would be any good from an investment point of view in that neighbourhood.

Do you suggest that you ever put before the defendant, as a substantive proposition, that you could build these houses for 1,600*l.* a pair under your agreement?—I could not do that. It depended upon what Mr. Baker wanted.

I suggest to you that your plan was taken from Mr. Collins' plan, and that you used a design which was common to both of us?

The witness emphatically denied that his plan was taken from Mr. Collins' plan. He said that the principle of the plan was the same, but the elevation was entirely different.

Examination continued.

At the first interview, before the letter of April 24 was written, defendant did not point out to him that it was essential that he made the plans so that defendant got a pair of houses for 1,000*l.* Defendant did ask him to get them as cheap as possible. Defendant wanted a certain class of house built, and suggested 1,000*l.* a pair. Witness told him from the start when he saw the Muswell-hill houses, that that could not be done, and then the defendant said, "go on with your work, and if it comes out at too much we shall have to boil it down."

Did not Mr. Baker tell you in June that they were not to exceed 1,200*l.* a pair?—I have no recollection of it; but he might have done so.

Did he not make it a condition that, in any event, they were not to exceed 1,200*l.*?—No; I should not have agreed to it.

What amount did you think building to your plans would be at?—I imagined that they would come out at about 1,600*l.* or 1,700*l.* a pair originally, and then I thought we might have to carve it down a bit. It was the question of material which affected the cost. The plans need not have been revised in order to build cheaper.

Mr. C. M. Ford gave evidence as to drawing the plans in question. He said he had never entered into any fixed figure for the cost of

the houses with the defendant. Defendant seemed to think that, if he could get the houses put up for about 1,500*l.* a pair, he could manage it from an investment point of view. He had seen the houses which had been erected, and could see that their elevation had been followed. He was the author of the elevation, but he did not claim the plan.

Cross-examined.

Defendant had never told him that he wished the price limited to 1,000*l.* When he was drawing the plans he had a general idea that the houses could be put up for anything between 1,400*l.* and 1,600*l.*

Mr. H. T. B. Spencer, A.R.I.B.A., and manager to the plaintiffs, examined, said he called on Mr. Baker on January 28, 1903, and took with him a list of suggestions made by Mr. Collins and Mr. Pridmore. He told defendant that certain of the suggestions did not commend themselves to the plaintiffs. He said that some of the suggestions were what a speculative builder would make use of, but were such that an architect could not pass. He told the defendant that the object of the discussion was to reduce the price of the buildings. On May 9, 1903, he went to the offices of the Local Board, and saw the deposited plans there. The plans seemed almost identical with the plans that the plaintiffs had prepared, but the fireplace in the hall was omitted. That was the chief difference. He noticed, too, a great resemblance to the plaintiffs' elevation. All the suggestions that the plaintiffs had made seemed to have been carried out. The houses that the defendant had built were according to the plaintiffs' plans with the modified suggestions.

Cross-examined.

He took no part in the preparation of the plans.

Mr. Arthur Pridmore, a quantity surveyor, and partner in the firm of Messrs. J. S. Lee & Sons, quantity surveyors, of 35, Craven-street, Strand, examined, said he had seen the defendant's houses, and had compared them with the plaintiffs' plans and specifications made on January 12, and he came to the conclusion that the buildings, as built, were plaintiffs' drawings, carried out with a list of modifications applied. The houses were the plaintiffs' design applied in the cheapest possible way.

Mr. F. R. Farrow, F.R.I.B.A., of the firm of Messrs. Coulson, Farrow, & Nesbitt, 29, New Bridge-street, E.C., said that last year he had inspected the houses built by Mr. Collins for defendant, and found that they corresponded with the plaintiffs' plans. The size of the rooms had been reduced, and the arrangement of the hall slightly varied. The elevations were the same as plaintiffs, with slight modifications.

This being the plaintiffs' case,

Mr. Dickens, in opening the defendant's case, said that his client had always been anxious that this matter should go through with the plaintiffs, but he had had to employ Mr. Hunter, another architect. The defendant sought the advice of the plaintiffs in this matter, and the basis of the transaction between the parties was contained in a letter from the defendant to the plaintiffs, which stated that he desired to erect the houses at a cost of 1,000*l.* a pair. The plaintiffs had got out plans which were impossible to work to for that amount. Certain alterations were made in the plans, but the delay was great, extending over some months. Even after great delay, it was found that the plans were of no use to the defendant, and, after the lapse of ten months, he put an end to his dealings with the plaintiffs, and had to take steps to get other plans and build his houses. Mr. Collins and Mr. Hunter would give evidence that they had no plans of the plaintiffs or worked in any way to them. The similarity arose through the defendant desiring his houses erected after the style of those at Muswell-hill, which Mr. Hunter saw. Referring to the counter-claim the learned counsel said that the defendant had lost money owing to the delay.

Mr. Sydney Herbert Baker, the defendant, a surveyor and brewery agent and valuer, of No. 62, Coleman-street, E.C., gave evidence generally corroborating the statement of counsel. He said that at the outset he told Mr. Runtz that he did not wish the houses to cost more than 1,000*l.* a pair, but, subsequently, agreed to go to 1,200*l.* No other sum was mentioned in his hearing than the outside price of 600*l.* a house. He afterwards employed Mr. Hunter as his architect, and he returned the plaintiffs their plans in February, 1903.

Cross-examined by Mr. Danckwerts, 1,600*l.* was never named to him as the minimum cost. He never said that he did not wish the price to exceed 1,600*l.* a pair. He did not give Mr. Collins the plaintiffs' plans.

Mr. Arthur Collins, examined, said he was

a builder, and that he built the houses in question from their own plans. He prepared the plan produced. There might have been certain things suggested to him by Mr. Runtz.

Cross-examined by Mr. Danckwerts. In June, 1902, he lent the plan to Mr. Runtz. His plan was not practically a reproduction of Mr. Runtz's plan.

Mr. Chas. Hunter, A.R.I.B.A., examined, said he had had thirty-five years' experience as an architect, and, early in 1905, he received instructions from Mr. Baker to prepare plans for the erection of the houses in question. He received a plan from Mr. Collins and prepared a plan of his own on those lines. The houses were built from that plan. He saw Mr. Runtz's plan for the first time at counsel's chambers about a week before. He saw nothing remarkable about the plaintiffs' elevation.

Mr. A. E. Pridmore, an architect and surveyor, examined, said he had seen the plans in question. He saw nothing remarkably original in plaintiffs' plans. The design was quite an ordinary one for a suburban villa. There was no artistic merit about it.

This being the defendant's case, learned counsel addressed the jury on behalf of their respective clients.

At the conclusion of his lordship's summing-up, the jury returned a verdict for the plaintiffs for 140l., this sum to include the quantity surveyor's fees, and judgment was entered accordingly for the plaintiffs, with costs. The defendants counter-claim was struck out, without costs.

HEAVY DAMAGES AGAINST CONTRACTORS.

In the King's Bench Division, on the 3rd inst., the hearing was concluded, after an eight-days' trial, of the case of the Mayor, Aldermen, and Burgesses of the Borough of Plymouth v. Pethick Brothers—an action by the plaintiffs against the defendants to recover upwards of 25,000l. damages for alleged fraudulent misrepresentation and breach of contract in the carrying out of drainage work for the plaintiffs. The defence was a denial of the alleged fraudulent misrepresentation and breach of contract, and defendants counter-claimed for 1,988l. 7s. 8d., the balance they alleged to be due to them from the plaintiffs under the contract.

Mr. Fletcher Moulton, K.C., Mr. J. F. P. Rawlinson, K.C., Mr. A. A. Hudson, and Mr. Fletcher Moulton, Jun., appeared for the plaintiffs, and Sir Edward Clarke, K.C., Mr. Foote, K.C., Mr. Ashton Cross, and Mr. Holman Gregory for the defendants.

Mr. Moulton, in opening the plaintiffs' case, said that the defendants, in April, 1900, entered into a contract with the plaintiffs to construct an outfall sewer. The plan was to take the sewerage from the treating tanks by an underground sewer in tunnel to the edge of low-water mark, and then to discharge it by means of two pipes buried in the bed of Plymouth Sound to something like a depth of 70 ft. or 80 ft. at extreme low water. The plaintiff Corporation gave the Admiralty an undertaking that the pipes were to be laid under the sea in a trench covered with concrete, and that the pipes were to be below the bed of the sea. The work was to be done by skilled divers under the direction of Mr. James Mansagh, a skilled engineer. The contract price was 21,000l., and the work had to be completed by December 9, 1901. There was a provision in the contract that if the work was unsatisfactory the plaintiffs were empowered to take the work out of the contractors' hands, and the work had to be carried out according to the specification, and the engineer's certificate was to be binding on the contractors. On August 8, 1902, defendants gave notice that they had completed the contract. Mr. Mansagh, on behalf of the plaintiffs, employed a man to dive to examine the work done, and that person took his information from people employed by the defendants. When the work had been completed plaintiffs' suspicions were aroused that the work was not right, and afterwards it was found that false representations had been made. A claim was put forward for exceptionally deep work much larger than the total amount of the contract. Final certificates were given in the belief that the representations were true. In January, 1903, the engineer, becoming suspicious, employed divers, who made a survey under water, when it was found that defendants had made an excavation in the bed of the sea not sufficient to cover either of the pipes, and one of the pipes was, in some places, entirely above the existing level, and they covered it with a kind of mound of concrete, doing that which the plaintiffs had been paying so much to avoid. The defendants, however, not being satisfied, had a survey made, and their divers' account was that the pipes were

properly sunk in trench. Subsequently, a joint survey was made by Messrs. Coode, Son, & Matthews, by which both parties agreed to be bound. That firm's report substantially supported the accuracy of the report on surveys made by the plaintiffs. The plaintiffs then had to put the work into other hands so as to have it constructed in a proper manner. The engineer afterwards cancelled the certificates, and the only question to be determined was the amount the defendants had been overpaid. There was another head of complaint, namely, that the work was scamped, and that the joints had not been properly made.

Evidence having been given that the work was not carried out according to the terms of the contract,

Sir Edward Clarke, in opening the defendants' case, said that when his clients found that they had been mistaken as to the work done they offered to guarantee the work for ten years, or leave the question to arbitration. The answer was a writ, and, as the plaintiffs charged them with fraud, they determined to fight the question until they had retrieved their character from that aspersion.

Mr. Benjamin Pethick gave evidence to the effect that in April, 1902, he never told that the pipes were not laid in trench, and he accepted the statements sent him. A man, named Pennington, was sent down to control the work for the plaintiffs, and he had the pipes taken out and relaid, as he was not satisfied with their position.

Cross-examined. Messrs. Coode, Son, & Matthews' report first told him that the pipes were not in trench. His men had deceived him.

Other evidence having been given, Sir Edward Clarke stated that a settlement had been arrived at. He said that the matter which compelled the defendants to fight the case was the charge of fraud involving the late Mr. Pethick. As long as that charge was persisted in the defendants had determined to fight the case out. As Mr. Moulton would make a statement exonerating the defendants from the charge of fraud, and would agree to a verdict being given for the defendant on that issue, defendants' charge of fraud, on the other part of the case which referred to the inadequacy of the work done by them, to pay the plaintiffs the sum of 20,000l., which had been fixed by Mr. Mansagh as the amount required to put the work right.

Mr. Moulton, on behalf of the plaintiffs, said he was glad to accept the assurance of Sir Edward Clarke that the principals in this case were free from the gross fraud that had been committed. The plaintiffs, on his advice, would accept a verdict for 20,000l., and costs, and with regard to the charge of fraud, there would be a verdict on that issue for the defendants.

Judgment accordingly for the plaintiffs for 20,000l., and the general costs of the action.

LONDON COUNTY COUNCIL v. JACKSON.

This case, in which the Council claimed Clapton Terrace-mews as a public highway, came again before the magistrate on Friday last week. Mr. Daldy, instructed by the solicitor to the London County Council, appeared for the Council, and Mr. Bodkin, instructed by Messrs. Beckingsale, Greenwood, Tucker, & Cross, solicitors, appeared for Mr. Jackson.

Mr. Scorgie, the Borough Engineer, and others were now called as witnesses on behalf of the Council, and Mr. Bros, the Registrar of the Southwark County Court, with Mr. Josiah Goodman, and a number of other witnesses, gave evidence on behalf of Mr. Jackson, who contended that the mews was private property and not a public highway, and, in the course of the proceedings, it transpired that Mr. Josiah Goodman and other witnesses had, on occasions, turned people back when seeking to use the mews. Mr. Fordham, the magistrate, dismissed the summons with ten guineas costs, and stated that he had himself visited the mews, and, having carefully considered the evidence, which had been very fairly given by the witnesses on both sides, was of the opinion that the mews was private property belonging to the owners of the houses in Clapton-terrace, now Clapton-common, and that there had not been sufficient use of the mews by the public so as to take away the rights of the owners in question.

Mr. Daldy, for the Council, asked for a case to be stated for the opinion of a higher Court, but the magistrate declined to do this.—*North London Guardian*.

CITY BUILDING DISPUTE.

The case of the North Borneo State Cigar Syndicate, Ltd. v. the City Offices Company, Ltd., came before Mr. Justice Lawrence and a special jury in the King's Bench Division on the 4th inst.—an action by the plaintiffs against the defendants for damages for loss

sustained by reason of the alleged wrongful acts of the defendants by which the customers coming to the plaintiffs' shop were hindered by the defendants' building operations. Defendants pleaded a denial of liability.

Mr. H. F. Dickens, K.C., appeared for the plaintiffs, and Mr. J. Eldon Bankes, K.C., and Mr. Oddy for the defendants.

Mr. Dickens, in opening the case, said that the plaintiffs carried on business at No. 66, Leadenhall-street, E.C., and the defendants were rebuilding the premises next door to the plaintiffs' shop. The plaintiffs alleged that the rebuilding was done in such a manner as to greatly inconvenience their business. A large hoarding had been erected close to the plaintiffs' shop, and the party wall had been altered up by means of a large beam just inside, and another large beam just outside the plaintiffs' door. The result of these projections was that the takings, which depended considerably of the traffic passing, had fallen off greatly. In March, 1905, the operations commenced, when the premises were pulled down. In September, 1905, the rebuilding commenced. A hoarding 60 ft. long, 12 ft. high, and resting on the pavement, some 34 ft. was erected, and this had caused a great inconvenience to the plaintiffs' business. Whilst admitting the defendants' right to rebuild their premises, the learned counsel referred to the 90th section of the London Building Act, which laid it down that the rebuilding must be done in such a manner and at such a time as not to cause so much annoyance to the adjoining owner or occupier. His case was that the work had been done in a manner contrary to the section.

After evidence had been given in support of the plaintiffs' case, his lordship, addressing Mr. Dickens, said he had to show that the defendants acted unreasonably, and, failing that, the plaintiffs had no cause of action against the defendants.

Mr. Dickens submitted that all he had to show was that the defendants had committed a nuisance.

His Lordship: They have a right under the London Building Act to build the house, but that the plaintiffs had no cause of action against the defendants.

Mr. Bankes submitted that there was no cause of action.

His lordship held there was no cause of action, and the jury, and entered judgment for the defendants, with costs. He also ordered the costs paid to the Court by the defendants to be paid out to them.

PATENTS OF THE WEEK

APPLICATIONS PUBLISHED.*

5,311 of 1904.—G. S. MAYHEW: *Machinet for Assembling the Slices Cut from a Disk or Plank into Compound or Composition Board.*

An assembling machine for joining slices cut from a deal, comprising a magazine for receiving said slices, and a double reciprocating clutch frame or pusher for feeding said slices from the magazine between guides and forward through the machine, a wiper adapted to slide respectively the edges of each slice of wood, it is passed from the magazine, a fan of adapted blades just outward over the joints formed between said slices, and a series of brushes surrounded by heated air adapted to clean the compo boards formed from said slices of superfluous glue after having been glued.

8,379 of 1904.—G. C. BROWN: *Sliding Frames of those Windows which are Adapted to Open or Turn Inwards.*

This invention relates to the sliding sashes of windows which are adapted to open or turn inwards, and has reference to the upper sashes of such windows. Heretofore there has been a great difficulty experienced in providing a satisfactory hinging or turning arrangement for the upper sash. In this invention the upper sash is made in two parts—namely, an outer sash and an inner pivoting sash. The sliding sash and an inner pivoting sash constitute a frame in which the inner sash is pivoted. The inner sash is, or may be, pivoted by means of vertical pivot pins at the centre of each cross-rail, which pins work in sockets in the cross-rails of the outer sliding sash. The outer sliding sash is preferably deeper cross-rails than usual, to ensure that the inner outer sliding sash is weather-tight in the outer sliding sash, which latter is provided with weather strips, which are provided with a flange or rim which is adapted to engage the inner cross-rail of the inner sash. The cross-joint is below the inner sash, and the upper cross-rail of the lower sash, when the window is closed. To prevent water coming in through the joint between the inner cross-rail of the upper sash, the upper pivoting sash is

* All these applications are in the stage in which opposition to the grant of Patents may be made.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

[illegible]

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered
Kanturk R.D.C.	T. Guiney, Clerk, Board-room, Workhouse, Kanturk, Co. Cork ..	May 2	
Wanstead U.D.C.	Council's Surveyor, Wanstead, N.E.	May 3	
Bromley R.D.C.	A. Williams & Sons, Engineers, 14, Victoria-street, Westminster ..	May 5	
Com. of Second Presbyterian Church	Robert & Heron, Architects, Scottish Provident-bldgs., Belfast ..	No date.	
Block of Dwelling Houses, Clonwyne-street, Belfast.	W. J. Moore, Architect, Royal-chambers, 35, Royal-av., Belfast ..	do.	
Princess, Mersham.	Liddle & Brown, Architects, Prudential-bldgs., Mosley-st., N.W.C.T.	do.	
Palace Main Level Heating and Building Walls	Mr. Wardlaw, Colliery Manager, Maesteg ..	do.	
British Church, Eastleigh, Hants	J. Wills & Sons, Architects, Victoria-chambers, Derby ..	do.	
Recessing Ground and Laying Gas Mains	Engineer, Gas Office, Station-road, Horley, Surrey ..	do.	
Excavating Ground for Steel Tank	do.	do.	
Concrete Work in Connection with Steel Tank	do.	do.	
Cost on of Schools	Stockport Education Committee .. A. Lawton, St. Petersgate, Stockport ..	do.	

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
Chief of Works	Henley & Wallingford Jt. Hos. Bd.	22. 10s. per week	April 12
House Foreman and Storekeeper	Hampstead Borough Council	22. 2s. per week	April 14
General S. & Revolver.	Brentford Union	See advertisement in this issue	April 25

Those marked with an (*) are advertised in this number.

Competitions, xvi.

Contracts, iv. vi. viii. x.

Public Appointments, xvi. xvii.

TENDERS.—Continued from page 393.

LIVWIT MAJOR.—For erecting a Congregational chapel. Messrs. Cook & Edwards, architects, Bridg-		LONDON.—For electric lighting and heating of Museum-buildings, Walworth-road, Southwark, S.E., for the Southwark Borough Council:—	
E. Giffard .. £1,280 0 0	Knox & Wells .. £1,370 0 0	Heating.	Lighting.
Free Bros. .. 1,408 0 0	J. Chatterton .. 1,340 5 0	Ventila-	ting.
Day & Tapp .. 1,486 8 0	Llantwit .. 1,378 13 8		
W. A. Cooke .. 1,400 0 0	Major* .. 1,340 5 0		
My .. 1,389 0 0	R. Jones .. 1,313 0 0		
LIVWITMA.—For erecting a power-station at Liverpool, for the Glamorgan Coal Co. Ltd. Messrs. A. G. Evans, Williams, & Evans, architects and engineers, Pontypridd:—			
C. Jenkins & D. Davies .. £5,204 0 0			
W. H. Colley .. 5,292 0 0			
W. E. Williams .. 5,431 17 5			
J. Edwards .. 5,596 0 0			
W. Turner & Sons .. 5,516 0 0			
Burns, Chap- .. 5,516 0 0			
lin, & Co.			
LONDON.—For the erection of stables, Greenmore Road, Barking, S.E., for the Southwark Borough Council. Mr. A. Harrison, Borough Engineer, Town Hall, Walworth-road, S.E.:—			
Johnson & Co. .. £5,690 0 0			
R. F. Evans .. 5,817 0 0			
E. Ford .. 5,874 0 0			
Burman & Sons .. 5,890 0 0			
J. Hume .. 5,890 0 0			
J. Marshall .. 5,979 0 0			
W. J. Bay .. 5,981 0 0			
Chaw .. 5,981 0 0			
LONDON.—For the construction of sewers in Dovecot-square and Queen-street-place, for the Corporation of the City of London:—			
O. W. Killick & Co. .. £2,030			
LONDON BOARD OF EDUCATION TENDERS.			
Woolwich, Deansfield-road (Heating Apparatus).			
J. Grundy .. £960 0 0	R. H. & J. Pear-		
Parsons & Sons .. 825 0 0	son, Ltd. .. 825 0 0		
W. J. Laid .. 791 0 0	J. Deifies & Sons, Ltd. .. 147		
W. N. Haden & Sons .. 791 0 0	Houndsditch* .. 691 15		
FOR PAINTING SCHOOLS.			
Reuben Green, N.E., Olga-street (Old and New Portions).			
W. Silk & Son .. £221 0 0	A. J. Sheffield .. 215 0 0		
W. J. Laid .. 215 0 0	Barrett & Power .. 168 0 0		
W. J. Laid .. 215 0 0	A. W. Derby, 60, Mayfair-avenue, Hford* .. 154 0 0		
G. Munday & Sons .. 190 0 0			
City of London, Greystoke-place.			
E. Green .. £145	W. Densham & Sons .. 277		
J. F. Laid .. 100	W. Hornett, 17, Houghton-street, Strand* .. 69		
Dulwich, Creek-road (Old Portion and J.M.).			
E. Green .. £178 7 6	G. Munday & Sons .. £140 0		
D. Laid .. 156 0 0	W. H. Laid .. 139 10 0		
W. J. Laid .. 154 10 0	E. Proctor & Son .. 138 0 0		
C. J. Laid .. 148 10 0	H. Groves, Stock-		
W. J. Laid .. 148 10 0	well-street, Greenwich* .. 134 0 0		
Dulwich, Belvedere-road.			
W. J. Laid .. £199 0 0	Maxwell Bros., Ltd. .. £119 0 0		
W. J. Laid .. 190 0 0	W. H. Laid .. 105 0 0		
W. J. Laid .. 147 0 0	E. Proctor & Son, 328, High-street, Plumstead* .. 90 0 0		
W. J. Laid .. 146 0 0			
W. J. Laid .. 134 10 0			
W. J. Laid .. 124 15			
Fulham, Sherbrooke-road.			
C. Gurling .. £269 10 0	Lathey Bros. .. £257 0 0		
R. S. Ronald .. 340 0 0	E. B. Tucker .. 199 0 0		
Spencer, Santo, & Co., Ltd. .. 311 0 0	W. R. & A. Hild,bury-road, Ham-		
J. & M. Patrick .. 299 0 0	mer-smith* .. 183 15 0		
Lole & Co. .. 268 12 6			
J. Garrett & Son .. 264 0 0			
Islington, E., Ecclesbourne-road.			
Patman & Fothering-	A. Porter .. £203		
ham, Ltd. .. £270	G. Neal .. 200		
Marchant & Hirst .. 266	Woolaston Bros. .. 198		
R. Woodlason & Co. .. 257	J. Grover & Son, Wilton Works, Islington* .. 198		
McCormick & Sons .. 236			
H. Bouscous .. 216			
Islington, W., Calcutt-road.			
Patman & Fothering-	H. Bouscous .. £164 0		
ingham, Ltd. .. £182 0	W. Martin .. 150 0		
A. Porter .. 174 0	G. Kirby .. 149 0		
G. S. S. Williams .. 169 0	Stevens Bros. .. 142 0		
F. W. Harris & Co., Ltd. .. 155 0	J. Stewart, 174, West Green-rd.* .. 108 16		
Kensington, S., Allen-street.			
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W. Hayter .. 184 14 0	C. G. Jones, 109, Ewart-road,* .. 144 10 0		
J. & C. Bowyer .. 175 0			
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T. Cruwys .. £228 16	Holloway Bros. (London), Ltd. .. £119 0		
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G. Foxley .. 142 0			
G. Neal .. 140 0			
J. Peattie .. 131 0			
F. Chidley & Co., Ltd. .. 125 0			
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F. Chidley & Co., Ltd. .. 124 0			
W. Chappell .. 129 0			
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W. Sawyer & Son .. 151 5			
Wandsworth, Eltham-street.			
W. & C. Brown .. £395	R. S. Ronald .. £230		
R. A. Jewell .. 274	J. Garrett & Son .. 221		
J. Carmichael .. 255	E. Flood .. 210		
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Lattay & Co. .. 17,215 15 6	D. Davies .. 14,459 0 0		
Jones Bros. .. 16,935 0 0	W. Bowers .. 13,980 0 0		
L. Davies .. 16,935 0 0	J. G. Thomas .. 13,900 0 0		
H. Brown .. 16,923 19 8	J. Linton, Newport .. 13,403 0 0		
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S. Shepton .. 15,827 0 0			
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J. Lewis 1,828 0 0 A. Rusbach 1,600 10 7
A. Richards 1,800 0 0 J. Thomas 1,748 0 0
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son £1,895 10 0 E. Dusham, St. Albans* 1,638 0 0
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& Son £581 11 6 shaw £419 13 0

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Hill & White 475 1 6 R. Parker 412 1 9
J. Cochcroft 470 11 9 J. W. & E. Sugden 411 0 0
B. Riley 460 0 0
Ferro Concrete Co. 430 0 0

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bury, N.* 235 0

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T. de man H. & C. Spack-
Bros. 1,568 7 6 man, Swin-
K. Flewelling 1,517 18 6 don* 1,251 0 0
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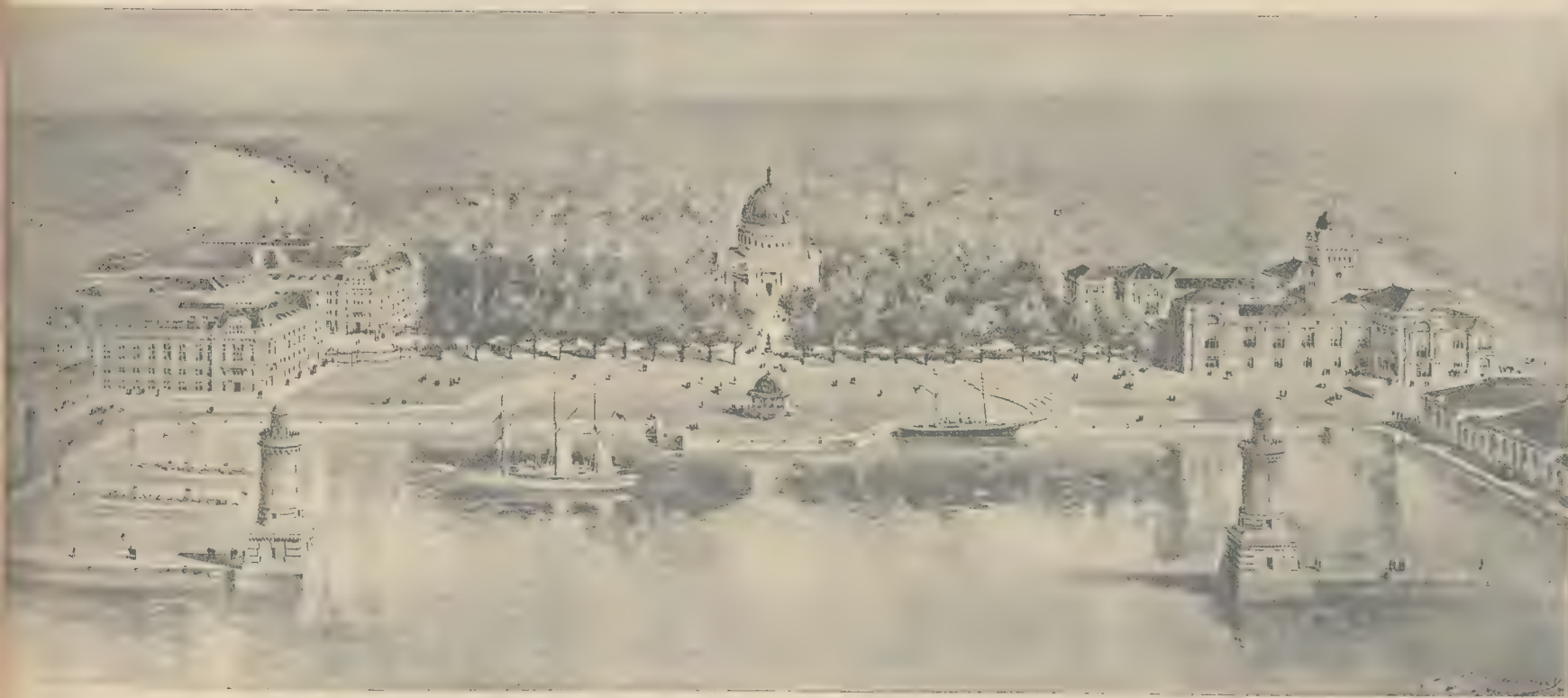
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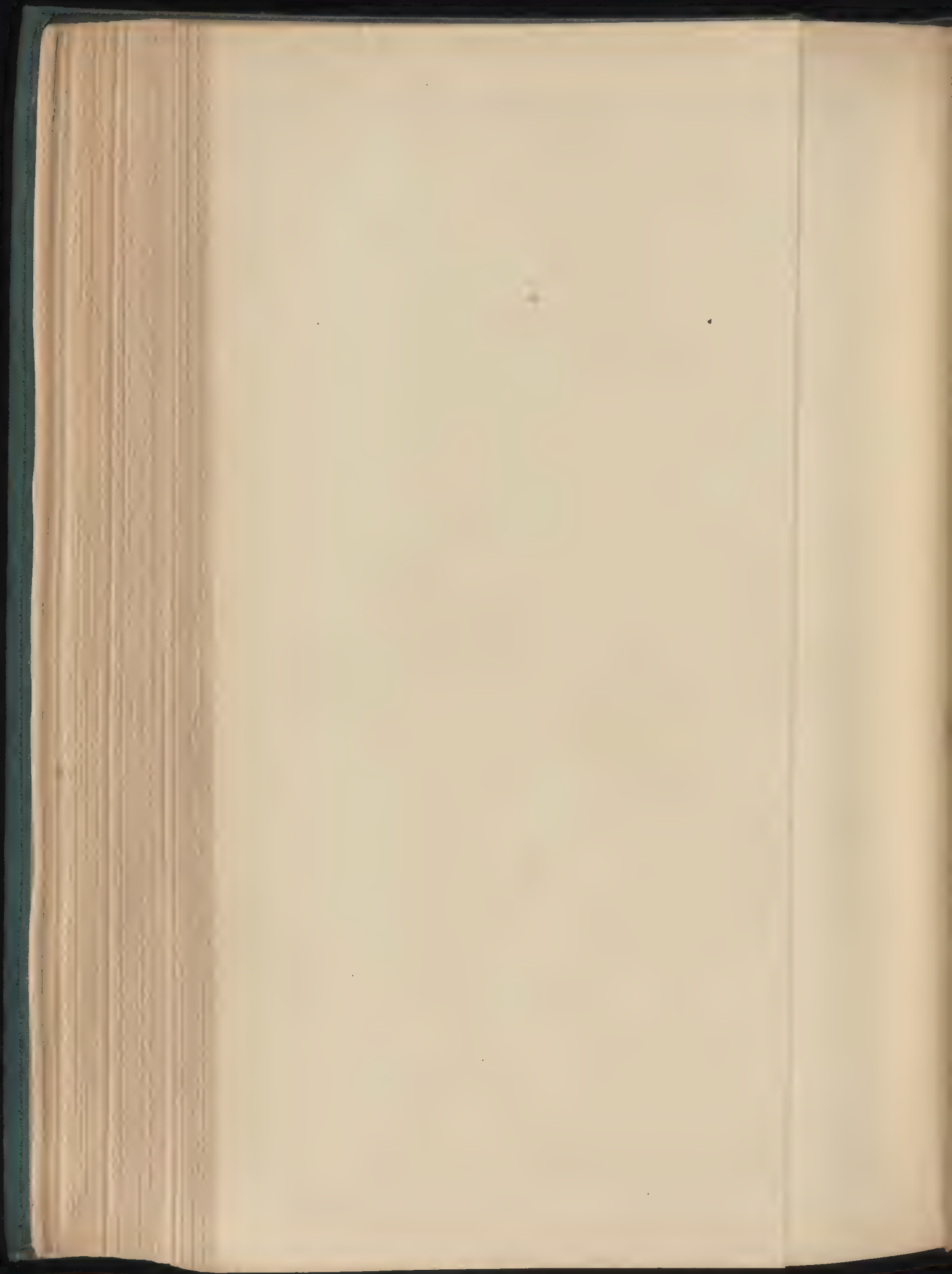
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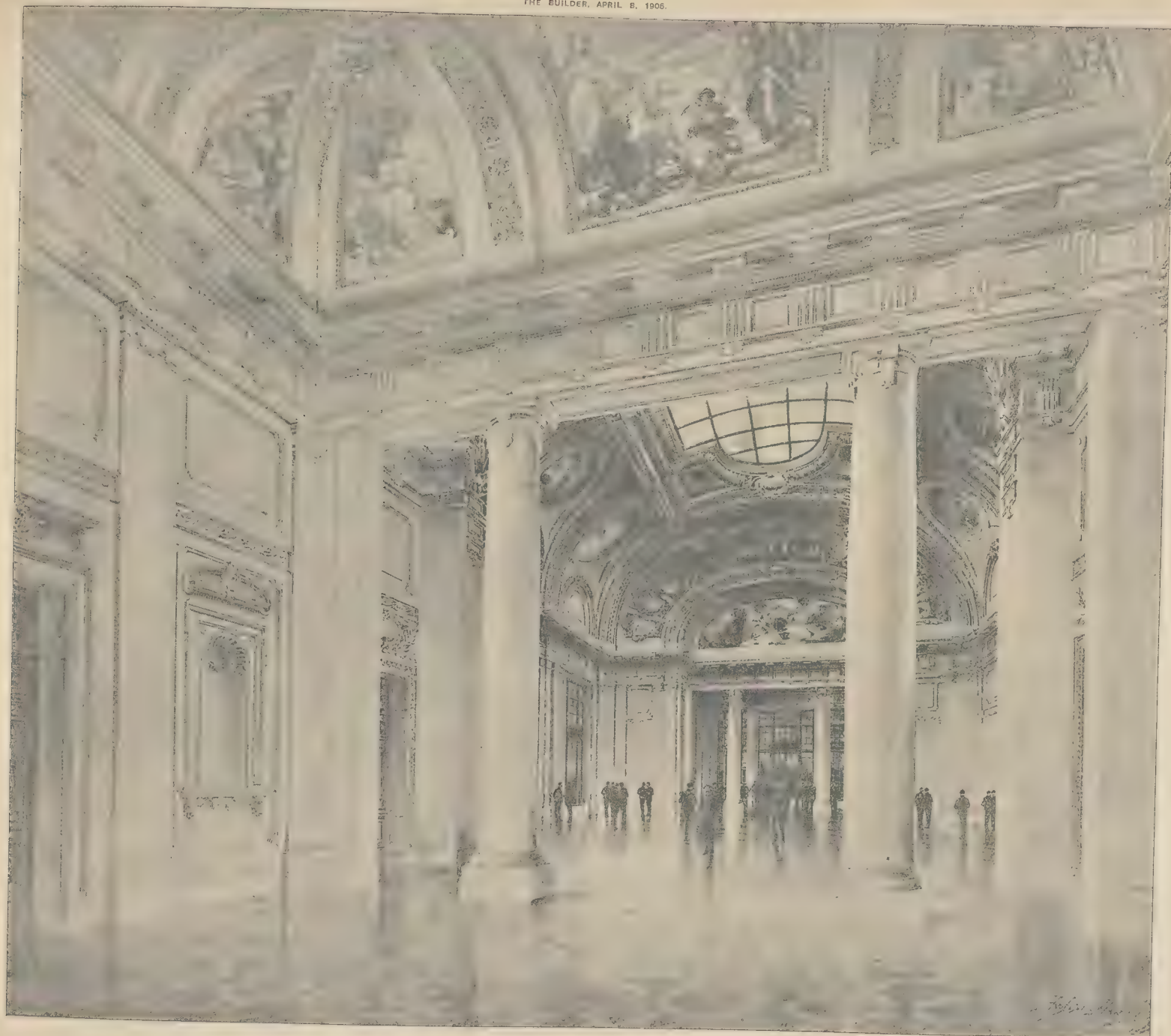


THE UNITED STATES NAVAL ACADEMY, ANNAPOLIS. MR. FINEST FLAG ARCHITECT.
GENERAL VIEWS.

THE UNITED STATES NAVAL ACADEMY, ANNAPOLIS.—MR. ERNEST FLAGG, ARCHITECT
CENTRAL ENTRANCE TO MEMORIAL HALL AND CADETS' QUARTERS.

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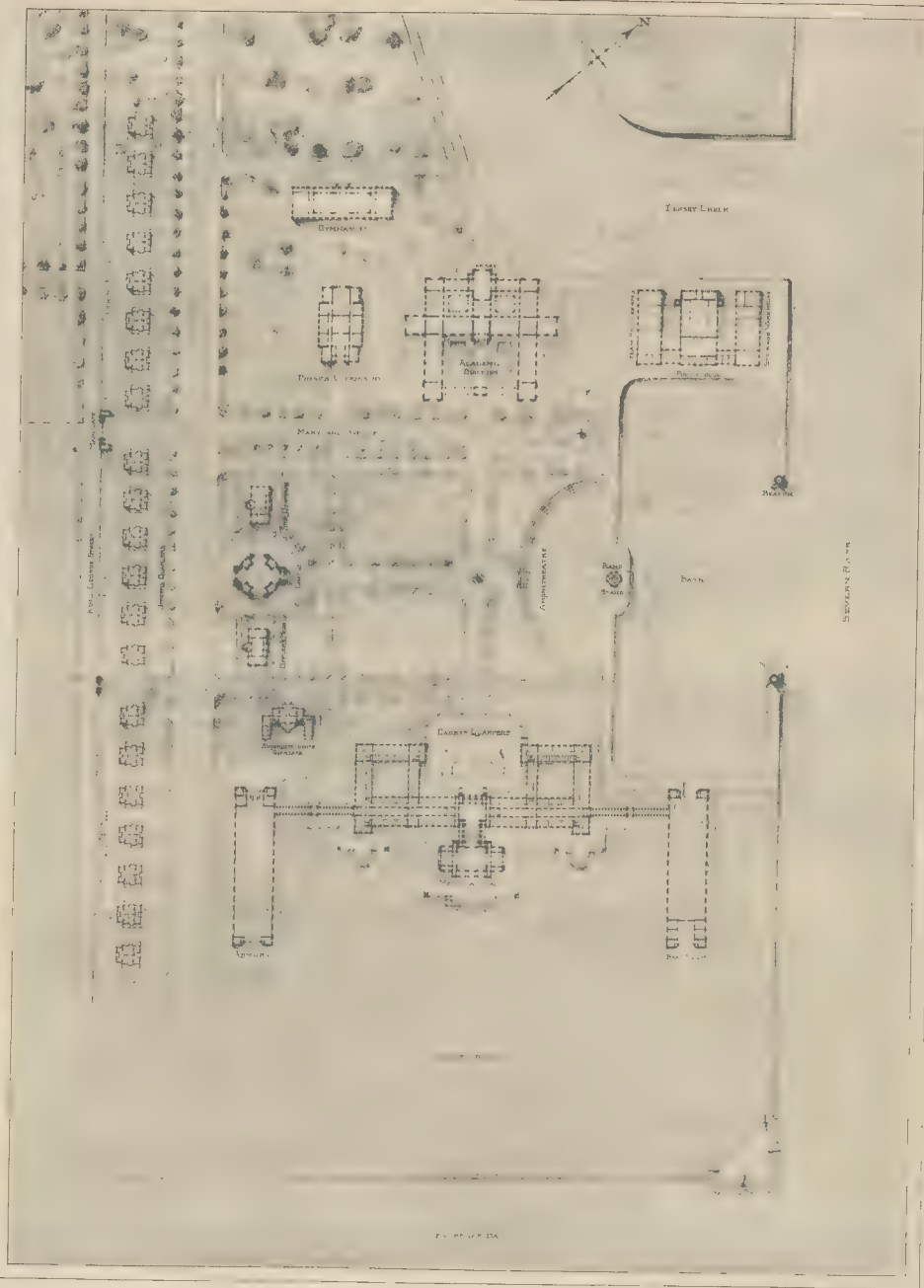


THE UNITED STATES NAVAL ACADEMY, ANNAPOLIS.—MR. ERNEST FLAGG, ARCHITECT
THE MEMORIAL HALL.

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THE CHAPEL.



GENERAL PLAN.

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The Builder.

VOL. LXXXVIII.—No. 3243.

APRIL 15, 1905.

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Detail of Upper Part of Portico.	
Interior View.	
Door Casing, All Hallows, Lombard-street, E.C.....	Drawn by Mr. W. S. George.
Organ Case, All Hallows, Lombard-street, E.C.....	Drawn by Mr. W. Wildman.

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On the Northern Coast of Cyprus.



THE northern district of Cyprus, which consists of the Kyrenia mountains and the Cape St. Andrea peninsula, forms a straight coastline of about ninety miles in length, indented with insignificant little bays, and the only harbour which seems ever to have been constructed on its shores is the small and, at the present day, practically useless one of Kyrenia (otherwise called Tzerinia).

The monumental remains of this district are remarkable for their variety in age and style. Many of them are merely interesting as historical landmarks, such as the prehistoric and Hellenic cemeteries, but there are also mediæval buildings surviving of a very special artistic interest. The Castle of Kyrenia (Figs. 1, 2) is one of the most imposing fortresses of the Levant, even in its present dismantled condition and in spite of its degradation to the use of a convict prison. The great mediæval château and fortified place of Hilarion is one of the most remarkable souvenirs of the XIVth century in that semi-Oriental land of romance, where the vestiges of the Crusades and the traces of an evanescent Arab art are to be found on every hand. The peninsula is, perhaps more remarkable for possessing a series of curious Romanesque churches of the XIIIth century—evidently the remains

of an early colonisation from the Syrian mainland during the Latin kingdom of Jerusalem.

Kyrenia may be considered the centre of the district. On landing in its disused, silted-up port the traveller finds himself within the enceinte of a little town, but one from which all traces of the Middle Ages have disappeared with the exception of the wall on the western side, and its outline on the southern as defined by the massive corner tower, and by a few ruined archways surrounding the quay. The little port was slightly enlarged some years ago by the English Administration, but, owing to difficulties, the work was never completed, and the fragmentary traces of the older port of possibly Byzantine times still remain visible. Bases of two towers, which probably formed the "gate" of the harbour—a chain being stretched between—can still be identified.

The great castle of Kyrenia was completely transformed by the Venetian Government in the course of the XVth century. During this period almost all the serviceable mediæval fortifications belonging to the Serene Republic were more or less adapted to the changing conditions of warfare. Crossbows were giving way to arquebuses, and the use of artillery for siege purposes was rapidly developing. The Turks are credited with being almost the inventors of siege guns on a large scale, and certainly they organised the modern system of mobile armies of a type quite different from the levies of feudalism. The Italian republics were the first amongst European

states impelled by force of such circumstances to provide against the impending Asiatic aggression which threatened to overwhelm Europe at the close of the Middle Ages.

In adapting the obsolete castles of the Middle Ages to the use of artillery, the Venetians simply added to their almost invariably square outlines a thick coating of earthwork supported by an outer wall of masonry. On this thickened wall there was space for a battery within embrasures, and the angles of the work were furnished with circular towers to contain the heavy guns flanking the curtain. In the case of Kyrenia Castle the whole square of the castle was replanned to constitute, as it were, an immense bastion flanked by the two round towers, one at the north-west corner, the other at the south-east, against the only quarter from which an attack could be feared—the south-west. A small bastion of regular form was constructed at the south-west corner in addition, although its purpose is not very apparent.

Kyrenia Castle is the largest example of this peculiar treatment in Cyprus. The work of remodelling would appear to have been executed previous to the year 1544—a date inscribed on its western side. The much higher wall on the side facing the town, and perhaps the south-east tower, belong to a still later date, when the fortifications of Famagusta and Nicosia were being hastily prepared immediately before the great Turkish invasion. But at the period when Cyprus was gained by the Mohammedans and lost to Christendom a fresh development in artillery had

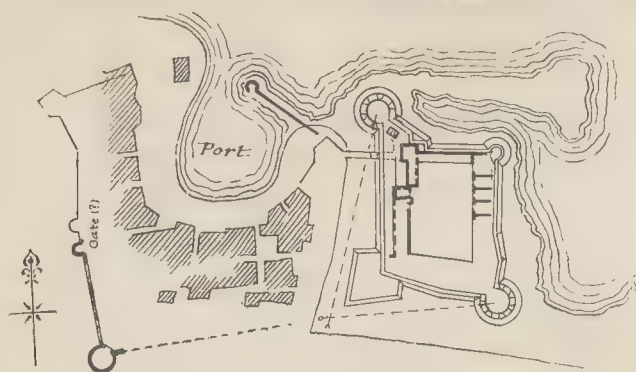


Fig. 1. Sketch Plan of Kyrenia and its Castle.

brought about a revolution in the idea of fortification. Earthworks pure and simple—much like those of the present day—were coming into use, and the mighty stone walls of Kyrenia were deemed useless by the Venetian engineers commissioned to report on them in 1565.

The mediæval interior of Kyrenia Castle is much more ruined than that of Famagusta or the small mediæval fort of Limasol, both of which fortresses were treated in a similar manner by adding immense earthworks supported by stone facings. At Kyrenia the great wall facing the sea is still intact, crowned with its remarkably preserved battlements of the XIIIth century. But on the other three sides of the enclosure little is to be seen but the rugged walls and broken arches of what were at one time the evidently sumptuous apartments of a royal chateau. More especially on the western side the traces of a magnificent upper story remain. Here massive corbels, which must have supported an outer gallery and corner turrets in the well-known style of the south of France, still survive. The royal apartments of this upper story were levelled at the time of the conversion of the mediæval castle into an earthwork of the XVth century, but their traces remain sufficiently apparent at the present day to allow of a chapel with southward pointing apse being made out.

The main entrance of the castle seems to have passed beneath the "royal apartments." Over this entrance are some large windows, now blocked, which seem to have overlooked a barbican. This outer defence of the castle was swept away when the alterations of the walls

took place during the XVth century. In remodelling the walls of the fortress the Italian engineers enclosed an old chapel which stood outside, at the base of the north-west tower of the mediæval castle (Fig. 3). This chapel happened to come within the lines of the Venetian modifications of 1544, and, instead of being swept away, it became embedded in the fortifications—an almost unique case of the kind perhaps. At the present day its cupola has fallen in, and it has

the XVth century on the largest scale. Kyrenia is the centre of the eastern portion of the Kyrenia district. From the little town a road leads due west to Acheripitou and Lapathos, a road which formerly passed beneath the solitary gateway of the town in its western wall. One of the semi-circular towers which flanked this gateway is still standing.

In the neighbourhood of Kyrenia the most celebrated monument is the Premonstratensian Abbey of Bella Pais. It is one of the most remarkable ruined monasteries in the world. Although abandoned by its original founders more than three centuries ago, the greater part of it still stands in remarkable completeness, such as would be difficult to parallel with a similar XVth century building in Europe. No trace of subsequent additions in the later styles of art, marking its adaptation to the needs of even the XVth century, interfere with its mediæval character. In a sense, it is almost intact as it was abandoned by its original occupants. The monastic institution had fallen into complete decay long before the Turkish invasion, and the Venetian Government took steps to suppress what had become a religious scandal.

The abbey was evidently built as we now see it during the latter half of the XIVth century. Its foundation was



Fig. 2. Kyrenia Castle from the N.W.

become a mere ruin; on the floor are remains of a rich marble pavement in the Venetian style.

The castle of Kyrenia is still an interesting relic of the historic past, although the ordinary visitor finds it difficult to trace the vestiges of its once palatial splendour amidst the degraded associations of a Levantine prison. Internally it is but a ruin, externally it still presents in great completeness the aspect of the early artillery fortress of

much older, but, like so many monastic institutions in Europe, especially those of the Benedictines, the buildings were rebuilt on the eve of impending ruin and dissolution. Possibly the appearance of disasters to which Cyprus was subject in the XVth century may have induced the investment of hoarded funds in new buildings.

At the present day the portions of the abbey best preserved are the refectory, with its splendid undercroft on the north of the cloister garth, and the main church on the south with its nave, narthex and certain attached chapels. It seems almost probable that the lodging for the abbot, designed to occupy the western side of the quadrangle, was never actually built, as hardly a trace even of the foundations of this portion of the building exists. The eastern side of the cloister is bounded by the ruined dormitory of the monks. This magnificent apartment, with the chapter-house and "common" beneath it is quite complete, with the exception of the vaulted roofs of both stories, which have disappeared in some parts more than 100 years ago. The side walls with their niches and cupboards, etc., marking the

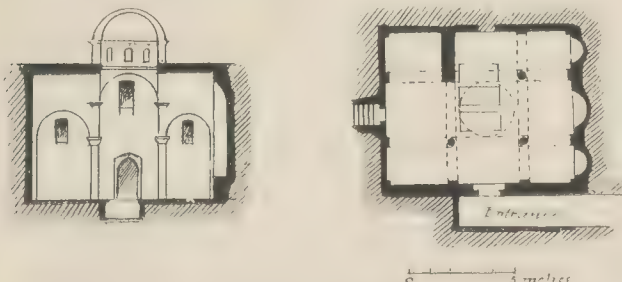


Fig. 3. Ancient Church enclosed within Earthwork Additions to Kyrenia Castle.

carved divisions of the dormitory, are still intact, enclosing a space overgrown with trees and jungle. The chapter-house was a square in plan, with a central column carrying the ribs of four quadripartite vaults, of which the wall corbels remain in fair preservation and exhibit an interesting series of XIVth century sculptures. The central column suggests the well-known characteristic of our English monastic chapter-houses.

To the east of Bellapais stands another monastery of a very interesting character. It is called "Antifontissa," meaning, perhaps, "Our Lady of the Echo." Partly of Byzantine date, it has been much altered and added to in the Gothic style. M. Enlart, in his great work on the Gothic art of Cyprus, devotes some space to this little monastery, describing the Gothic porch as the finest specimen of the style now remaining in the island.



Fig. 5. Byzantine "Para-ecclisia" or Roadside Chapel, Kormakiti.

The church is of the square Byzantine form, covered by a dome—a plan which seems to have been common in Cyprus before the Byzantine-Gothic style was introduced. The interior is still covered with old frescoes, and the iconostasis is a magnificent specimen of the usual type of Levantine XVIth century wood carving. Father Stephen de Lusignan, in describing the different religious houses of Cyprus, mentions that of Antifontissa as having been built by his grandmother, Isabella Perez, and that his brother died in it as a monk; it would, therefore, seem probable that in the XVth century this monastery was of the Latin Church, but the church is certainly of much older date than that of the historical grandmother.

Not far from Antifontissa stands the monastery of Melandryna. Here there is but little to detain the student. A recent German traveller has given it as

his opinion that the church occupies the site and is built out of the remains of an ancient temple—a very probable supposition considering the site and the character of the masonry. The village churches in this neighbourhood are being sacrificed to a strange mania for rebuilding. In no part of the world has there probably ever been such a destruction of venerable old churches, always picturesque if not necessarily architectural, as in Cyprus during the last thirty years of peace and plenty. The object in view—as far as can be judged by appearances—is a mere desire to have a new building in place of the venerable temple consecrated by the use of untold ages. The buildings which take the place of the old Gothic-Byzantine churches are certainly amongst the ugliest and most inartistic that the wit of man has hitherto invented. They consist invariably of a square chamber about 80 ft. by 30 ft. in length and breadth, covered by a stone barrel vault of pointed form. The supports to this vault are of the flimsiest, and in some cases these modern churches have come to grief, and the vault has collapsed as soon as the wooden supports within were removed. For architectural character these new churches depend upon some clumsily-imitated mouldings, keystones, etc., of the European "classic" kind, which are supposed to decorate the immense square openings for doors and windows piercing every available wall. Attempts at sculpture may be considered as faintly reminiscent of the Byzantine age, but in reality they are too rude and clumsy to admit of any criticism.

On the western side of Kyrenia, the great straggling village of Lapithos-Karavas has hardly any of its once numerous churches surviving the rebuilding epidemic. The monastery of Acheripitou is still, however, untouched, and the fine Gothic-Byzantine church nearer the sea, which may have been a village church, owes its preservation to its abandonment and to the disappearance of the village to which it once belonged. This church is parallelogram in plan, with a central space covered by a dome carried on four arches, two of which are against the side walls. The four central arches are carried on ancient columns from some classic temple. The interior is a particularly pleasing example of the style.

The convent of Sina or "Sinai" (Fig. 4), perched on a steep hill at the western end of the Kyrenia range, is interesting from many points of view. It belongs to the great convent of the same name



Fig. 4. Monastery of Sinai.

in Arabia, and enjoys exemption from the ordinary conditions of the native church of Cyprus. On this account it might have been hoped it would escape the general destruction of such monuments at the present day. But, alas! this interesting little building, possessing a singular chapel in the Gothic-Byzantine style, has recently been subjected to the prevailing fashion and the chapel is rebuilt in "imitation" of the original. The original would seem to have been designed with a curious barrel roof of timber with stone pointed arches following the timber outline and supporting it and the carved ceiling. The old building has now been swept away, and the modern substitute is decorated with fragments of its carved details and a new iconostasion resembling a shop front.

Within and around the monastery of Sinai are innumerable grey granite columns about 10 ft. high. These evidently mark the site of some important ancient building no longer in existence. The neighbouring village of Vasilia contains the traces of an imposing ruin, and this, in conjunction with the singular name "Vasilia," may suggest that possibly an important Byzantine palace as well as the monastery once occupied the site in days long before the Latin occupation of Cyprus.

Continuing westwards along the coast, the most important monument of art in fair preservation is the Maronite church of Kormakiti. It is simply a long nave with a barrel vault ending in an apse, but at the west end rises a very remarkable belfrey in two stories, the old west end and belfrey being about

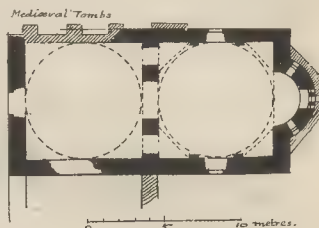


Fig. 6. Plan of Ruined Church, Margi.

35 ft. or 40 ft. high. The belfrey, reminding one of the Famagusta churches of the XIVth century, has two pointed-arch openings below and another of the same size above, all ornamented with the heavy boulet-mouldings peculiar to the Cyprus style. It forms a remarkable

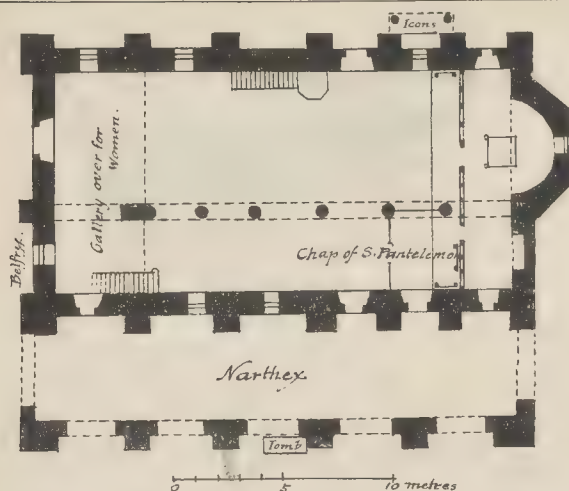


Fig. 7. Plan of Monastery Church, Myrtou.

landmark in this part of the island, and reminds the student very much of Normandy or even England. Here again the demon of destruction will soon be at work, and the Maronites are determined not to allow their orthodox neighbours to surpass them in efforts to obliterate the ancient history of the district as represented by the old village churches.

Although the Cypriotes have destroyed their old village churches wholesale of late years, they seem to have a singular superstition in preserving the ruins and the mere sites of what are called "paraecclasia," or what would be reckoned in Europe as wayside shrines and rural chapels. Numbers of these little buildings remain at cross-roads and in out-of-the-way places amongst the mountains, or linger as landmarks on the great plain of the Messaria. They have never, as a rule, been rebuilt, but are allowed to crumble away in an interesting state of decay, and their ruins often afford the most delightful study for an archaeologist. Some few of these interesting buildings were once the parish churches of mud villages which have disappeared centuries ago, leaving these their only record. In the western part of the Kyrenia district there are many of these roadside shrines. At Ayios Georgios, near the coast is a

well-preserved XVth century example, but roofless; near the village of Kormakiti, at the cross-roads is a small chapel in last stage of squalid neglect, but still possessing its frescoes on walls and vaulted roof (Fig. 5). But one of the most interesting of these ruins is the Byzantine church of Margi (Fig. 6), near Myrtou, built with the usual thin bricks and wide mortar joints and surrounded with external supports added in the Gothic period. This ruin must represent the monastic church of some important foundation, perhaps the original of the present Myrtou monastery.

The monastery of Myrtou is an important example of a modern Cypriote religious house. The range of buildings surrounding the monastic church in the usual parallelogram form is of no particular character. The church (Fig. 7) appears to be an ancient building more than once altered and enlarged. On its south side it has a curious arcaded loggia or narthex of imposing character—a feature which is often found in Cyprus churches of the last few centuries. Under the central arch of this loggia is the altar tomb of the person who built it, but the inscription has long since disappeared from the soft gypsum slab. Entering the church, the eye is attracted by a very venerable-looking arcade of squat

columns with cushion capitals, which divides the interior into two naves in the way which is common in Cyprus churches. The northern aisle or nave has evidently been rebuilt with a greater width in comparatively recent times. At the end of the southern nave is a shrine protected by iron screens, forming what would be considered a side chapel in a Latin church. Within are wonder-working icons of S. Pantalemon, illuminated by little silver lamps and surrounded by all the somewhat *bizarre* adornments of the Orthodox Church, including some curious wax exvotos of human heads coloured to the life. Although some modern wood-carving has been added in recent years, much of the ancient woodwork (some mediæval) remains. The inscriptions on some of the icons would interest any student of mediæval Greek script. The ecclesiastical furniture of the monastery is remarkably rich: Chalice, hand-crosses, censers, and large quantities of richly-embroidered vestments are stored in the various cupboards within the church. Most of these ornaments are probably of European manufacture, as there is little trace of a local character. A curious silver



Fig. 8. Belfry of Myrtou Monastery.



Fig. 9. Kathari Monastery.

tabernacle, used in the Good Friday service, representing a church with five cupolas, is evidently XVIIth century Venetian work. Externally the church possesses a picturesque belfry (Fig. 8), and an elaborate iconostasion for exhibiting icons to a crowd within the monastic courtyard. This latter feature is, however, comparatively modern.

The little monastery of Kathari is a few miles to the east of Myrtou. It is preserved with the exception of the church interior, which has been completely cleared of all its ancient furniture. Externally the church possesses three of those curiously characteristic Cypriot doorways, with the chevron moulding and heavy hoodmoulds of a square room enclosing their pointed arches. The monastery buildings of Kathari have never been completed; the buildings

are now turned to the use of a farm-
house.
In this most western portion of the
Kensington district the village churches
were almost entirely disappeared. A
very small example still survives at
Kempston, but its appearance of venerable
antiquity is its only interest, as it pos-
sesses no architectural character. The
typical barn-like churches of modern
days can be described wherever a village
church is in the landscape; their brilliant
red roofs of "French" tiles and the
fantastic attenuated campanile at one
end of the block recalling the general
appearance of a small manufactory or
mill with its chimney so characteristic of
modern Europe.

NOTES.

We are glad to find that the
London County Council seem
at last to see their way to a
possible site for their much-needed
County Hall, and we think the West-
minster site proposed has much to
recommend it. It is somewhat alarming,
however, to know that a design by the
architect to the County Council is already
made and hung up in the Council room.
It is understood that the perspective
views and outline plans of the proposed
County Hall, which by courtesy of the
Council we were enabled to see, are merely
intended to show the possibilities of the
selected Embankment site. It is to be
remembered that such is the case, for there is
much danger in making a pretty picture
for the deliberations of a public body
before the building is planned. We
should have thought that general infor-
mation as to the accommodation to be
obtained would have been sufficient at
the stage of the proposal. Public opinion
will certainly not be satisfied by anything
short of an attempt to obtain the finest
possible building by a great architectural
competition. This is an opportunity
second only to that of the Houses of
Parliament, and the most must be made
of it. The site has frontages of 800 ft.
on the river, 240 ft. to the bridge approach,
and 760 ft. to Belvedere-road. The
scheme indicates continuation of the St.
Thomas's Hospital embankment, while a
terrace formed by a projecting basement
is provided for the use of members only.
It will be at once seen that Somerset
House has influenced this work of the
Council's architect, Mr. W. E. Riley, and
further, the grouping and detail are also
based on the great work of Chambers.
The dignity and restraint of Somerset
House, however, are missing. A large
circular mass rises harshly in the centre of
the river front, and two low cupolas are
placed near the ends of the buildings, but
the lack from the fronts. The point of
view in the picture is taken too close to
the subject, and gives the impression that
the project is not well considered in rela-
tion to its environment. Some design
in plan, as well as façades, is required for
a great conception of this order. The
growing importance of the London
County Council, combined with the
nature of the site, demands the
best possible work that can be produced,
and it is therefore to be hoped that a
competition, or some other process outside

the actual work of Spring Gardens,
will be publicly instituted to bring this
about.

Thames
Flood
Prevention.

RECENT rains have served to
demonstrate the amelio-
ration gradually being effected
in the condition of the Thames valley by
judicious improvements to the weirs on
the upper reaches of the river. This
result is largely due to the efforts of the
Thames Floods Prevention Committee,
by whom the Conservancy Board have
been repeatedly urged to take measures
for dealing with heavy rainfalls. Thanks
to the construction of new weirs and the
enlargement of existing works of the
kind, water can be passed on from point
to point with such facility that, whereas
a few years ago 2 in. of rain would have
involved serious flooding, it now causes
little inconvenience to those dwelling near
the river banks. Notable improvements
have been made in the neighbourhood of
Windsor, where the new weir enables the
lockkeeper to let the water flow freely on
to Datchet. To relieve that place a new
tumbling bay has been constructed at
Old Windsor, while lower down Bell Weir
is in course of being remodelled. Similar
works, with equally beneficial results,
have been carried out higher up the
Thames, and it seems at last that the
disastrous floods that once were so fre-
quent will be almost entirely prevented.
While fully admitting the good work
performed by the Thames Conservancy,
we must once more say that, in addition
to the improvement of regulating works,
reservoirs for the storage of flood waters
are still urgently required. Besides their
usefulness for purposes of control, such
reservoirs would be of immense economic
value to the inhabitants of the valley and
of the Metropolis.

Electric
Traction.

MR. B. J. ARNOLD's presi-
dential address to the joint
meeting of the American and
English electrical engineers at St. Louis
was discussed at the Institution of
Electrical Engineers this week. The
subject chosen by Mr. Arnold was the
problem of the alternating current motor
applied to electric traction. Although
he did not anticipate that the steam loco-
motive would become obsolete as rapidly
as horse tramways did in the United
States, yet, since it can be demonstrated
that suburban traffic can practically
always be worked more economically by
electricity than by steam, it was certain
that the electrical equipment of railways
would now take place rapidly. The New
York Central and the Pennsylvania
Railways alone were expending nearly
seventy million dollars in equipping
portions of their lines electrically. The
recent great improvements in the design
of alternating current motors was perhaps
the main factor in the rapid development
that was taking place. In this con-
nexion Mr. Creedy's paper on the alter-
nating current series motor, which was
read at the same meeting, proved of great
interest. Unlike most of the papers read
to the Institution, a serious attempt was
made to grapple with the problem
theoretically, as well as experimentally,
and, in our opinion, this will make the
paper useful both to those who have to
design the machines and to consulting
engineers who have to decide whether

they are better or worse than other kinds
of motor. Mr. Creedy's theoretical
results practically agree with those pub-
lished by Professor Blondel two years ago,
and although in many points of detail they
are open to criticism, yet, as his experi-
mental results show, they are trustworthy
in practice. The experiments were made
in Professor Ayrton's laboratory at the
Central Technical College, and the data
obtained are of the greatest value to
electrical engineers.

Stained Glass
Window by
Mr. Henry
Holiday.

WE have had an oppor-
tunity of seeing one of three
large windows, by Mr. Henry
Holiday, to be placed in the large hall of
the Museum at Preston, to represent
Literature, Art, and Science in ancient
Greece, ancient Egypt, and modern
Europe respectively. The three windows
form to some extent a feature by them-
selves, so that the eye will be able to take
in the whole effect of the design. Their
shape is oblong, somewhat high and
narrow, as suited to a classic building.
The present design is divided into three
compartments, each occupying about a
third of the height of the window. In
the top section we have a group of the
artists and scientists of ancient Greece
standing and sitting about, after the
manner of the Parnassus fresco by
Raphael in the Vatican. In the centre is
a free representation of the Panathenaic
procession of the Parthenon frieze, youths
on horseback riding from left to right.
In the lowest section, as centre-piece, is a
standing group of the three great poets,
Æschylus, Sophocles, and Euripides, and
at the sides two green bronze statues of
Sappho and Homer. A severe classic
note is obtained by the architectural
setting of the pictures, a scheme of Ionic
columns and antefixæ in silvery white.
Another decorative feature introduced is
a festoon which crosses the centre panel
about the level of the horses' legs. There
is much fine virile drawing in this window,
and the group of poets may be mentioned
as particularly fine, strongly reminiscent
of figures in the Raphael "School of
Athens." There is also some very good
colour, and the total colour effect is satis-
factory. This is eminently an example
of a stained glass window made to emulate
fresco, full and free in treatment; and
in a classic building this is not only
legitimate but almost necessary. There
is very little white glass introduced, and
the high lights are in a prevailing greenish
tone. This and the green of the festoon
and the darker blue-green of the bronzes
sets off the rich blue of the sky in the
pictures and the touches of bright orange,
ruby red, and purple. The artist is to be
congratulated on a fine piece of work.

Exhibition of
Furniture, etc.

MESSRS. ELMOND & Co.
have an interesting exhi-
bition of furniture at the
hall of the Alpine Club. The furniture
is designed by Messrs. Charles Spooner
and Arthur J. Penty; and at the same
gallery may be seen metal work by
Mr. Edward Spencer, exhibited by Mr.
Montague Fordham, and textiles by Mr.
Edmund A. Hunter. A great part of the
furniture is of plain oak, in that style of
severe simplicity which is now so widely
admired. Some of the happiest and
most striking features of the designs

arise, as in all good design it so often happens, from the thoughtful treatment of problems of practical utility. A good example of the felicitous results which may be so obtained is to be seen in the bottom rails of the oak gate-leg table. These are so arranged, without any rapid curvature, as to tie the middle six legs together in the most effective possible way without greatly obstructing the foot room of those who sit at the ends of the minor axis of the elliptic table—an advantage which anyone who has used gate-leg tables of the old-fashioned type will know how to appreciate; and from an æsthetic point of view the rails thus treated are the most successful feature of an always charming design. In all the oak furniture, however, we fancy that the characteristic doctrine of rounded edges, also essentially utilitarian, is too largely prevalent; it sometimes contributes to a feeling of insipidity, a lack of crispness, in the total effect; it suggests the reflection that, wherever else glass-paper is used, such rounded edges at all events would be better left straight from the cutting tools, as they so often are in old woodwork. Another reason, doubtless, for this occasional feeling of insipidity is that Austrian oak has always been used in preference to the harder and more vigorous English variety. The latter is, of course, the more difficult and expensive to work, but the difference in surface and texture between the two varieties may be easily recognised at a distance equal to the length of a large room. Besides the plain oak, there is a considerable amount of furniture in polished mahogany—two large book-cases, a very charming old-fashioned sideboard inlaid with ebony, a fine dining table, and a number of smaller pieces. There is also a very beautiful walnut cabinet inlaid with ivory, and there is some very useful-looking painted furniture of a less expensive kind. Mr. Spencer's metal work and Mr. Hunter's textiles are also well worth seeing and studying, and contribute very much to the total effect of the exhibition. Amongst the latter should be noticed especially the splendid peacock hearth-rug and the very beautiful *portière* of the "Forest" pattern, which is perhaps one of the finest things in the exhibition.

We have seen better exhibitions in this Gallery than the present one, though it contains many good works. In the ante-room we find one or two water-colours, by M. Harpignies, whose water-colours, if he paints many of them, are at all events not often seen in exhibitions; No. 10, "After Sunset," is a beautiful little work. M. Hervier's "The Farm-yard," the largest picture in the ante-room, is a dingy and unattractive piece of pigment-plastering; M. Weiss's "A Silvery Day, Normandy" (3), if it does not answer to its title (for painters of this school cannot really produce anything bright and sunshiny, whatever titles they may give), is a fine work of its school. Among the other contents of the ante-room are two fine black-and-white studies by M. Lhermitte (35, 36), two figure sketches by M. Cremona (8 and 12), which are thoroughly bad style, and one of poor Georges Michel's unmistakable and

powerful landscapes, "Windmills" (14). In the large room the central picture is one of Israel's sad and depressing cottage interiors with worn-out and melancholy peasant figures; one is beginning to think that it is possible to have enough of these; the artist produced some works of great pathos and of grand artistic effect in scenes of this class; but when treated with less of artistic effect they tend to degenerate into squalor, which is not in itself a subject for art. There are some beautiful small works by M. Harpignies in this room, especially "The Lake" (52); an admirable little picture by Mauve, "Carting Sand" (56), showing that he could draw horses quite as well as sheep; a very fine little picture by J. Maris, "Canal in Holland" (57); one of M. Jacque's powerful but rather loaded tree-pictures, "Under the Old Oaks" (69), which may be characterised as Rousseau with the "go" taken out of him; a very fine example of Mr. Mark Fisher's work (77); another and also fine landscape by Michel, and a brilliant flower-piece by Fantin-Latour.

By the death of M. Meunier the world of art loses a sculptor who stood rather alone as the illustrator in sculpture of the artisan and the labourer; he may be said, in fact, to have been in sculpture somewhat what Millet was in painting, though he never reached the pathos and sentiment of Millet. The class of subjects which Meunier dealt with is not, in our opinion, specially suitable to sculpture, which is essentially an art of the abstract and the ideal; but Meunier had the insight to perceive (as far as his usual practice was concerned) that subjects of this class were best treated on statuette scale, in which the realism of dress, etc., is not forced upon one too violently; and his small bronze figures were always treated with vigour, simplicity, and a total absence of anything like pretentious or theatrical effect. As efforts to render real life in sculpture they will always have their value.

Messrs. Thomson & Pomeroy, of Wimbledon, have been appointed advising architects and assessors in respect of the designs submitted for a clock tower to be erected upon the site of the Obelisk at St. George's-circus. The competition is limited to architects practising within a radius of twelve miles from the circus. The obelisk, a block of limestone, was set up in 1771, and bears the name of Alderman Brass Crosby, elected Lord Mayor in 1770, who was committed to the Tower for releasing a printer of the Parliamentary debates who had been illegally arrested by an order of the House of Commons, and for imprisoning a messenger of the House. The obelisk marks the meeting-point of five main roads laid out through St. George's-fields, at a spot which, as it records, is distant one mile from Westminster Hall, 1 mile 40 ft. from London Bridge, and 1 mile 350 ft. from Fleet-street. It stands on the property of the Bridge House Estates Committee of the Corporation, who agreed to the removal of the old land-mark by the Southwark Borough

Council, subject, with other conditions, to its re-erection by them elsewhere and to the Committee's approval of the design of its successor. The proposed clock tower is the gift of a firm of tobacco merchants trading in the Borough.

THE SOCIETY OF PAINTERS IN WATER COLOURS.

At the exhibition of the Society of Painters in Water-Colour the central position at the top of the room is worthily occupied by one of the best things Mr. E. R. Hughes has exhibited there—"Wings of the Morning" (78). It represents a nude winged female figure flying across through the sky, her beautiful head in bright light; her limbs go into the shadow behind her, into which birds of night fly back from her presence, while in front she is accompanied by a whole crowd of bright birds and flowers going through the air with her. The figure is most conscientiously drawn and finished, and the whole work is equally good both in the technical and in the poetic sense.

The exhibition as a whole is full of interest and variety, to an even exceptional extent. As usual, the landscapes have the best of it, for water-colour is essentially a landscape art, and there are figure pictures which are highly finished but not interesting. Among the exceptions is Mr. F. Cadogan Cooper's "Molly, Duchess of Nons" (5), a figure from one of Mr. Hewlett's novels. This is a seated figure of a mediæval Italian lady clad in a gorgeous dress of blue and yellow, backed by a vertical crimson screen between her and the daylight, at the side of which is a distant glimpse of green undulating country and white towers, quite in the manner of a background to an early Renaissance picture; the whole thing, in fact slightly archaic, but it is an excellent piece of work. Mr. Robert Little appears this year as a painter of interiors with figures; "The Tudor Window Seat" (51) is not very interesting, but the study of an interior with a figure of a man working, with his head in bright light—"The Lathe" (89), is a most effective study which makes one think of Rembrandt. Miss Fortescue-Bridgford is always interesting; her "Hope dieth. Love liveth" (53) is not perhaps one of her greatest successes; it shows two standing figures closely grouped together, a young woman clad in mourning, and behind her and half hidden by her the nude figure of Love, whose arms she holds. Two great crimson curtains above her design that would work out well in statuary, or as a mural decoration on a large scale. Miss Rose Barton has two of her delightful pictures of children; the best, "O Lark, an pleasant is thy morning" (107), shows an interior with a very small child on tiptoe to look out of a window. Mr. Ann. L. L. figure pictures are disappointing this year, since though as fine as usual in colour and general design, two of them at least (17 and 24) show us such very unattractive personages; "The Daisy-Chain" (113), woven by two women, front of a fragment of Renaissance architecture, is more pleasing and is perhaps in every way the best of his contributions. Miss Munroe's "Sad October" (85) is a rather melancholy study, but not failed to win and her two small children amidst foliage; it gives the idea of being a study from life into which a certain poetic sentiment has been imparted by the artist; the treatment of the colour of the garments, which is very refined and artistic, serves also to remove the work from the plane of realism and give it artistic significance. Mr. Arthur Rackham's exceptional talent we have before fully recognised, but we nevertheless think that his works this year are more fantastic than ever in conception, and out of place in an exhibition of this high class. In his set of designs that sentiment and van Winkle he showed that sentiment and pathos are within his range; but his figure pictures here are only very clever jokes; he would do splendidly for Punch, but we do care to meet them in an art exhibition. Walter West sends one of his charming Quakeresses revolving before her writing-desk—"A Weighty Consideration" (11)—not quite so good as some of his previous exhibits, but he is to some of his most dangerous rivals. One of the most satisfying figure pictures in the exhibition is Mr. Arthur H. Marsh's "On the subject" (183); nothing can be simpler than the subject—a bare-legged girl in short skirts standing,

a high down, with her back to the spectator, about to take up her "washing" which is drying on the grass; there could hardly be less of a "subject," in one sense, but in Mr. Marsh's hands it becomes a quite complete and characteristic picture—a moment of life transferred to paper, with no detail admitted to interfere with its simple unity of effect. It is far more sensible to get a poetic impression out of simple life in this way, than to endeavour to make a subject poetic by giving it a fine name, as Mr. Tuke does in painting a nude model and calling it "Cupid and Sea-Nymphs" (60).

The first two works in the catalogue numbers are two very bold sketches by Mr. Sargent, "Palazzo Grimani" and "The Bed of a Torrent," the first a very effective architectural sketch, the second a rapid study of stones in the bed of a stream. As to landscape generally, we have as usual nearly all grades in the reading of landscape, from the realistic handling of Mr. Pilsbury to the blottesque suggestions of Mr. Peterson, whose "Nameless Hills" (123) may well be nameless, inasmuch as they are formless also. This is carrying the revolt against realism to an extreme which defeats its own end. Mr. North's "By Severn Sea" (20) is not nature either; it is a fairy dream of light and colour which exists only in the artist's mind; but it is distinctly made out; we can see what is intended. Mr. Pilsbury, to whose more realistic landscapes we have just referred, does the thing so well and so conscientiously that one is almost persuaded that there is more poetry in his art than appeared at first sight; at any rate he goes on improving, and from his point of view of the treatment of landscape is always satisfactory. Still, this is not all that landscape in water-colour is for. Mr. Robert Little, in "Gateshill" (109), shows us the broader and more poetic way of treating nature, though with a little too much insistence of the artist's own individuality; i.e., it is not so much nature as Mr. Little's view of nature. This does not make it less interesting, but it is slightly one-sided. The perfect balance between truth to nature and the expression of personal feeling is seldom attained in landscape-painting. We find it here in the works of Mr. Eyre Walker more perhaps than in those of any other exhibitor of the present year. His "On the Wye" (43) is a perfectly recognisable scene, it is realistic as far as that goes, but if one wants to recognise the difference between realism with poetic impression and realism without that element, compare it with the Bettwys-Coed picture near it (No. 41), and the contrast is instructive. The latter is a skilfully executed drawing; but it is all finish of execution *et præterea nihil*. "The Valley of the Wye" (155), another of Mr. Eyre Walker's landscapes, is still finer; perhaps the finest in the room; and another remarkable work by the same artist is "Aysgarth Force in Flood, at Night" (146)—remarkable especially in this, that the artist, in portraying a night effect, has resisted the temptation to put in any more detail than could really be seen at night; it gives an actual effect of a roaring torrent just perceptible in the darkness. Usually all so-called moonlight or night effects in landscape are spoiled by inserting more detail and colour than could really be seen under the circumstances. Mr. Colin B. Phillips's two works, "Frosty Day after Storm, Barmouth" (102) and "After Sundown on a June Evening, near Ayrshire" (158), are each a study, as the title implies, of a special effect of light and atmosphere, and both are fine and interesting works, though not equal to the best their author has produced. Of Mr. Cuthbert Rigby's contributions, all good, "The River Rothay" (148) may be specially mentioned for its fine and effective composition. Among others not to be passed over are Sir E. Waterhouse's fine broad painting of "The River Coquet at Warkworth" (60); Mr. Goodwin's "The Last Act and Fall of Curtain, Pompeii, A.D. 79" (29), the most important of his works this year, a scene in the arena during the eruption of Vesuvius—a little too like John Martin over again; Mr. R. W. Allen's bright scene in a Scottish fishing-port—"Home and Rest" (129); Miss Martineau's "A Flowery Path in the Highlands" (164), an excellent piece of landscape composition; Mr. Tom Lloyd's little evening scene, "The Last Wagon" (168); Miss Rose Barton's "Under the Shadow of the Church" (198), a curious experiment, in which the church is only seen in its reflection in the pond; Mr. Eyre Walker's remarkable little bit of composition, "On the Edge of Exmoor" (215); and Mr. Herbert Alexander's "The Picnic" (42), a little picture

made out of a sloping horizon of green hill and a sky above it.

Architectural subjects are tolerably numerous; among these, as usual, Mr. Reginald Barratt is pre-eminent; of his various works perhaps the very best is the "Mill, Volendam" (98), but we much admire also "The Great Church, Dordrecht" (130), with its brick architecture bright in the sunshine. Mr. Goodwin gives a fine view of the theatre ruins at Taormina (256), in which we notice how well the texture of the architecture is conveyed without any hardness or undue emphasis of detail. Mr. Herbert Marshall has contrived to make a fine drawing out of "The Tower Bridge" (37), seen from one of the roads leading up to it, in the only way in which it can be made passable in a picture—viz., by giving the mass only and leaving the details in the obscurity of shadow; he has even omitted (and wisely) the absurd effect of the suspension chains ramping over the top of the approach gateway, as if supported by it; this would have formed the foreground object of his picture, and would have effectively spoiled it. He has a very good little picture, too, of "Notre Dame, Paris" (117), from a point of view from which it has often been painted. Mr. S. H. Hodson's "The Houses of Parliament" (190) is a correct and carefully studied architectural drawing, but hardly a picture in the true sense of the word. Among architectural subjects may be classed Mr. H. Alexander's drawing of "The Horses of St. Marks" (238), perhaps the best study of those famous quadrupeds that we remember to have seen.

Had we space to mention all the works that interested and pleased us, the list would have been a good deal longer. There is no annual exhibition in London where the numerical proportion of really interesting works is so high.

MAGAZINES AND REVIEWS.

The *Art Journal* illustrations are very largely occupied with decorative work. In an article by Mr. Rix on "Modern Decorative Wares" the author admits that all has not been done that might be done with decorative ware in modern times; and he thinks, perhaps rightly, that this failure is in part because too little importance is now attached to its true position as a decorative accessory. "The utmost care and thought are lavished on the architectural details of the home—the metal fittings, hangings, and wall treatments; but the pottery, which should give an accent of colour harmonising with the design and general effect of the surroundings, is often left haphazard to the untutored selection of some wholesale furnisher." A coloured print of some vases produced by Messrs. Doulton shows some fine work as mere colour, or with a decorative surface design which is only just hinted at; and this kind of work represents no doubt one of the functions of ware of this kind—to supply a note of rich colour in a room. Some of the engraved illustrations have the effect—in black and white at all events—of being too strongly marked and pronounced in character. Mr. Harold Rathbone's two plaques in the style of Della Robbia are good in their way, but it is rather archaeological art. An article on "The Liverpool School of Art" shows in its illustrations some clever examples of decorative design. Mr. D. Crol Thomson writes a jubilation on the recent Whistler Exhibition, in respect of which he says (and evidently finds) that "it is not easy to write in temperate language about the acceptance of a great artist amongst the immortals by the majority of the artistic community." If Mr. Thomson lives twenty years he will find that he was too previous in supposing that what art-critics now say about Whistler is the last word. Mr. Thomson is exultant over the unanimity of the daily press; and certainly when art-critics of the daily press of this country do agree their unanimity is wonderful: but then what is it worth? It merely arises from the fact that what is called art-criticism is now the work of a clique who all take the same impulse at the same moment. We declined to join in the general cry, and our impression from conversation with those who do not perhaps call themselves art-critics, but who represent the general opinion of thoughtful people, is that our own view is after all the prevalent one, only few of those who hold it write about art. In the first article in the number Mr. Claude Phillips discusses the question of the authenticity of a "Philip IV." by Velasquez which has been lately purchased for the Fine Art Museum at Boston, U.S.A., and

over which doubts have been raised by some experts in the work of Velasquez. The faith of the Boston owners of the picture is not, however, shaken, and Mr. Phillips confirms them in it as far as he can judge from the photographs supplied, one of which is reproduced.

In the *Burlington Magazine* Mr. F. Lathrop treats of the same subject, and sums up decisively in favour of the authenticity of the picture. In the same number Mr. M. H. Spielmann writes a short and forcible article on the desirability of establishing in this country a Ministry of the Fine Arts, an idea with which we need hardly say that we are entirely in agreement. Mr. Starkie Gardner contributes an article on "Charles II. Silver at Welbeck" in the collection of the Duke of Portland, and most beautiful work it appears to be, from the photographed illustrations. An interesting point is that a good many of these are not solid chased silver, but a silver embossing on a vase or other object made of cheaper material. It is suggested that one reason for this method was not mere economy at the moment, but the fact that such works of art in thin silver were safer, as affording less food for the melting-pot when the court coffers ran low. Mr. Clouston, in his sixth article on "Minor English Furniture Makers of the XVIIIth Century," gives a sketch of the history of Robert and Richard Gillow, the founders of the firm of Gillows, with some illustrations of their original work, and fac-similes of a couple of the crude rough pen sketches in which the designs were made out.

The *Architectural Record* (New York) contains an article on and illustrations of a new building in (or, as the Americans say, "on") Broadway, New York, which is really worth attention. This is the National Park Bank, of which Mr. Donn Barber is the architect, and it is one of the best and most characteristic designs for a bank we have ever seen. It had been a question with the owners whether to find new quarters in a portion of one of the "skyscraper" blocks of offices, or to build their own premises as a separate structure. They decided on the latter, but then it was necessary that the façade should be of such a kind as not to be crushed and over-powered by the adjoining "skyscraper." The architect has solved the problem by treating the main portion of the front as a single great rusticated arch and window between rusticated pavilions, crowned by a powerful cornice; the whole forming the height of three stories of the adjoining building. Above the cornice is an attic treated in a lighter and more graceful style. The interior of the bank is of course unusually lofty (it is roofed by a dome which does not come into the exterior composition), but it is none the worse for that, and the exterior treatment gives exactly the right architectural expression of a bank. The other façade to Fulton-street is equally well treated in the same manner, but in less lofty proportion. It is a building on which we can sincerely congratulate its architect, who has succeeded in showing how a bank may be made bank-like without that employment of a large Order which has been for so long a kind of shibboleth of bank architecture.

The *Berliner Architekturwelt* devotes a photographic view and two plans to the Kaiser Friedrich Museum at Berlin, by Herr Ihne, a building which might well have claimed larger and more numerous illustrations, for it is obviously a very fine work. It stands on a nearly triangular plot, the acute angle of which is rounded off into a large sweeping curve of columns with an arcade between, and a dome behind, over the grand staircase, which is placed in this part of the plan. The axial line of the plan is continued through to another circular staircase hall which forms the central feature of the front on what may be called approximately the base of the triangle, but of the architectural treatment of this front we have no illustration. The plan is very finely arranged, in an architectural sense, and the exterior represents dignified and scholastic classic work. The various illustrations of new street fronts in Berlin present nothing calling for any special remark. A curious coloured plate of a decorative panel by Herr H. Dahmen is given, which consists of an illustration in colour of a rainy street under an avenue of trees in twilight, with lighted tramcars reflected in the wet road; a somewhat easy way of producing an effect. From two other illustrations in black and white it seems that Herr Dahmen's aim is to produce decorative pictures out of ordinary street and house groupings under special conditions of weather.

In *Technics*, Mr. John B. C. Kershaw commences a series of articles which it is intended shall cover the whole of the ground relating to the theory and practice of steam generation. The writer very judiciously qualifies an announcement to this effect by the phrase "so far as limits of space permit." The present instalment is devoted to "The Raw Materials," and deals briefly with the calorific value of different forms of fuel, the quality of water for boiler feed purposes, and the importance of air as a factor in the steam-raising process. In discussing feed water, the writer wisely recommends the separation of impurities outside the boiler, deprecating the use of patent compositions and other chemical reagents in a way which, we may point out, practically involve the utilisation of the boiler as an imperfect form of water-softening apparatus. "Armoured Concrete" is the subject of a short contribution by Lieutenant Harry J. Jones (A.R.C.Sc.Lond.). This is merely an introductory article calling attention in general terms to the advantages offered by the new material, which, as we have before pointed out, should be designated "concrete-steel." Being a compound material, it ought not to be described as if it were a simple material armoured by another simple material. Those of our readers who are interested in electricity will find interesting matter in the articles "On the Electric Conductivity of a Vacuum," by Professor J. A. Fleming; "Boosters," Part III., by Mr. H. Broughton; "The Electro-Magnetic Theory," Part VII., by Mr. E. Edser; and "Electricity from Towns' Refuse," concluded, by Mr. W. P. Adams. As part of a serial on "The Elements of Chemical Engineering," Dr. Grossmann contributes an article with the sub-title "The Mortar and its Technical Equivalents." The writer seems to be taking a very broad interpretation of the expression "chemical engineering," for he discusses in the current issue such machines as stone breakers, ore crushers, disintegrators, grinding mills, and mixing machines. Steam boilers, gas and oil engines, cement kilns, and concrete mixers are also involved in chemical reactions, but it would be very inconvenient to have these and other appliances included in the present series, especially as the writer seems now to have dropped into a style that is purely descriptive, and consequently does not make any demands on the technical knowledge of a chemical expert.

The *World's Work* contains a short account of "The New Transporter Bridge," a type of structure of which several notable examples have been built on the Continent by M. Arnodin. The first bridge of this kind to be erected in Great Britain is one across the Mersey between Runcom and Widnes, described in our issue of October 31, 1903, the second is being built across the River Usk at Newport, Mon. The article is illustrated by photographic views giving an excellent idea of the ingenious principle adopted in structures of the class described. A first article by Mr. S. G. Hobson on "Machine Tool Progress in Great Britain" deserves reading, if only for the refreshing account it gives of the efforts made during recent years by British tool-makers. During the great engineering strike large quantities of the American and German tools were imported into this country, and the notion became prevalent that we were hopelessly behind the times in the design of machine tools. But, as the writer shows, foreign-made products were tried and found wanting. Then, when the result of the strike was that British engineers were freed in some measure from the restrictions formerly imposed by trade unions, our own makers began to introduce labour-saving tools, embodying the best features of foreign types but avoiding their manifest deficiencies. Another article, entitled "The World's Longest Tunnel," gives an outline account of the methods followed and of the difficulties experienced in boring the Simplon tunnel—a gigantic task now successfully completed. Among several illustrations, two are particularly interesting, the first showing the details of the granite arching for the tunnel, and the second representing the manner in which massive timbers and rolled-steel sections were buckled under pressure of the rock. It is worthy of note that concrete was afterwards used for the reinforcement of the steel members with most successful results.

In the *Century* is an article on "The Châteaux of the Loire," by Mr. Whiteing, the author of "No. 5, John's Street" and "The Yellow Van," an odd literary source for an article on old

Châteaux; and the article, as might be expected, is literary and historical rather than archaeological; the illustrations of Luynes, Chenonceaux, and Chinon, are admirable, but then they are not the author's, but are by MM. Jules Guérin and André Castaigne.

An article in *Macmillan* on "Ruskin at Hawarden," by Mr. W. Sinclair, is amusing from the simplicity with which the writer concludes that all Ruskin's sentimental or sometimes querulous letters to the inhabitants of Hawarden, and his *outré* and absurd opinions on everything, are to be matters of serious interest to the reader; and all this, too, at a time when reasonable people are beginning to find out Ruskin, if indeed some of them have not found him out long ago. Among other things the writer impresses on us how greatly Ruskin was devoted to music, and the beautiful things he said about it. Now it is a fact that Ruskin not only did not know good music from bad, but that on a particular occasion at Sir Charles Hallé's he preferred the bad to the good. All this belief in Ruskin's unerring judgments about Art and Life is mere childish sentimentality.

Harper contains a short article on "What Heruleum Offers to Archaeology," by Dr. Waldstein, who has perhaps the best right of any Englishman to speak on the subject. Dr. Waldstein sums up hopefully as to the prospect of the arrangements for the excavation being soon made, and we hope he has not formed too high expectations of the importance of the work which waits to be revealed there; nor do we think so. At all events, the archaeological world ought never to rest till it does know all that can be known. In the same issue is a short scientific account of the N-Jays by Professor Duncan, of Washington and Jefferson College.

In *Scribner*, under "The Field of Art," Mr. Russell Sturgis writes also on Heruleum, with equal enthusiasm but admitting just a hint of possible disappointment. He gives a plan (but without a scale) of the one large villa of which has been partially ransacked, and of which the walls and columns have been approximately planned from measurements taken with difficulty in tunnels. If there are many more houses like this, however, great things are to be expected.

The *Revue Générale* contains an article by M. H. Mainde which may interest many English readers; it is entitled "A Travers le Vieil Oxford," and gives a French visitor's impressions of the University buildings of Oxford. The High-street seems to have impressed him as much as it impressed the German art-critic Dr. Waagen, who said that it had not, as a street, its equal in the whole world. M. Mainde says, on describing his first turning into it:—

"A cette rue on éprouve un peu la sensation qui émeut l'âme du touriste, lorsqu'après avoir parcouru une gorge profonde et resserrée, il arrive tout à coup devant un gigantesque panorama de montagnes, aux contours et aux perspectives grandioses!"

La High Street est la rue la plus majestueusement belle qu'on puisse voir dans le Royaume-Uni. Certain quartier d'Edimbourg donnera peut-être par la noblesse seigneuriale de ses constructions; Chester avec ses magasins et ses maisons bourgeoises à l'aspect médiéval, présentera des applications plus variées et plus étonnantes d'un même type d'architecture, mais nulle part ailleurs, on n'admira une plus grande abondance de styles, déployée avec autant de luxe et d'aisance."

He spoils the famous Latin motto of the University, "Dominus Illuminatio Mea," by inserting a comma after "Dominus," which is not only unnecessary but somewhat modifies the sense. But the article is written in a picturesque style and with much appreciation of the beauty and interest of Oxford from an architectural point of view. With modern buildings the writer does not deal.

In the *Antiquary* Mr. Larkby concludes his article "Notes on Prehistoric Man in West Kent," with further illustrations of flints which he thinks have been artificially worked, but which (as far as one can judge from drawings) we should think very doubtful, except perhaps Fig. 8. Under the title "Sacred Rites in a Shetland Isle," Miss Jessie Saxby contributes a very interesting article on remains of places of worship in the Island of Unst. The Rev. J. B. McGovern continues his article on "The Round Towers of Ireland," containing a summary of different opinions and arguments in regard to their origin, and urges that "if the adherents to the Christian theory would recognise a possible Pagan type, the advocates of this latter would concede the undoubted Christian source of several, the ruins of which still stud the uplands and lowlands of Ireland."

We confess it appears to us that one must take them all together, as Pagan or Christian; but it is hardly likely that there will ever be any certainty on the subject.

UNSOLVED PROBLEMS IN ELECTRICAL ENGINEERING.

THE "James Forrest" lecture by Colonel Crompton at the Institution of Civil Engineers on Monday night was listened to with the greatest interest by a crowded meeting. Although hardly any of the problems discussed by the lecturer were novel to the electrician, yet the clear *résumé* he made of the partial solutions that have been attained and of the many difficulties that have still to be overcome was very suggestive. He regarded the problems from the point of view of the manufacturer and the engineer rather than from the standpoint of the scientist, and although this possibly makes his lecture less interesting, it makes it more immediately useful. He began by discussing some of the difficulties which have arisen in connection with the effects produced by lightning discharges in underground electric mains. Some electricians were sceptical about these effects, but he had seen cables which had broken down because they were perforated with minute holes, which were, in his opinion, due to sparks caused by impulsive rushes of electricity, induced in the mains during thunderstorms. Overhead wires can be protected efficiently by modern lightning arresters, but the present methods of protecting underground mains are inadequate, and this problem will have to be solved immediately. In our opinion, however, it presents no particular difficulty to the electrician. Companies transmitting power by high tension mains partly overhead and partly underground are by no means uncommon, and the difficulties arising from impulsive rushes during thunderstorms have been met by spark dischargers, or "coherer" arresters of the Thury type. It would be possible to make any system of underground mains almost absolutely safe from lightning discharges by means of suitably-designed electrical "safety valves." The real problem is to find out the number of "safety valves" to be provided.

In connexion with wireless telegraphy Colonel Crompton pointed out how enormously the present methods of transmitting signals could be improved if a continuous discharge could be invented. It was found in practical work on board ship that the noise made by the sparks between the terminals of the transmitter was very objectionable. Dr. Fleming had very recently overcome this difficulty by letting the sparks take place in carbonic acid gas under pressure. Tesla's suggestions as to the etheric transmission of power are also regarded as feasible. If they should ever be realised, the conditions of our life would be revolutionised.

The difficulties in obtaining steel castings free from blow-holes and porosity were mentioned. It is found that a slight alloy of silicon makes the metal much more fusible; so that the castings obtained are quite regular. It is also stated that the losses due to hysteresis and eddy currents are diminished. As the methods of testing for hysteresis loss are extremely difficult, and the formulae for eddy current losses in magnetic metal have not yet been found, we fail to see how manufacturers can arrive at this conclusion.

Colonel Crompton stated that the method of winding dynamo coils by wires insulated by means of cotton, silk, or spiral paper strip was gradually being abandoned. The winding of the field coils of dynamos was also merely of copper strip wound round material insulated with a suitable fibrous material. He was strongly in favour of using paper strip for winding coils. Considerable economy of space could be attained by this means and of space could be constructed so that the heat the coils could be conducted away. The experiments were rapidly radiated away. The experiments carried out for the Standards Committee by the National Physical Laboratory proved that the maximum temperature inside a coil as the maximum temperature was often 40° F. in excess of ordinarily wound was determined in the mean temperature determined in the ordinary way by measuring the resistance of the coil. It was therefore not only to radiate the heat away, but also to use insulating materials capable of withstanding very high temperatures. Such materials, he believed, could be found.

He showed a coil the insulation of which had

and subjected to a very high temperature without appreciable deterioration.

We did not quite follow the lecturer's remarks about the advantage of being able to run machinery at high temperatures. Are we to understand that an ordinary ten-kilowatt dynamo, for instance, if suitably constructed with heat-resisting insulating material, could be run as a fifteen-kilowatt machine, the gain being a much cheaper machine and the loss a diminished efficiency? Although Colonel Crompton adopts views which are widely prevalent, yet many of the foremost electricians regard this desire on the part of manufacturers to run their machines at temperatures above that of boiling water with considerable misgiving. Our own practical experience of heat "resisting" insulating materials has been disappointing. A stationary apparatus, like a transformer, can often stand overheating for a year or two, but the insulation gets brittle and a slight shock or an attempt to move it leads to disaster.

Colonel Crompton is firmly convinced that electric traction can supersede steam. He thinks, however, that the competition of electrical engineers will spur the engine builders to greater exertions and that steam locomotives capable of hauling a train at one hundred miles an hour will soon be designed. He was struck by the fact that American electricians are of opinion that goods traffic cannot yet be handled economically by electricity.

For part of the time of the lecture the room was illuminated by the Cooper-Hewitt mercury vapor lamp. Although the light produced by this lamp is an ideal light for reading or working by, yet, as it contains no red rays at all, it is very objectionable, as it makes everyone look deadly pale. The room was also illuminated with two "flame" arc lamps giving a light rich in orange rays. This light was very trying to the eye and, as the lecturer stated, it was quite unsuitable for indoor purposes, although most useful for street illumination. Colonel Crompton mentioned with approbation the osmium lamp of Auer von Welsbach and the tantalum lamp, but these lamps are not yet on the market. Nernst lamps of high candle-power were shown. In conclusion, the rapid development of power distribution schemes in this country was welcomed. There would soon be no necessity for workmen to congregate in towns so as to be near the factory. Each would be able to work in his own country cottage, and the improved physical environment would lead to the welfare of the race.

THE ARCHITECTURAL ASSOCIATION.

A special general meeting of this Association was held on Friday, last week, at No. 18, Tufton-street, Westminster. Mr. E. Guy Dawber, President, in the chair, when the Committee's proposal to substitute "Council" for "Committee" wherever it occurs in the Constitution or by-laws was agreed to unanimously.

The ordinary general meeting was then held, when Mr. A. H. Raymont, Cricklewood, was elected a member, and Mr. Reginald Blomfield, A.R.A., was elected by acclamation. The President said they would all be glad to welcome Mr. Blomfield among them. Mr. Blomfield was an authority on education, and he (the speaker) was quite sure he would help the Association.

Building Fund.

The President also announced the reinstatement of Messrs. C. B. Bone, F. A. Whitwell, and F. A. Nash. He also announced the following additional donations to the Building Fund:—

	£ s.	£ s.
J. H. Square (further donation) . . .	5 5	C. Rene Harrison . . . 1 1
Prich. Stannus (further donation) . . .	5 5	Leslie T. Moore . . . 1 1
Cherry. H. A. P. (further donation) . . .	8 8	Sundry small donations . . . 1 1

The President stated that 3,000% is still required, less 1,000% kindly promised by a generous donor, and he hoped the money would soon be obtained.

Mr. Louis Ambler, Hon. Sec., proposed a vote of thanks to Mr. H. Tanner, jun., for showing a party of members to visit the Shipping Office, Cockspur-street, on Saturday, March 25, also to Sir H. Tanner for allowing members to visit the new Government offices, Parliament-street, on the same date. This having been agreed to, he also announced that the annual dinner would be held at the Criterion Restaurant on Thursday, May 18, at 7 for 7.30.

Officers for Next Session.

A vote of thanks having been accorded to Mr. W. D. Caroe for presenting to the Association seventy-three lantern slides.

The President called upon the scrutineers for their report on the election of officers for session 1905-06.

The report having been handed to the President, he announced that 479 voting papers had been received, of which 23 had been rejected as invalid. The result of the voting was as follows:—

President, Mr. E. Guy Dawber. Vice-Presidents, Mr. John Murray, 317 votes, and Mr. Louis Ambler, 303 votes.

Committee: Messrs. R. S. Balfour, 361; E. Needham Wilson, 358; A. Hart, 356; Arnold Mitchell, 311; J. S. Gibson, 296; W. A. Pite, 282; J. McLaren Ross, 277; E. A. Rickards, 266; J. B. Fulton, 264; and Maurice E. Webb, 212.

Hon. Treasurer, Mr. Francis Hooper; Hon. Librarian, Mr. W. A. S. Pettit.

Hon. Secretaries, Messrs. H. Tanner, jun., and A. Maryon Watson.

Hon. Solicitor, Mr. W. H. Jamieson; Hon. Assistant Librarians, Messrs. E. Gunn and C. M. Crickmer.

On the motion of the Chairman, a vote of thanks was accorded to the scrutineers, *i.e.*, Messrs. J. W. Denington, M. S. Hack, W. I. Travers, and T. W. Watkins, for their services in counting the voting-papers, etc.

The Chairman said it was his pleasing but sad duty to propose a hearty vote of thanks to those members of Committee who had not been elected, but who served on the last Committee. He would couple with that the names of Mr. Driver, Secretary, and his staff for their excellent work on behalf of the Association.

Thanks were also accorded to the School of Design. Visitors, who had been unremitting in their attention during the session, and to whom the Association owe a deep debt of gratitude for their criticisms and help; and the Press for their reports of the proceedings of the Association.

The Buildings of the World's Fair at St. Louis.

Mr. H. Phillips Fletcher then delivered a lecture, illustrated by a large number of lantern views, on "The Buildings of the World's Fair at St. Louis, 1904." He said:—

MR. PRESIDENT AND GENTLEMEN—

The "World's Fair" held at St. Louis last year commemorated the centenary of the purchase of the Louisiana Territory by the United States Government from France.

This territory contained over 1,000,000 square miles, and forms the central portion of the present United States.

The Mississippi River formed the eastern boundary between the Louisiana Territory and the United States, and was the great highway upon which the extensive lumber trade of the Americans was carried to the port of New Orleans.

In 1800 this port had been secretly retroceded from Spain to France, and two years later, when the fact was announced, great alarm was caused in the States on account of the strained relations with France. Moreover, Spanish officials still lingered at the port, and were a great cause of annoyance to the Americans.

In 1803, Jefferson, the then President of the United States, sent Commissioners to Napoleon the Great to see if terms could be arranged for the purchase of the city and Island of New Orleans. Napoleon, apparently being in great need of money to carry out his expansive ideas in Europe, conceived the idea of bartering the whole of the Louisiana Territory for much-needed gold. The business capabilities of the little Corsican proved quite equal to dealing with the astute Yankee, and, after various negotiations, he succeeded in squeezing fifteen million dollars out of the pockets of the American citizens.

This, the greatest deal in real estate ever negotiated, more than doubled the area of the original States, which, as defined by the Peace Treaty of 1783, contained less than one-third of the present area of this great Republic.

At the time of the purchase there were many who opposed it, but the wisdom of the venture has been more than justified since by reason of its great mineral wealth and agricultural resources.

The Site.

The site chosen for the Exhibition included a considerable portion of what is known as the Forest Park; and some idea of its character can be gleaned from the view on the screen,

which represents the same partially cleared in readiness for the preliminary engineering works. After the plans had been considerably advanced it was found that more land was necessary, and the Exhibition authorities obtained a lease of the Washington University (then in course of erection), together with the grounds containing 110 acres belonging thereto.

The General Plan.

A piece of land known as the "Catlin Tract" was added at a later date, for the owners, knowing that it was indispensable, set a stiff price upon its sale, which the Exhibition authorities had to submit to. During the Exhibition this portion was known as the "Pike," and the Amusements concessions were situated thereon.

The total area occupied by the exhibition was over 1,240 acres, being greater than the combined areas of the Chicago, the Buffalo, and the last Paris Exhibition. About one-fifth of the whole area was roofed in.

The main scheme of the plan somewhat resembled an open fan, and was originated by a Committee of some seventeen architects who were partners in nine prominent American firms. The plan proved to be scarcely comprehensive enough, as the Exhibition assumed much greater proportions than were anticipated.

It will be seen that the instructions to the Commission were inadequate. The consequence was that the Exhibition was to some extent marred by the fact that there were really several separate schemes for the buildings. It would perhaps have been better if some scheme had been devised which would have admitted of expansion. This would have prevented some irritation to visitors, as it involved the separation of more or less allied subjects which wasted one's physical energy in searching for.

The central feature of the picture was the Festival Hall, which was situated on the crest of a hill. Restaurant Pavilions on either side were architecturally connected to the Festival Hall by the Colonnade of States. At the foot of the hill was the Grand Basin, into which three series of cascades discharged 90,000 gallons of water per minute.

Three main avenues radiated from the hill and afforded vistas terminating with the highly decorative features of the Festival Hall, the Colonnade of States, and Restaurant Pavilions. These avenues were crossed by a Grand Transverse Avenue, which thus gave the general outline to eight of the main Exhibit Buildings.

This Transverse Avenue was to have had a semicircular sweep, but the extra cost it would have entailed in erecting all the buildings with curved façades was prohibitive. As planned, four of the buildings had a break in one or two of their façades which was cleverly disguised in three of them, *viz.*, in the Education, Manufactures, and the Varied Industries Pavilions.

On either side of the Grand Basin were series of lagoons two miles in length, which surrounded two of the great exhibit buildings and were spanned at intervals by tastefully-designed bridges. Well executed statuary was placed in the main avenues.

The other main exhibit buildings, the Administration Buildings, and the Foreign Concessions, were situated westwards of these, while the States' Buildings occupied the south-eastern corner of the grounds.

An Intramural Electric Railway, 13 miles in length with seventeen stations, skirted the grounds and served a considerable number of the exhibits, though it missed some of the more important buildings.

After the general plan of the "Fair" had been decided upon, the civil engineer commenced his topographical survey of the ground. It was first marked out in 1,000-ft. squares, and was later subdivided into 50-ft. squares, readings being taken at the intersections and at such additional points as governed the contour.

Maps were prepared to a scale of 50 ft. to the inch, and monthly progress maps showed at a glance the advancement made in the erection of the works.

Engineering.

The engineering works and building construction involved by this Exhibition were extensive. In preparing the site for the buildings some 2,000,000 cubic yds. of earth were moved.

To facilitate the construction and the housing of the exhibits, fifteen miles of temporary track had to be laid through the grounds, in

addition to extensive storage tracks in the south-western part of the grounds.

Burnt ballast, gravel, macadam, asphalt, and brick were the materials used in the road-making. Oak was used in the kerbing throughout, 10 in. by 3 in. in thickness being the scantlings employed.

An adequate water supply was provided from the mains of the city of St. Louis. Quite a network of pipes, varying from 2 in. to 12 in. in diameter, and 21 miles in length, was laid down over the entire grounds and inside of the buildings.

In addition to this there were about 30 miles of pipes installed for high-pressure fire protection, and each State, foreign, and concession building, had to connect its own system of pipe to the Exposition mains.

There were 530 high-pressure hydrants and 31 deck turrets for the protection of the main Exhibit Buildings. There were also five fully equipped fire-engine stations, and a double company of Hale's Fire Fighters from Kansas City.

The pipes for the high-pressure system for roofs and the inside and outside of buildings were of wrought iron, tested to withstand a pressure of 750 lb. per sq. in., and a pressure of 150 lb. was maintained by means of fourteen 1,000-gallon fire-pumps.

Other means of fire protection were provided in sprinkler systems and numerous chemical fire extinguishers placed at convenient points in each building.

The River "Des Peres" pursued a somewhat tortuous course through that part of the grounds upon which the main exhibit buildings were to be erected, and it therefore had to be diverted and the old river bed filled in. A timber flume, 45 ft. wide by 15 ft. deep, was constructed for this purpose.

For the drainage of the grounds, in addition to the waterway of the harnessed "Des Peres," 25 miles of storm water drains were constructed and ample provision was made for the reception of the water outside the grounds, so as to prevent damage from the overflow.

For the main sewerage scheme the Exhibition authorities laid down 12 miles of 8-in. vitrified pipe sewers and about 1½ miles of brick sewers.

These discharged by gravity into two wells near the Mines Building, from which the sewerage was pumped into the sewer mains of the city by four electrically-driven centrifugal pumps.

In addition to this main sewerage scheme there was the system installed for the Washington University Buildings in the north-western corner of the grounds, a few stray sewers laid by speculative builders of real estate plots, and the pipes laid by the various States and the Foreign Governments and concessions.

The bridges were constructed on a standard plan. This consisted of a simple arch system of 3-in. by 14-in. timbers for the top and bottom chords, and a solid web of two courses of 2-in. by 12-in. planking. At the centre, where the head room for passing boats, etc., did not allow of the use of this truss, 3-in. by 16-in. joists were substituted, and were skillfully connected to the main trusses.

The boiler-house was of fireproof construction, and was situated close to the Machinery Building. The steam mains from the boilers were conveyed through a tunnel to the Machinery Building.

A garbage crematory was erected in the western portion of the grounds.

Construction of Restaurant Pavilion.

The Division of Works had entire control over the construction of the main exhibit buildings. A new departure was made in constructing these of timber in lieu of steel, by reason of which a great saving in cost was effected.

Ample opportunities were afforded to the architect of studying this the greatest example of the art of carpentry ever executed, since most of the construction was visible internally, owing to lack of funds to complete the plastering.

The Director of Works stated that only forty draughtsmen were employed to prepare the drawings for the Exhibition Buildings. The designing and erection of the same occupied only some two and a half years.

The foundations of these buildings varied according to the nature of the ground, spread footings, timber cribbing, or piles being used. Some idea of the timber framing, such as was

employed in one of these huge structures, is shown in the view now on the screen, which is the skeleton of one of the restaurant pavilions.

Long leaf yellow pine was used for all posts, roof trusses, and framing. The safe tensile strain was taken at 1,800 lb. per sq. in., the safe compression perpendicular to the grain 800 lb. per sq. in., and the safe shearing stress parallel to the grain 150 lb. per sq. in. In the white oak keys the safe stress parallel to the grain was taken at 400 lb. per sq. in.

The walls of the main exhibit buildings, which were 2 ft. in thickness, consisted of timber framing. The timber columns were so constructed as to approximate conveniently to the finished design. Steel and wood lathing were used to carry the "staff."

The "staff" was generally composed of 2 parts of plaster of Paris and 1 of Portland cement, to which Manila or jute fibre was added, and these were mixed together with water till in a plastic state.

This composition was then either applied direct to the laths or expanded steel sheets, or was cast into moulds, and when thoroughly dry, nailed to the framed walls. When cast it could be sawn or planed in the same way as wood. It is alleged to withstand the weather if painted.

The white oak keys of circular cross-section were used throughout the construction in the following cases:

- (1) To make the shear connexions between the individual posts of built-up columns (which were subject to direct compression and bending strain).
- (2) To make all tension splices of jointed timbers break joint wherever they occurred.
- (3) To make all attachments to posts and trusses where a force parallel to these members had to be transmitted to them.

These keys, which were 2 in. in diameter, were driven into holes bored after the individual timbers had been bolted together. When the keys were all in position the bolts were tightened up. The advantage of circular keys is evident from the great saving of expense by their adoption, as but little labour is necessary; they are also speedily fixed in position, and the certainty of uniformity in their fit was certain since the holes were bored with augers operated by compressed air. The disadvantage in practice was found to be that when the timbers shrank these keys could not be tightened up, and in some cases they fell out and did some damage to exhibits beneath. Life and limb being held so cheaply in the States one must not stop to enumerate the accidents that occurred to the mere public therefrom.

Square keys used as folding wedges are undoubtedly superior, since they can be tightened up; and moreover, the pressure of the shearing strain does not develop a component laterally, as with the round keys. Doubtless, therefore, the former would have been adopted if the buildings had been required for any considerable length of time.

Roof Truss (Transportation Building).

The roof trusses employed were mostly of the familiar Howe type, the span of these varying with the requirements of the different buildings. The main columns measured 14 in. by 3 ft. 8 in. on plan, and were composed of two posts 10 in. by 14 in., and one post 8 in. by 14 in., with two sets of packing pieces, 8 in. by 14 in., between. The columns supporting some of the smaller roof trusses were composed of two posts, 12 in. by 14 in., with one set of packing pieces of similar scantling between them. Numerous oak keys, as already described, were employed in transmitting the stresses which these columns were subject to from post to post.

In an exhibition, if skilfully contrived, columns internally should not interfere with the exhibit spaces.

The roofs were mostly flat, except where architectural effect necessitated them being otherwise, and composition roofing was the chief covering used.

The buildings were intended to be finished internally in plaster, but lack of funds prohibited this being fully carried out, which was fortunate from the point of view of an architect desirous of studying the construction. The main exhibit buildings were chiefly lighted by means of sky-lights, clerestories, and lanterns, or "monitors," as the latter are called in the States.

The Commission of Architects fixed a uniform cornice level of 60 ft. above the adopted ground level for the Main Buildings. This cornice level was, therefore, about equal to the height of the two orders to the Banqueting House, Whitehall, and may give some idea of the scale employed.

The earlier plans suggested galleries, but the authorities in charge of the exhibits department deemed them undesirable, since very few would be likely to visit anything above the ground floor level of such stupendous buildings.

Festival Hall, etc.

Having thus dealt with the general structural features of the main buildings, we will rapidly consider a few of the principal buildings.

The Festival Hall was designed by Mr. Cass Gilbert, of New York, in front of his permanent Art Building, the latter being completely screened off by the Festival Hall and Colonnade of States.

It was a large circular building, 195 ft. in diameter, with a rectangular annex containing the stage, organ, accessory dressing-rooms, and offices. The auditorium was covered by a dome, the internal diameter of which was 90 ft.

A gallery was provided, and there were promenades on both this and the ground floor. Seating accommodation was provided for 3,500, tip-up seats being generally employed in the auditorium and the first four rows of the gallery, while in the remaining rows ordinary chairs were used.

This building was highly decorative externally. Engaged Ionic columns were employed in the circular colonnade, which stood upon a lofty podium. The great entrance, with its curved pediment and crowning sculptured groups, was at once very ornate and imposing. Unfortunately, the great statue of Liberty, raising the veil of Ignorance and protecting Truth and Justice, which was placed above the central cascade, completely obliterated it from view when standing on the Plaza of St. Louis.

The crowning feature of the building was the dome, which rested on a lofty drum of considerably less diameter than the circular colonnade. Bull's-eye openings were introduced at the junction of the dome with its drum.

Originally it was intended to place a statue figure upon the dome, but in execution this was varied to a figure of Victory.

The cost of this building was about \$3,000,000.

Colonnade of States and Restaurant Pavilions.

The Colonnade of States, designed by Mr. E. L. Masqueray, was an ornamental screen, 52 ft. in height and 1,500 ft. in length. It was formed of a succession of fourteen hemicycles, in which were placed statues symbolical of the States and Territories included in the Louisiana purchase. Ionic columns were used in pairs, and swags were suspended between the capitals. These had a somewhat detached appearance as seen against the sky.

The Restaurant Pavilions, which were placed at each extremity of the Colonnade of States, were extremely festive in design. Mr. Masqueray was responsible for these also.

From most parts of the grounds these pavilions and the Colonnade appeared to be somewhat too disconnected.

Cascades and Gardens.

The borders of flowers were tastefully arranged, and changed with the seasons. These cascade gardens, perhaps, attracted more attention than any other decorative feature of the Exhibition. At night the cascades were illuminated by means of three sets of incandescent lamps, which changed ever and anon from white to red and green.

Art Buildings.

The Art Buildings made a majestic architectural group on the hill behind the Festival Hall and Colonnade of States, and consisted of four distinct buildings, three of which presented a total northern frontage of 830 ft. The central building is of fireproof construction, and remains as a permanent public picture gallery, being a lasting monument to the Exhibition. It is 340 ft. long and 160 ft. wide, and contains a large central hall for sculpture, with galleries on either side for pictures and other works of art. During the Festival period the Main Building was occupied by exhibits from the United States.

As already mentioned, it did not form a part of the main picture of the Exhibition. The reason given was that this building is of buff

brick, which did not harmonise well with the ivory white staff of the Exposition buildings. The temporary structures, each measuring 422 ft. by 200 ft., on either side of the permanent building were to some extent fire-resisting.

The Ionic order was employed in these buildings, and the portico of lofty Corinthian columns to the central building accentuated the main entrance.

The fourth building was a pavilion, 200 ft. by 100 ft. on plan, for sculpture by masters of international reputation, and was situated on the fourth side of a court formed by the three art buildings already mentioned.

The cost of the entire group was over 210,000*l*.

U.S. Government Building.

The building erected to house the United States Government exhibits stood on high ground at the eastern end of the Grand Transverse Avenue. It was approached by three great flights of steps, in addition to which gentle inclines led to the terrace level. The main façade was some 750 ft. in length, and the central entrance portico, with its coupled Ionic columns, was connected to end pavilions by a colonnade of Ionic columns 45 ft. high and 5 ft. in diameter. Above the main cornice level an attic 15 ft. in height was introduced, and it will be noticed that, in the case of the central portico, the pediment was placed above this attic, thus giving importance to the main entrance. A low dome, 93 ft. in diameter, was a prominent feature of the roof, and in general character it suggested that of the Pantheon, Rome, as the motif.

The general design of the building had a wealth of treatment and purity of detail in keeping with its purpose, and excellent opportunities were afforded for sculptured ornament.

This building was the only instance in which the roof was carried by steel trusses, 175 ft. in span, at intervals of 35 ft.

The architect was Mr. James Knox Taylor, supervising architect of the Treasury Department, and the cost was some 73,000*l*.

Main Exhibit Buildings.

We now come to the main exhibit buildings. I have already mentioned that the general scheme was decided upon by a Commission of architects representing nine firms, and that of these firms was entrusted with the design of one of these vast palaces. We have also noted that the Division of Works designed the construction and controlled the erection of the same buildings. Thus the architects were responsible only for the elevations, an altogether unsatisfactory state of affairs, which can only lead to the alienation of the two factors of our accepted definition of architecture: "Design and Beauty and Build in Truth."

Mines Building.

Commencing at the eastern end of the Grand Transverse Avenue and proceeding westwards, we first notice the Mines and Metallurgical Building on our left and the Liberal Arts Building on our right. The Mines and Metallurgical Building, measuring 525 ft. by 750 ft., was designed by Mr. Theodore C. Link, of St. Louis. The great overhanging roof was a distinguishing feature, the eaves projecting rather more than 15 ft. beyond the face of the loggia. The plan in the loggia had capitals of an Ionic type, while the columns upon the screen walls were of a Byzantine origin. The screen walls were filled with sculptured panels representing various branches of mining and metallurgy.

Two of the central entrances—those on the north and west sides—were surmounted by a globe 30 ft. in height, which was supported by colossal figures, 28 ft. high, and surrounded by other finely modelled groups of even larger size. Great obelisks, 140 ft. in height, flanked these entrances, but unfortunately were placed too close to the building, having the appearance of being jammed up against it. Moreover, they hid the sculptured groups and globes from most points of view.

These obelisks were intended to symbolise the greatest mining (quarrying) feat of antiquity performed by the Egyptians thousands of years before the Christian era. The cost of this structure was about 110,000*l*.

Liberal Arts Building.

The Liberal Arts Building was entrusted to Messrs. Barnett, Haynes & Barnett, of St. Louis, and was of the same dimensions as the Mines Building just described. It was alleged

to be designed in the French Renaissance style, and the treatment was described as being somewhat severe.

The main façade to the Grand Transverse Avenue had a colonnade of coupled columns of the Roman Doric order. The principal entrance, in which the Corinthian order was employed, was in the centre of this façade, and was taken considerably above the main roof in rather an abrupt manner. Similar entrances occurred towards the extremities of this front, and semi-circular pavilions, crowned with domes, were introduced at the corners of the building.

Education Building.

The Education Building, designed by Messrs. Eames & Young, of St. Louis, was situated next to the Mines Building, and was entirely surrounded by lagoons, which contributed largely to its effect. Its position rendered it one of the most conspicuous buildings in the main picture. On plan it was the shape of a key-stone to an arch, and covered an area of about 9 acres. The Corinthian order was employed in the colonnades, the giant columns being 50 ft. in height.

The main entrances, which were placed in the centre of each façade, resembled somewhat the well-known form of the triumphal arch, and were surmounted with finely modelled quadrigas.

The break in the façade to the Grand Transverse Avenue was very successfully treated in a simple manner by slightly projecting the main entrance. The cost was about 75,000*l*.

Manufactures Building.

The Manufactures Building, by Messrs. Carrère & Hastings, of New York, faced the Education Building on the opposite side of the Grand Transverse Avenue. It covered an area of about 14 acres. The northern and southern façades had breaks in them, the former having an entrance resembling a great triumphal arch, and the latter a deeply recessed arched opening which interrupted the lines on either side of the break. The corner entrances were skilfully contrived, and were surmounted with flat Roman cupolas. This building was raised on a stylobate of steps, and the Corinthian order was employed in the façades. The northern and southern fronts had arcades, the columns being placed in pairs to the piers between the arcades. The crown of the latter was close to the cornice, which ran continuously round the building. This structure cost about 144,000*l*, being a greater sum than was spent upon any other main exhibit building.

Electricity Building.

The Electricity Building was similar on plan to the Education Building, and also occupied about 9 acres. It was designed by Messrs. Walker & Kimball, of Boston and Omaha. It was situated on the other side of the Grand Basin from the Education Building, and, like the latter, was surrounded by lagoons. The Corinthian order was employed externally in all the façades, the columns resting directly on the ground. Had these been raised upon a stylobate of steps there would have been a gain in dignity to the building. The raised pediments over the central entrances and the low towers at the angles of the structure accentuated the façades. The treatment of the break in the northern façade was not a happy one, since, the entrance being recessed, the awkwardness of this undesirable feature was emphasised. The cost of this building was some 85,000*l*.

Varied Industries Building.

The Varied Industries Building was designed by Messrs. Van Brunt & Howe, of Kansas City. It was situated on the opposite side of the Grand Transverse Avenue to the Electricity Building, and covered an area of similar shape and size (14 acres) to the Manufactures Building. The Ionic order, standing on a lofty rusticated base pierced by arched openings, was employed throughout in the façades. This building had breaks in its northern and southern fronts, each of which were successfully treated. That to the north front was disguised by a circular colonnade, while that to the south front had a free-standing colonnade which curved outwards in front of it.

Domes were placed over the central entrances to the north and south fronts; while the central entrance to the eastern front was elaborated, having large coupled Ionic columns surmounted by a triangular pediment. Twin belvedere turrets, with conical roofs, flanked this entrance.

The cost of the structure was about 142,000*l*, the second most costly building erected by the Division of Works.

I might mention here that the four buildings last described, namely, the Educational, Liberal Arts, Electricity, and Varied Industries Buildings, were provided with internal courts, but owing to the demand for more exhibit space these were roofed over to a great extent, the Electricity Building suffering least in this respect.

Machinery Building.

The Machinery Building was designed by Messrs. Widmann, Walsh, & Boisselier. It was situated to the west of the Electricity Building in a position corresponding to the Mines Building, and its main dimensions were 1,000 ft. by 525 ft. The northern façade had an arcade of seven arches as the central feature, above each extremity of which rose lofty towers in three stages. The remainder of the façade had an arcaded treatment, the Corinthian order being used, and the corner pavilions were accentuated by towers of similar design to those at the main entrance, but without the middle stage. These towers, while well proportioned in themselves, appeared out of scale with the design. The cost of the structure without the sculpture was some 110,000*l*.

Transportation Building.

The Transportation Building was designed by Mr. E. L. Masqueray. It was situated opposite the Machinery Building in the Grand Transverse Avenue, and occupied an area of over 15 acres. The eastern and western façades had an arcade of three great arches, which formed a distinguishing feature. These arches were to have been repeated in the centre of the long façades, but were omitted in execution. Simple but well-proportioned three-light windows were ranged along the northern and southern façades, at the extremities of which appeared a single arch of similar design to those in the eastern and western façades.

Sculpture was sparingly used, the architect depending more upon proportion and mass effects for the success of the design. The cost of the structure was close upon 138,000*l*.

Agriculture Building.

The Agriculture Building was allotted to Mr. Isaac S. Taylor, the Director of Works, to design. It was 1,600 ft. long and 500 ft. wide, and was situated quite apart from the main scheme and westwards of it. It was divided into nine aisles, with eight rows of columns, which supported the roof trusses. The centre span was 105 ft., and it would have been better if the remainder of the width of the building had been roofed in four spans instead of eight.

As it was, when viewed from the side there appeared quite a forest of timber columns, which were somewhat confusing. However, the plan was simple, and could be readily divided into exhibit spaces, while the lighting was irreproachable.

There were five main entrances to this building, one in each of the northern, eastern, and southern façades, and two in the western façade. These were each 52 ft. wide and 74 ft. high, and consisted of a great arched opening, the upper part of which was glazed. Around these openings was concentrated the ornament, and each was flanked by square piers, surmounted with decorative flagstaffs. Along the eastern and western façades were ranged piers at intervals of 100 ft., and practically the whole of the wall space between these was occupied by windows. This building was the largest in the grounds, yet its cost was only 110,000*l*.

Interior of Horticulture Building.

The Horticulture Building, which was located south of the Agriculture Building, was still another by Mr. E. L. Masqueray, and the design was very simple. The main entrance projected boldly, and the doorway was a large square-headed opening. It consisted of central portion, 380 ft. square, and eastern and western wings, each 205 ft. by 235 ft. These wings were divided off from the central block by glazed partitions, the eastern one being used as a conservatory.

The view on the screen shows the interior of the central block. The framing and roof trusses, which are visible, are typical of most of the main Exhibit Buildings. The cost of this building was rather more than 51,000*l*.

Forestry, Fish, and Game Building.

The Forestry, Fish, and Game Building

was yet another which was designed by Mr. Masqueray. It was situated to the north of the Agricultural Building, and was the smallest of the main exhibit buildings, being only 600 ft. long by 300 ft. wide. The exterior was simple and unpretentious, yet designed in good taste, and the general effect was pleasing.

The long façades were terminated by simple gables, and "pent" roofs were supported on brackets above the windows to these fronts. The eastern and western fronts had central gables with triangular-headed groups of windows, which latter feature occurred in the gables to the northern and southern fronts.

Administration Building: University Hall.

The Washington University Buildings, with the grounds as already mentioned, were leased to the Exhibition authorities for the period of the "Fair." There are eleven buildings altogether, which are built in what we are told is the Tudor Gothic style, and four of the buildings are arranged round a quadrangle. The materials employed are red Missouri granite and cut stone dressings. The principal building is the University Hall, which was utilised for administrative purposes. The central entrance is under a massive square tower, with octagonal towers at each of its angles, which are continued above the battlemented parapet as turrets. The entrance is roofed with a large groined vault in stone. The entire building is of fire-proof construction, and cost about £2,000. The other buildings of the University were utilised for various purposes, the Division of Works being accommodated in one, while another was used for the Anthropological exhibit.

Washington State Building.

The Washington State Building was a unique structure, specially designed to demonstrate in its construction the vast lumber resources of the State. The great timbers, which have the appearance of raking shores, were over 90 ft. in length, with a scantling of 24 in. by 28 in. These supported all the floors of this five-story building. The interior was finished in the finer grained woods produced by the State.

Foreign Buildings: Japanese Pavilion.

As might be expected, Japan fully established her claim to be recognised as a competitor to European nations, and secured some of the best sites on the grounds. The Japanese exhibits were both varied and extensive, and went a long way to show the resourcefulness of the land of the chrysanthemum. The Mikado's Pavilion will at once be recognised as a typical Japanese structure.

French Pavilion.

The Grand Trianon at Versailles, which was designed by Mansard, was reproduced at the Exhibition for the French Government Building. Unfortunately, the columns, which were intended to represent the marble of the original, were badly painted, and entirely spoilt the effect.

German Pavilion.

The Castle at Charlottenburg was taken as the motif for the German Pavilion, but the most that can be said about the latter is that it was given an appearance of age by toning the "staff."

British Pavilion.

The Royal British Pavilion, like the French and German Pavilions, was designed after a typical English building. The Orangery of the Palace at Kensington was adopted as the motif, and the architects, Messrs. Ernest George & Yeates, are to be congratulated on their work. The building was erected by Messrs. Trollope, and was constructed of Portland cement on metal lathing. It was undoubtedly the best built pavilion on the grounds, and was purchased by the authorities of Washington University as a students' club-house.

The British Commissioner, Col. Watson, R.E., C.B., C.M.G., was quartered here, and it was due to his energy and enterprise that the British section was the only one in complete readiness on the opening day.

An old English formal garden was laid out near the British pavilion. This was a marked success, and created a great deal of interest and admiration. The portion in the art buildings occupied by the British Section approached the ideal of what an art exhibition should be. All the pictures were clearly labelled with the subject and name of the artist, which thus rendered a continual and worrying reference to the catalogue unnecessary.

The Hon. Secretary of the Art Committee,

Mr. J. Spielmann, worked unceasingly for the success of the British Section, and it was largely due to his instrumentality that Great Britain took the foremost place in the fine and applied arts sections. The British Commission was fortunate in securing the assistance of Mr. R. Hunt and Mr. A. A. Longden in these sections, and the admirable way in which they conducted their departments at the Exhibition was an object lesson to the foreign countries in the Fine and Applied Arts Building.

We have reason to feel proud of the Motherland, for the British exhibits were well to the fore in most of the sections. British firms were awarded the following by the juries: 121 grands prix, 238 gold medals, 162 silver medals, 132 bronze medals, making a total of 653 medals in all. This is somewhat encouraging, and speaks more eloquently than words as to the vitality of British craftsmanship.

"The Pike."

Before concluding, a few words might be said about the Amusements Concession. This was known as "The Pike," and was a street about a mile long. Here many interesting side-shows were located, as well as exhibits of practical value, among which might be mentioned the Fire Fighters referred to in the early part of this lecture.

Among other buildings there was a reproduction of Battle Abbey, while the Irish Village, the Tyrolean Alps, the Hagenbeck's Zoo, Creation and a host of other shows crowded this well patronised section of the Exhibition.

Conclusion.

The record which the Great Exhibition holds of being the largest in the world's history is likely to remain unchallenged. Financially it was a failure, and it is most improbable that any community will invest money in such an undertaking in the future.

Few who visited the Exhibition had anything like sufficient time at their disposal to see it entirely. Great bodily strength and endurance were essential to those who hoped to visit all the buildings, of which there were over five hundred on the grounds. Many of these were exhibitions in themselves. Anyone who wished to see all the exhibits in the Agricultural Building was in for a walk of over ten miles!

Evidences of fatigue were frequent, the ambulance being kept busily employed. The glare of the ivory white of the great buildings was most trying to the eyes, and boys did a busy trade selling smoked glasses.

The Exhibition in itself was typical of the American nation; everything savoured of their desire to create something that was the "largest on earth." And this all-absorbing striving after magnitude resulted in the neglect of many details and in the general want of harmony that prevailed, and it would appear that the principles of Tammany Hall were not always confined to the great city of New York.

Nevertheless, one is bound to admit that from an educational point of view the Exhibition was a great success. It must be remembered that it was situated in the centre of a vast country devoted to Agriculture and the extraction of mineral wealth, and that the principal people who passed through the gates were mechanics and farmers. The Exhibition was of such a character as to bring home to these classes not only the latest inventions in machinery and electricity which they would otherwise have been unable to observe, but the ideas and products of each nation could be studied side by side. And as one saw the intelligent farmers and their families day after day coming in trainloads to see this "World's Fair," and as one watched them thronging the huge Agricultural Building, one could not but feel that at least this Exhibition was educating just those to whom it would be of the most practical value.

It occurs to one that the sturdy men of the Western States will form the backbone and steady influence of the American nation in the future. They are the true yeoman of the Republic, and each tills his own land for his own uses, and sells the surplus, which is the ideal method of agriculture.

One is apt to look upon Americans generally as being of a nervous, excitable temperament, and this to some extent holds true with regard to the true Yankee of the New England States; but the inhabitants of the West have that solidarity of character that will help in the future to weld together the extremely diversified attributes of this cosmopolitan race, and will, we hope, do something to divert that which seems to be the pending catastrophe, viz.,

civil war between capital and labour, engendered by the formation of the enormous and apparently unscrupulous Trusts.

In the discussion which followed, Colonel C. M. Watson, R.E., C.B., C.M.G., Commissioner-General for Great Britain, who was called upon by the Chairman, said he had great pleasure in proposing a very hearty vote of thanks to Mr. Fletcher for his admirable lecture. Mr. Fletcher's slides and descriptions brought back to him many happy days which he passed at the Exhibition, and of days which were given up to work, for organising an exhibition and looking after it meant work—more perhaps, than many people could understand. On the present occasion they were considering the architectural side of the Exhibition, and he agreed very thoroughly with Mr. Fletcher's remarks on the various buildings; but Mr. Fletcher had not alluded to one of the effects of the Exhibition—one of the best effects—i.e., when the shades of night fell upon the Exhibition, and the buildings were lit up most beautifully with the electric light. It was quite a fairy scene, especially the cascades and the Colonnade of States and the Festival Hall and the Education and Electricity Buildings. It was one of the features of the Exhibition which one could never forget, and in some respects the night view was more satisfactory than the day view, because with many of the buildings one felt that the exterior had been designed by one person and the interior by another; and in architectural work, in order to gain a really good result, the interior should be designed first. The result was that many of the buildings, however beautiful the exterior, were not altogether satisfactory from an exhibition point of view. The lighting left much to be desired—in some places it was not enough and in others it was a great deal too much. Of course, in a town like St. Louis, situated where the sun was very hot in summer, the question of lighting had to be specially considered, and the lighting of some of the Exhibition buildings was excessive—in fact, many of the exhibitors put awnings over the exhibits to prevent them being damaged by the sun. But there was one building, designed by Mr. Masqueray (of whom he was glad to hear Mr. Fletcher speak so well, for he was one of the best of the Exhibition architects)—the Agriculture Building, which was not so remarkable outside, perhaps, but which, inside certainly was excellent from an exhibition point of view. The interior view from the northern view. The interior view, and, though one entrance was magnificent (it was 1,700 ft. of the largest of the buildings (it was 1,700 ft. in length), it was from an exhibition point of view, one of the best, the light was good through out, and it was less obstructed by wooden columns and girders than the other buildings. The view across it was not so effective, and he thought it might have been improved had there been fewer wooden columns and had the girders been longer, but, generally speaking, the building was an admirable one. In that building, for some reason or other, people did not suffer as they did in other buildings from the oak pegs falling out. Certainly it would have been better had some other mode been adopted of fastening the timber, for the result of the method employed was a danger, and some of the exhibits were seriously damaged by two oak pegs falling out. It would have been better had screw bolts been used, or some other means found of fastening the timber than these wooden pegs, which were dangerous to the exhibits and the passers-by; an oak peg weighing some pounds could be anything else when falling some 80 ft. Mr. Fletcher had made some kind remarks about the British Royal Pavilion and its garden. That garden was the most peaceful spots in the whole Exhibition, and it was very pleasing to see women and children, and it was very pleasing to see women and children who had become tired by wandering about over the great distances they had heard about coming into the British garden to rest upon the seats—many of them English flowers who were glad to see again the English flowers growing in the English way. Many of the British garden, and at first it was decided to prohibit lunching in the British garden, but they could not do it when they found how much the people enjoyed the quiet of the place. The exhibition of Queen Victoria's Jubilee presents was certainly one of the most successful exhibits of the whole show; more than a million people came to see them, of whom the vast majority knew very little about the presents; they saw those presents; but afterwards they knew a great deal about England. Another

feature of the British Section which gave great interest was the little group of constables from Scotland Yard, whose civility surprised the people.

Mr. A. A. Longden, of the British Commission, who seconded the vote of thanks, referred to the skillful way in which the garden architects had tackled the enormous banks of mud which faced one everywhere at the beginning of the exhibition, and into which one continually sank to one's knees. In two months it was transformed into quite tolerable landscape by putting in small trees and shrubs by the thousand, planting Indian corn and numerous other quick-growing specimens. The Exhibition did an enormous amount of good to the people out met, and from an artistic point of view it was also highly appreciated. A picture dealer in St. Louis told him that he had sold more works from the end of the Exhibition to the beginning of January than he had in any three months previously, thus showing that the American people are willing and able to appreciate things artistic if only they are enabled to see them thoroughly.

Mr. A. O. Collard, who supported the vote of thanks, said that one reason why the St. Louis Exhibition scheme was rather scattered was that inadequate instructions were given by those who spent the money. They thought they would rather start with a comparatively small scheme than launch out on a larger one and be unable to fill the buildings, and that, no doubt, was why the scheme was developed in the way they saw. Mr. Fletcher used the word "fireproof" in his paper, though he had not actually spoken it that evening, and in his address he spoke of "fire-resisting" materials. The word fireproof was not used now in connexion with buildings. Even in the Building Act the phrase "fire-resisting" was used instead. Mr. Fletcher also spoke of "lumber," which was a cumbersome word, instead of timber, and it seemed to be a fact that Englishmen who went to America brought back American words, which, however, were off in time. As to the interior of the buildings of the Exhibition being left unfinished owing to lack of funds, he thought it was a good thing that it was so from the architect's point of view, for it was better to show the construction of such temporary buildings. It must have been a fine sight to have been at the Exhibition and seen the whole of this construction, and it was pleasing to see the timber construction from the slides; and the sense of space which was felt would have been lost had the buildings been lined inside with plaster, as was proposed. It had occurred to some architects whether they were going in the right direction in covering the wood and steel construction of exhibition buildings in plaster. Some of them thought that the Exhibition of 1891, when Paxton's idea of a noble exhibitory building was put into execution, had started on the right lines, and that since then we had been getting farther and farther away from the right kind of building for public exhibitions. As to "staff," which was what we knew as fibrous plaster, Mr. Fletcher had not, apparently, a good opinion of it. He (the speaker) had used the material a great deal, and in his opinion it was the best substance for enclosing a temporary building, provided it was beyond the reach of human beings who might kick it or put sticks or umbrellas through it. He had used fibrous plaster at Earl's Court, and some they had used in 1895 was as good now as when it was first put up. The material, however, where the weather gets at it, needs to be painted every year, and if that were done there was no reason why it should not last as long as any ordinary building material. One wondered, however, what was the "fibre" and in the composition of the material at St. Louis. A Belgium firm he had employed used chopped up hay, about a foot in length, and the plaster was as good to-day as when first put up. As to plasterers, the English plasterer used to give a lot of trouble, and whether that was the case in America or not Mr. Fletcher did not say. At Earl's Court it had been possible to get the plaster work finished only by employing foreign as well as English plasterers, and at one time they had nearly 1,000 plasterers at work there in 1895, or the work could never have been finished for the opening. He was sorry to say it, but in his experience the Belgium plasterers were the quickest to grasp ideas, the quickest at their work, and the cheapest to employ at that time, though matters have improved since in

the English trade. Mr. Fletcher did not say if the plaster at the St. Louis Exhibition was painted, but he supposed it was, unless it was disintegrated. At Earl's Court the plaster was painted. Where money was an object, painted canvas could be used for these temporary buildings, and he was rather surprised that the Americans had not tried this. The scenic artist was so clever nowadays, and as plaster was a sham, why not, in the interests of economy, have a little more sham and use canvas instead of plaster, and paint it? The delightful practice of using wood was not permitted in England in these buildings on account of the supposed risk of an outbreak of fire; in America, every possible means was provided of putting out a fire if one occurred. Mr. Fletcher had mentioned the total cost of the various Exhibition buildings, and most Englishmen would think that cost very great, but he would be interested to know how much per foot cube they cost. In that connexion, he might mention the foot cube cost of the Empress Theatre at Earl's Court. He had asked people what they thought the cost per foot cube of that building was, and they had replied from 4d. to 6d. Including all the seating for from seven to 10,000 people, all the machinery, two blocks of dressing rooms for 1,000 performers, etc., the cost worked out at 2d. per foot cube. The cost of most ordinary exhibition buildings varied from 3d. up to about 3d. per foot cube. The question of medals had been mentioned, and he was wondering whether the St. Louis Exhibition people sinned against the public as did most exhibition authorities. They usually grant an enormous number of medals, but the unfortunate exhibitor could not have them unless he paid for them.

Colonel Watson: It was laid down in the regulations that no medals would be issued except bronze medals, and that issue was free; the grant of a diploma carried with it a free bronze medal. If an exhibitor had a gold medal he had it at his own expense. Medals of different character for each class of award were to be issued, so as to insure that a bronze medal should not be gilded over to look like the gold medal.

Mr. Collard: St. Louis Exhibition was not different, then, in that respect from other exhibitions. When a gold medal was awarded it ought to be given. But in this case it was a question of expense; the Exhibition did not pay, and that was a great pity. The cost of administration must have been enormous, and crippled the Exhibition financially.

Mr. Banister F. Fletcher said the point that would occur to most of them was the place the Exhibition took in comparison with other and past exhibitions. The Paris Exhibition, fifteen years ago, was a very different one from the St. Louis Exhibition, and especially in the matter of architectural design. The Parisians, for the first time—if one omitted Paxton's great building—seemed to regard their exhibition of 1889 as an opportunity for doing some really quite novel things in design, and at a great deal of expense and loss they produced quite a novel type of architecture. They took iron and terra-cotta, and most of the big buildings at the Exhibition—the Fine Arts Palace and the Liberal Arts Palace—were formed entirely of steel or iron framing riveted together with interstices of buff terra-cotta. That was in Paris—the home, as might be said, of Roman art in its modern form, and there they found this great attempt at something novel. That was a great thing to do, but it seemed to have died a natural death, and neither at Chicago or at St. Louis was anything novel in the way of architectural design attempted. That was a great pity, seeing that these buildings were temporary. They were designed to serve a temporary purpose, and yet the main idea of the American architects seemed to have been to make these temporary buildings look as permanent as possible. The orders of architecture had been introduced on an enormous scale, and the buildings to all intents looked like great marble palaces. It was a question whether it was an advisable form of design to adopt, or whether it would not have been more in keeping with exhibition design if something temporary in appearance had been done. The steel method of building adopted in Paris was much more expensive, but still it seemed that something might have been done in the way of evolving a timber architecture. The bones of the St. Louis Exhibition buildings were of timber, and if some ingenuity had been shown in evolving a timber type of architecture—showing

what the buildings were really made of—it would have been more interesting to architects, at all events. The use of "staff" was an easy way of making a permanent-looking building. While at the Paris Exhibition of 1889 he went into the question of the composition of "staff," and his report was in the Institute Library. Of the ability and the success of the architects of the United States in the buildings they had erected for the Exhibition there could be no doubt, and he did not suppose that in any other city of the world would one see such a great architectural effort on such a magnificent scale. The Chicago Exhibition, where he spent six weeks, must have been quite an insignificant affair in comparison with the St. Louis Exhibition, and yet the Chicago Exhibition was about twice as big as the Paris Exhibition.

The Chairman then put the vote of thanks to the meeting, and it was heartily agreed to.

Mr. Phillips Fletcher, in reply, said he endorsed what had been said about the illumination of the buildings at night, and as to what Mr. Longden had said, he agreed as to the very successful way in which the Fine Arts Section was carried on. He had lectured on the subject of the St. Louis Exhibition at the Royal Institute of British Architects, and in his present address he had tried not to repeat himself, and in answer to some of the points raised he would refer Mr. Collard to the lecture he gave before the Institute. As Mr. Collard said, the buildings of the Exhibition grew beyond the limits of the original scheme, which was just his (the speaker's) point; a scheme ought to have been prepared which would have been capable of proper expansion. He had a great objection to the use of the word "fireproof," which latter was a printer's error for "fire-resisting" in his paper. With Mr. Collard, he was glad the Exhibition buildings were not finished off internally in plaster, as was intended. As to strikes, there were 200 of various kinds at St. Louis Exhibition, and no doubt there were strikes of plasterers among them. He did not agree with Mr. Collard as to English plasterers. A few years ago the plasterers' trade was in a bad state, but to-day many of the English plasterers turned out good work. As to the use of canvas instead of plaster, he would draw Mr. Collard's attention to the flammability of it; plaster was fire-resisting, but canvas was not. In his report on the St. Louis Exhibition there was a table of the cost of the buildings per foot cube. In one or two cases the Americans had been a little cheaper than Mr. Collard at Earl's Court. His (the speaker's) brother had touched on a point he made in his paper read before the Institute of Architects. It seemed to him that the American architects had a great chance of infusing new life into their work by treating the buildings frankly as temporary buildings, and every one had failed to take advantage of it except, perhaps, the architect of the Washington State building. He knew that the great difficulty would have been the scale, and to have treated anything in half-timbered work in that way was, perhaps, not practicable, but he wished that something had been attempted. The inventive genius of the Americans had failed in this respect.

The Chairman said that this was the last meeting of the session, and the proceedings then terminated.

CONTRACTORS' DEPOSITS.—During the hearing of the case at the Central Criminal Court, when Henry Corbett Jones, solicitor, ex-town clerk of Holborn, pleaded guilty, before Mr. Justice Jelf, to stealing cheques for 2,000l. and 9,000l., belonging to the Holborn Borough Council, Mr. Muir, for the prosecution, said that some of the amounts that had been misappropriated had reference to the payments by contractors as compensation for alleged damage done in connection with certain works; other sums referred to contractors' deposits in respect of tenders. The learned counsel was proceeding to explain the system of contractors' deposits of 20l. when Mr. Justice Jelf (interposing) asked who started the system and how long it had been in existence.—Mr. Muir: I am told, my lord, it dates from time immemorial. The judge said he regarded this system of contractors' deposits as being full of dangers and temptations. For a contractor to make a deposit in order to get the same advantage as another was, in his opinion, an insidious form of dishonesty.—Mr. Muir: I hope your observations, my lord, will be taken notice of by all the metropolitan boroughs.—The judge: I regard the system as rank bribery.

THE ARCHITECTURAL ASSOCIATION
SPRING VISITS.

VI.—**ZOLIAN HALL, NEW BOND-STREET, AND
NO. 2, HAMILTON-PLACE, W.**

The interest of the sixth spring visit of the current session, held on Saturday the 8th inst., was between an important work of modern commercial enterprise and a new West-end house. At the former building, the members of the Architectural Association made a complete inspection of the recently-reconstructed premises of the Orchestral Company of New York, known as the Zolian Hall, and the courtesy of the management in arranging for the visit was much appreciated.

The process of altering and adapting the well-known Grosvenor Galleries to the purposes of the business, and of fulfilling County Council regulations in respect of the concert hall, has been one of much difficulty; and it was unanimously agreed that the architect, Mr. Walter Cave, had not only successfully accomplished all this, but had produced a work of high artistic value.

The front portion of the site, formerly occupied by Nos. 135, 136, and 137, New Bond-street, but now used as the entrance-hall and offices of the Company, is the property of the Corporation of London, and is leased upon peculiar terms. The rear part, belonging to the Westminster estate, accommodates the concert hall and show-rooms, formerly used as picture galleries.

In providing the spacious entrance, two petty walls on the ground floor had to be cut away and it is indeed refreshing to find that, in addition to some iron stanchions, the verde antique marble columns which are important details in the decorative scheme perform acts of support to a considerable extent. As a precaution, these marble monoliths were carefully tested before fixing, and each column carries at least 90 tons. The offices for manager, cashier, and clerical staff are cleverly arranged in convenient and inter-accessible positions.

A feature of very great interest to all architects should here be recalled. It is not generally known that the stone and marble ground story of the New Bond-street front is an actual work of Palladio, brought from a church in Venice some years ago by Sir Coutts Lindsay. With the exception of some slight restoration and the carved keystone in the doorway, the whole appears to be genuinely original.

Just inside the interior of the building is panelled and fitted up in oak very much in character with XVIIIth century decoration. In the concert hall, which seats 400 people, the panelling is about 8 ft. high in mahogany, relieved with various forms of inlay, and the whole is stained with ammonia to a most pleasing and subtle dark tone. The upper parts of the walls are finished in plaster, in which a number of niches on the east and new windows on the west side are now introduced. The old top light is, therefore, discontinued, a new ceiling hiding the original skylight has been inserted, and the intervening space used for the heating and ventilating of the hall. The stage, semicircular in form, contains a large organ; oak is here used in all the wood construction and decoration to comply with the regulations pertaining to a music licence.

Under the concert hall and at the ground floor level a very large store-room is fitted up as a library for the 450,000 rolls of "Pianola" music. On the floor below is space reserved for music-boxes, the repairing and polishing of instruments and the despatch of goods, while lifts of various forms and sizes are in use in connection with these departments. Still further down there is a sub-basement, utilised for storing large packing-cases and for heating purposes. It is considerably below sewer level and is liable to flooding from rains and from the course of the old Tyburn brook, which still runs hereabouts at a low level. A pump worked by a gas-engine is therefore kept constantly at work.

Throughout the premises a pleasing, yet restrained, feeling is seen in the decoration. Special attention has been given to the design of electric light fittings, which are the work of Mr. Bainbridge Reynolds. The design of the lacquer-covered doors and of the furniture and fittings, for which the architect is responsible, is excellent; indeed, taken as a whole, no more meritorious subject for study could have been selected, and the presence of Mr. Cave, who gave exhaustive explanations of all the intricacies of the work, enhanced the success of the occasion.

No. 2, Hamilton-place, Park-lane, a house in course of rebuilding, was then visited, but the state of the work gave little opportunity of seeing more than bare construction. Scaffolding, however, had been removed, and enabled the members to view the front and back elevations. Although window-frames were absent, the Portland stone exteriors have many elements of an unsatisfactory nature; but, in justice to the architects, Messrs. Romaine-Walker & Besant, it should be pointed out that the Crown, from whom the lease is obtained, required that the general features and main lines of the fronts should follow those of No. 5, Hamilton-place. The same restriction was imposed upon Nos. 3 and 4, which have recently been rebuilt.

As we pointed out in our issue of April 1, this desire for uniformity is a commendable effort upon the part of this governing authority, but again the conditions did not admit of practical accomplishment. Apart from the fact of its being at a considerably higher level, the "example" has proportions and grouping totally different from the three fronts which have been made to sympathise with it. The resulting confusion and loss of rigour are characteristics which otherwise would not have been excused.

The house has a straightforward plan, and the interior has promise of dignity. The working departments in the basement, of which the kitchen is located below the garden, are simply and conveniently contrived. It is estimated that the house will cost when complete 46,000*l.*; a little of this outlay could be saved, and the house gain much in artistic value, if paint were omitted from the task window-frames and casements.

THE ARCHITECTURAL ASSOCIATION
DISCUSSION SECTION.

At the eleventh meeting of the session of the Discussion Section of the Architectural Association, held on the 29th ult., Mr. K. Gammell, A.R.B.A., read a paper on "The Planning of Buildings and the Safety of the Public." The subject was taken under the following heads or types:—Buildings used for Secular purposes, for Religious purposes, for both purposes, Stores, Restaurants, and Reception-rooms.

Under the first group came theatres, concert halls, town halls, churches and chapels of various denominations, many plans of which, specially prepared for the occasion, were shown on the screen to illustrate the points in the paper. Large scale diagrams showing suggested modifications or improvements in the arrangement of the seating, corridors, stairs, exits, etc., were also displayed and referred to. The staircases from galleries were, in particular, dealt with, and the necessity for keeping them entirely separate from other parts of the same building was emphasised. Some of the plans shown were incredibly bad; yet it is to be feared they were not very exceptional or exaggerated instances: halls and places of worship from which, in the event of panic, the chances of escape without disaster were somewhat remote, to say the least, seemed to be the rule rather than the exception. Exit doors leading on to a balcony with no means of descent therefrom ought not to be permitted. The balcony became a trap, and such an arrangement is known to have added considerably to the death roll in the Chicago theatre fire. A warning note on "stores" was sounded. Such places of business and resort have, as often as not, grown by the adding of shop to shop of more or less out-of-date construction and plan, altered or added to as necessity demanded, and full of highly inflammable goods, and, during the busy seasons of the year, crowded with people in their hundreds or thousands. In such "stores" lifts for passengers and for goods may usually be found, thus adding yet more to the danger from the rapid spread of fire. Such stores, as well as restaurants and hotels, not having music licences, did not come under the regulations of the London County Council, and were, therefore, free of much-needed restraint.

Of matters in detail: a 1½-in. hydrant, with a length of hose-pipe, ought in all cases to be provided in addition to hand-buckets, which latter are often, as in the case of a certain London theatre, out of reach of anyone under average height, so far as being able to get at the bucket without losing half its contents was concerned. No light or flimsy seats should be permitted in any hall or place where the public gather, and all seats should

be securely fixed to the floor. Exit doors should open both ways. All angles in exit passages should be rounded and the corners filled up to shoulder height; and no unnecessary spaces which are likely to encourage the practice of standing to watch a performance should be allowed. Exit stairs should be in direct alignment with exit corridor; no refreshment or other room to open directly off a main exit corridor. In theatres the use of a permanent hanging valance to upper part of proscenium opening should be abolished and the opening made of the proper size. In his opinion it would be quite possible to treat the wall space above it architecturally. Again, the ceiling ventilator, towards which draughts and flames are inevitably drawn in the event of fire, might, with much increase of comfort and safety to those in the upper parts of the house, be placed nearer the proscenium arch, away from the centre of the auditorium without necessarily jeopardising artistic effect. He took exception to some of the so-called automatic bolts in use to-day, which were automatic only in name, also to the illuminated type of exit notice in use in some London theatres.

A much sounder way of indicating an exit was by the judicious placing of lights in the passages, as shown in the diagrams on the screen, and similar to the method adopted on some railways of indicating the name of the station by hanging a flat glass plate, with name painted on, in front of the platform lamps; the reason for this being that exit notices were often not illuminated, whereas the lights in exit passages must be kept alight if the exit was to be of use.

At the conclusion of Mr. Gammell's paper a communication from Mr. W. E. Riley, the Superintending Architect to the London County Council, who was unable to be present, was read. Mr. Riley emphasised the need for attention to the safety of the public in stores and hotels. The disaster at the Hotel Windsor in 1899 was an instance of what might not improbably happen again. There the walls were to a large extent lined with boarding with cavities behind, and the inflammable gases generated by heat spread all over the building, and, suddenly becoming ignited, involved the whole fabric at the same time. Open balcony staircases were valuable adjuncts when constructed of incombustible material, and when approached from balconies through fire-resisting and self-closing doors such staircases could not easily become smoke logged. The provisions of the Factory and Workshop Act in this connexion were well worthy of perusal. The disguising of doors other than exit doors was to be commended; it had been well done in some of the more recent theatres. It did not, Mr. Riley thought, detract from the architectural treatment as it emphasised the more important doors. As regards slopes in lieu of steps, these should undoubtedly be provided where only one or two steps were involved, and, if the site would permit, it would be conducive to safety if steps and stairs could be abolished altogether in public places.

The discussion was opened by Mr. R. H. Weymouth and continued by Messrs W. Paul, J. H. Pearson, Gilbert H. Lovegrove, W. Wonnacott, A. H. Belcher, Stanley Towse, Louis Ambler, and Mr. H. Gregory Collins (the Chairman).

In summing up the discussion, Mr. John Murray, the Special Visitor, said that panic had rightly been emphasised as a greater danger than fire, but that even with the most elaborate provisions and regulations, unless there was a proper and efficient system of supervision, little practical good would result. The difficulties of dealing effectively with existing buildings—some of which were much in need of remodelling—were very great, and improvements could only be effected gradually. Mr. Murray detailed an instance which had come under his notice as regards the rapid spread of fire, and where the flames had followed the paint on the joinery, and had, with the aid of draughts, travelled from the ground floor to the upper rooms without seriously damaging the woodwork. The affinity of fire for paint was here evident, and he pointed to the desirability of using a fire-resisting paint. He did not altogether agree with the views expressed in regard to panic bolts; there was certainly room for improvement in the patterns at present available, but a panic bolt needed regular inspection, and this, he was afraid, it did not always get. Slippery steps and pavements were to be avoided—marble and the artificial stones were to be avoided on this account. Short of

To provide for the maintenance of the open space provided in accordance with the provisions of the Act at all times of the year.

To provide that open spaces behind houses shall be larger than the present Act requires.

To provide that sufficient open space shall be provided to allow of the means of access to the inspection chambers required under the Public Health Acts, for the purpose of disconnecting the drain from the sewer being placed outside the building.

To require that courts for providing light and air shall be provided in the centre or interior of new buildings exceeding 150 ft. in depth.

To amend the provisions relating to courts for admitting light and air to domestic buildings so as—
(a) To make a minimum provision for the ventilation to a court enclosure on every side.
(b) To make it clear that the window referred to in the provisions is intended to be a window provided to comply with the rules as to habitable rooms.

To omit from section 45 of the Act of 1894 the provision that a court of which the greater dimension does not exceed twice the less dimension shall be held to comply with the section if a court of the same area but square in shape would comply therewith.

To reduce the depth allowed for a court open on one side and to make the rules as to windows to habitable rooms apply to any window to a habitable room, including a room in a basement.

To limit the height of walls in which there are any windows which are required to be provided by the rules as to habitable rooms, opposite to any land or building which is or is intended to be in a different occupation.

To make the provisions relating to courts for admitting light and air to "domestic buildings" apply to offices and counting-houses.

To make provision with regard to a window placed obliquely in a court or recessed.

To prohibit, except under certain conditions, the erection in ways laid out for foot traffic only of dwellings of a greater height than the width of the way.

To provide that in new streets no building shall exceed in height the distance between buildings on opposite sides of the streets.

To make the provisions as to the height of buildings in streets of a less width than 50 ft. apply to streets formed before 1862 as well as to those formed subsequently.

To prohibit the erection, and to control the height, of buildings (other than domestic buildings) within specified distances of buildings of the domestic class.

To require that all staircases shall be adequately lighted.

To make the minimum height of habitable rooms (as wholly or partly in the roof) 8 ft. 6 in. instead of 8 ft. 6 in. as at present.

To provide that the minimum space that shall be left between the ground and the underside of the floor shall be 6 in., and to require the provision of openings for ventilation the minimum size of such openings to be 2 in. by 6 in.

To provide that a habitable room constructed over a stable, coach-house, or harness-room communicating therewith, shall be separated horizontally and vertically from the stable by a solid concrete floor or partition, finished smooth upon the surface, properly supported, and of a minimum thickness of 6 in.

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supply, to Mr. Byron Hunt, Messrs. Shelbourne & Co., ironwork to partitions and dolphins, to Messrs. Edwards & Co., Limited; ironwork in straps, etc., to Messrs. Rubery & Co.; bolts, nuts, etc., to Messrs. D. Wilkes, Limited; castings, to Messrs. Edle & Co.

That the repairs and alterations at the following places, Cherry-gardens, Globe, Thames-tunnel, Surrey Commercial Docks, West India Docks, and Greenwich, be carried out by the Works Committee as a jobbing work, and that expenditure not exceeding 8,000l. be authorised for the purpose.

Manor Asylum: Laundry, Bakery, etc.—It was agreed that, subject to the passing of the annual maintenance estimates, and to the approval of the necessary plans by the Home Secretary, expenditure of a sum not exceeding 1,610l. for the enlargement of the main kitchen, the bakery, and the laundry at the Manor Asylum, be sanctioned.

Tramways: Position of Mains.—The following recommendation of the Highways Committee was agreed to:—

That expenditure, on capital account, not exceeding 25,000l. be sanctioned in connection with the removal, lowering, or diversion of mains, pipes, wires, etc., necessary in connexion with the reconstruction of the tramways from Westminster-bridge and St. George's-circus to North-street, Wandsworth, together with the lines in Falcon-road; that the Highways Committee be authorised to make arrangements with the Metropolitan Water Board and the several companies concerned to carry out the work at the cost of the Council; and that the seal of the Council be affixed to any contracts or other documents which may be deemed necessary in connexion with the matter.

The Proposed County Hall.—There was on view in the members' lobby a water-colour drawing of the proposed new County Hall and Administrative Buildings, which the Establishments Committee recommended should be erected on the Embankment almost opposite the House of Parliament, and in the Council chamber itself were hung large cartoons showing the ground plan and the contiguous sites. During the afternoon the following details, prepared by Mr. W. E. Riley, the superintending architect, were circulated. The consideration of the proposal stands over until the next meeting of the Council, in accordance with the by-law to the effect that seven clear days' notice must be given of any expenditure involving a sum of over 5,000l.:

A perspective drawing has been hastily prepared showing the possibility of a dignified architectural treatment of the river facade. Both the sketch and the cartoon plans are intended to be merely indicative of the capabilities of the site in relation to the immediate surroundings, and are not intended as other than sketch schemes, which would be considerably modified as a more matured plan is formulated. As shown on the drawings, the lower Embankment could be made accessible to the public, thus continuing the treatment in front of St. Thomas's Hospital, and thereby adding architectural dignity to the river frontage, whilst the terrace at the higher level is intended for the use of members only, and would be approached from the reception, committee, and other such rooms.

The whole of the administrative offices, comprising the above rooms, council-chamber, lobbies, committee-rooms, members'-rooms, chairmen's-rooms, lady members'-rooms, and additional rooms adjoining thereto, could be arranged on the principal floor, the offices being accessible from an entrance in an inner quadrangle approached by a carriage-drive from Belvedere-road, which will be widened to at least 50 ft. Minor entrances for the public and staff could be provided on the Belvedere-road and Westminster Bridge approach, and by this arrangement ready access would be obtained to all parts of the building, and thereby avoid the congestion of the traffic which might possibly occur with entrances on one front only.

The river at this point runs nearly due north, and the site being approximately parallel with the river, three important facades would be respectively on the south, east, and west aspects; the maximum of sunlight would thus be obtained throughout.

In the middle portion of the river facade might be placed the council-chamber and committee-rooms, which could be grouped around a central feature, and, in this position, would be subject to a minimum of the external disturbing influences of traffic and noise.

To improve vehicular approach, and also the lighting of the lower floors on the east frontage, the width of Belvedere-road will be widened. The leading frontages will be 800 ft. to the river, to the bridge approach 240 ft. and to Belvedere-road 760 ft. It will be seen that access is obtained on three sides of the proposed building, and an important improvement initiated on the side of the river; for the purpose of comparison, the frontage of Somerset House is about 550 ft.

On the basis of 150 super. ft. for each officer, the building will accommodate 2,580 officers, and allows 61,790 sq. ft. for storage accommodation; the present number of officers is 1,365.

The approximate estimated cost of the building, foundations, and embellishment, as indicated in the sketches above described, is 1,100,000l.

A flight of steps at present exists on the south-west corner of the site, and it would appear to be necessary to provide public access to the river at that point. The effect of this on the plan would require to be carefully considered hereafter.

The aim would be in maturing such a scheme architecturally to treat the exterior of the building in a simple and dignified manner, to exclude all useless ornament, and to depend more on the proportion of the masses to attain dignity and fitness in the appearance of the building.

This would probably be best answered by constructing the whole of the external facades in Portland stone. It would add to the appearance and beauty of the position to plant such trees and shrubs on the lower terrace as the exigencies of the traffic would permit.

Trafalgar-square.—Sir Melville Beachcroft moved that Trafalgar-square stands much in need of improvement, and might at a very moderate cost be made as attractive as a place of public resort occupying so important and central a position in London ought to be, and that it be referred to the Parks Committee to consider and report what, if any, proposal could properly be made on the subject to the First Commissioner of Works. He thought that the present time, when the new street was being brought into the square, offered them a good opportunity for going to the Government and asking for leave to adorn the square by providing seats and laying out flower-beds and parterres.

Mr. Stuart Sankey seconded the motion. The motion was rejected by 37 votes to 25. The Council soon after adjourned.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Strand.—Two iron and glass shelters to a proposed extension to the Flower Market, Covent Garden, to abut upon Wellington-street and Russell-street (Messrs. Lander, Bedells, & Crompton for His Grace the Duke of Bedford, K.G.).—Consent.

Hackney, Central.—Buildings upon a site abutting upon the western side of Chatham-place and southern side of Belsham-street. Hackney (Messrs. Hodson & Whitehead for Messrs. Hodson & Rowlandson).—Consent.

Lewisham.—Two houses, with one-story shops in front, upon the site of No. 117, Rushey-green, Lewisham (Messrs. Norfolk & Prior for Mr. S. S. Brush).—Consent.

Lewisham.—Three houses, with one-story shops in front, upon the site of No. 119, and part of the site of No. 117, Rushey-green, Lewisham (Mr. A. W. Osborn for Mr. H. F. Page).—Consent.

Hampstead.—Six buildings upon a site abutting upon the south-western side of Finchley-road and northern side of Lymington-road, Hampstead (Mr. W. A. Rabson for Mr. W. F. Cave).—Consent.

Marylebone, West.—Enclosures to a porch at No. 7, Mandeville-place, St. Marylebone (Mr. F. Cornelius-Wheeler).—Consent.

Width of Way.

Wandsworth.—Five houses on the northern side of Blackshaw-road, Tooting, eastward of Maybury-street (Mr. W. Wright for Mr. S. Blaker).—Consent.

Wandsworth.—A deviation from the plans sanctioned for the former laying out of a new road of the west side of High-street, Putney, next No. 104, so far as relates to the formation of the mews and the erection of a one-story stable at the end of the cart-hed (Mr. F. J. Brewer for Messrs. Spencer, Santo, & Co., and Mrs. M. Maxwell).—Consent.

Camberwell, North.—Buildings upon a site abutting upon the north side of Canal-bank and east side of Canal-street, Camberwell (Mr. R. A. Jack for Messrs. Findlater, Mackie, & Todd).—Consent.

St. George-in-the-East.—Buildings on the northern side of Brewhouse-lane, Wapping (Messrs. Cheston & Perkins for the Governors of Bridewell Hospital and Messrs. Taylor Brothers).—Consent.

Width of Way and Lines of Frontage.

Brixton.—A one-story shop on the northern side of Station-road, Brixton, westward of Canterbury-road, with external walls at less than the prescribed distance from the centre of the Roadway of Station-road (Mr. A. B. Matthews).—Consent.

Lines of Frontage and Construction.

Hammersmith.—The retention of temporary buildings erected on a site on the east side of Old Oak-road, Hammersmith, and south side of Aldbourne-road (Messrs. Barnett & Brothie).—Consent.

Formation of Streets.

Fulham.—That an order be issued to Mr. A. Blackford, sanctioning the formation or laying out of a new street for carriage traffic to lead from Fulham Palace-road to Colehill-lane, Fulham, and, in connexion with the formation of such street, the erection of buildings (for Mr. L. Harris).—Agreed.

Woolwich.—That an order be issued to Mr. F. Bethell sanctioning the formation or laying out of new streets for carriage traffic on

The Coliseum Revolving Sign.—In reply to a question on the report of the Building Act Committee:

Captain Hemphill (Chairman of the Committee) said that jurisdiction in the matter of fly-signs in London was in the hands of the Borough Councils, the County Council only acting in their default. In the matter of the revolving sign on the Coliseum, the Committee had communicated with the Westminster City Council, inviting them to take action. They had now received an answer from the City Council, saying that they were proceeding in the matter.

Tenders for Pier Work.—The following recommendations of the Rivers Committee were agreed to:—

That the tender of Mr. J. R. Beckett, amounting to £11,106 3d. for repairs and alterations to Hammersmith pier, be accepted.

That the tender of Messrs. Shelbourne & Co., Limited, accepted in respect of repairs and alterations to Chelsea (Raffa) pier, at the amount quoted by them for the pier, viz., £1,250 5s. 7d., be accepted.

That the tender of Mr. J. R. Piper be accepted in respect of repairs and alterations to Chelsea (Cadogan), bridge-pier, and Pimlico piers at the total amount tendered by him for these piers, viz., £2,551 10s. 2d.

That the offer of the Westminster Construction Company, Limited, to execute the repairs and alterations to Chelsea-square and Nine Elms piers for the sum of £492 2s. 4d., as an extra to the existing contract in respect of Millwall, Hammersmith, Putney, and Wandsworth piers, be accepted.

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the Bostall Estate, Woolwich, to lead from Bostall-hill and Bostall-lane to McLeod-road and Blithdale-road, and, in connexion therewith, the widening of a portion of Bostall-lane (for the Royal Arsenal Co-operative Society, Ltd.).—Consent.

Fulham.—For an extension of the period within which new streets on the London Bishopric Estate, Fulham Palace-road, Fulham, were required to be defined and thrown open to the public as highways (Messrs. Cluttons for the Ecclesiastical Commissioners).—Refused.

Means of Escape at Top of High Buildings.
Strand.—Means of escape in case of fire, proposed to be provided in pursuance of section 63 of the Act, on the seventh (top), sixth, and fifth stories in the occupation of the Metropolitan Water Board, of the Savoy Hotel offices, west block, Strand, the upper surface of the floors of which stories are above 60 ft. from the street level, for the persons dwelling or employed therein, and the erection of an open gangway across Carting-lane at the sixth floor level in connexion with such means of escape (Messrs. Colcutt & Hamp for the Savoy Hotel Company, Ltd.).—Consent.

The recommendations marked + are contrary to the views of the local authority.

ARCHITECTURAL SOCIETIES.

DEVON AND EXETER ARCHITECTURAL SOCIETY.
—The annual meeting of the members was held at Tavistock on the 8th inst. There were present Mr. Charles Cole, of Exeter, President; Mr. B. Priestly Shires, Plymouth, Vice-President; and others. The annual report was read by the Hon. Secretary, Mr. A. J. Pinn, of Exeter. It stated that the membership had been maintained, and that the roll-call now stands at 50 members; associate members, 10; associates, 27; total, 87. Since the last annual meeting thirteen meetings—eight being Council and five general—have been held, and some useful work has been done in the interests of the profession; but the Council regret that the response from principals was insufficient to warrant them embarking upon a scheme of lectures in connexion with the London Architectural Association. The Council were indebted to them for making arrangements whereby students of the Devon and Exeter Architectural Society may join the School of Design. Visitors' criticisms will be written upon the drawings; and at the close of the session Mr. G. H. Fellowes Prynn will visit Exeter, upon a date to be fixed, and criticise a selection of the best designs submitted during the session, which will be exhibited at Exeter. A guinea book prize is offered to the competitor whose designs are placed first in merit. The Council regret the absence of enthusiasm among the associates, as evidenced not only by the rare attendance at meetings, but by the lack of competition for the prizes offered by the Society. For the measured drawings only one set was submitted, but they were deemed worthy of the prize, which was accordingly awarded to Mr. Harold S. Shires. No sketches were submitted for the Hon. Secretary's prize. In accordance with the request of the R.I.B.A., it was resolved that the President be appointed a member of the Seventh International Congress of Architects in London, 1906. On December 13 a discussion on "Ownership of Plans," as affected by recent cases, was opened by the Hon. Secretary, and it was resolved that, it being the custom that the drawings are retained by the architect, a communication be made to the R.I.B.A., calling their attention to these cases, and asking them to take steps in the matter. On March 2 a discussion on "Standard Sizes of Materials" resulted in a communication being made to the Secretary of the Clayworkers' Institute asking him to bring before the local brickmakers for their adoption the standard sizes of bricks as agreed to with the R.I.B.A.
—Mr. O. Ralling having read the balance-sheet showing a satisfactory state of funds, it was adopted. The retiring President, Mr. Cole, then delivered his address, in the course of which he said: You will remember possibly that your Council, so far back as September last, endeavoured to ascertain if something could not be done in the matter of providing the younger members of the profession with a definite scheme for their better education in professional knowledge and practical work on well-arranged lines, as distinct from the ordinary routine of the drawing-office, and negotiations were opened with the Architectural Association with a view to obtaining the services of gentlemen willing to

give lectures in various places in the provinces; but I am sorry to say there was so much apathy that it was felt impossible to proceed, and as the expenses would have been, comparatively speaking, very great, the Council reluctantly dropped the scheme. Your Council also appointed a sub-committee to deal with the question of by-laws, more particularly as regards Exeter, whose City Council intend to redraw and remodel those now in existence. The town clerk has kindly expressed his willingness to allow us to lay our views before him. On the general question of by-laws, so much has been written and said lately that one hardly knows whether to let this burning question go on burning or add more fuel to the flames. Of course, there must be by-laws, that everyone admits; but the model by-laws one would fancy were drafted by men who had never done any practical work at all, and, as all local authorities copy them to a great extent, we get some very curious anomalies. They must not introduce any clauses suitable to their locality, or make any of them at all elastic, or the Board above will refuse to sanction them. So we get this strange state of affairs: A little one-house town in the wilds of No-where has the same by-laws as a large city, which is preposterous. The effect of some by-laws is that in large towns many old buildings are not pulled down and rebuilt, because in addition to light troubles and party-wall questions, which bulk largely, the unfortunate architect has still to deal with the local authority, whose views are often—well, I will say, "quaint." If there were any elasticity many a client would rebuild entirely, instead of "tinkering" by taking out a floor, putting up a new front, and so on, often involving a great deal of trouble and anxiety, and a liberal use of steel or ironwork. Even if a new building did not quite comply with all the cast-iron rules of the powers-that-be, it must be a great sanitary advance on the old timber building crusted with age and other things in its numerous cavities and worm-eaten woodwork. Perhaps one of the most irritating features of the whole thing is that, where a local authority is willing and anxious to frame sensible by-laws to suit its locality, the Local Government Board will have none of them; but the question is interesting the man in the street. He begins to see now why all the houses are built alike in a new street; why there are no wooden bays or good half-timber work. I am glad to say that progressive Exeter does allow the two latter, and has also approved of bay windows projecting over our streets, so that architects get some chance of breaking up a front. . . . In speaking of the registration of architects, Mr. Cole said that it was gratifying to a great number of provincial architects to know that the premier body had come to the conclusion that something must be done, and had actually done something. "With a proper legal status, were we more united, I do not think the courts would ride rough-shod over us as they often do now. Take the ownership of drawings question; 'it is only an architect's matter'; and the greatest injustice is done; the drawings are only the means to an end, and yet forsooth a cantankerous client, even if he cannot understand which is the right side up of a plan, may insist on having the drawings handed over to him. They are of little service, and nowadays not even drain plans are as necessary as they used to be, because the manhole covers and gullies show exactly where the pipes are; and now I note that the Master of the Rolls has lately dismissed the appeal against the decision of Mr. Justice Ridley, that the architect must give up the plans he had prepared for certain flats. Plans of buildings erected during the course of his career, together with his brains and experience, are the architect's stock-in-trade; but, unless he goes to the trouble and expense of making tracings, all his records may be swept away. I have pointed out to clients before now that if the drawings are taken away they will assuredly be lost. Time has already, on more than two occasions, proved the correctness of my statement, and the strayed ones have been restored to the fold. I must say that I think the R.I.B.A., with their splendid income, and—if I am correctly informed—substantial reserve should help the profession, or at least their own members, to fight with all its strength such legal injustice and unfairness. . . . The architect has to face competitors on every hand. The enterprising builder keeps the tracings of various works of which he may become possessed.

Even if the architect is sharp enough, and insists on their being returned before the issue of the final certificate, his office-boy does the needful with pen, ink, and tracing paper, and many a clever design is repeated *ad nauseam* in a row of jerry-built houses, or put in a more pretentious building in entirely the wrong position. The auctioneer and house agent has a little field-day occasionally. . . . The engineer, too, builds a steel bridge and loads the spandrels with tons of cast-iron 'ornament,' bolted on securely to prevent the structure iron rising on its pin joints or hinges, and shaking off its architectural adornments into the river below. Its balustrade panels are Gothic, so are the bases of its electric light standards, all fearfully and wonderfully designed and made. There are beautiful castings further up the steel posts, but these are not Gothic, and the lamps look down bashfully and admiringly on the bases, and wish that they had crochets on their shades. Generally speaking, the past year has been one of bad trade, and naturally people do not proceed with new works under such circumstances. Let us hope that shortly matters may improve and work found for a very deserving class, and that those who promote competitions may so draft the conditions that architects may feel that they will be treated fairly. The public and committees generally have only very crude ideas of the enormous amount of work involved in preparing the necessary drawings, and I think that the suggestion of the R.I.B.A. is most excellent—that promoters should pay a successful competitor 1½ per cent. on the estimated cost of a delayed or abandoned scheme; but one may call 'spirits from the vasty deep.' The question is, Will they come? I do not propose to give the ordinary schedule of works carried out either locally or throughout the country. You can all read that for yourselves; but I really believe the public generally are taking more interest in architects and their works, and one hears less and less every year of the coarse remark or jest that 'they keep the cost of the work up because they are paid a commission on it.' . . . We must all endeavour to see that the younger men who come in have a real love for a beautiful art and science, and are determined to be a credit to it by being well-informed in all its various ramifications; because, after all, even with registration—let me misquote—the name is but the guinea stamp; the man's the gowd for a' that." Mr. Cole then proposed Mr. B. Priestly Shires as President for the ensuing year. This was seconded by Mr. Parker, and agreed to. Mr. Harbottle Reed was elected Vice-President; Mr. A. J. Pinn, Hon. Secretary; Mr. Octavius Ralling, Hon. Treasurer; and to fill vacancies on the Council, Mr. A. J. Lucas, Mr. J. Jermain, Mr. O. B. Feyer were elected. The meeting was followed by luncheon at the Bedford Hotel, the party being shown over the Vicarage grounds by the vicar. Then an inspection of the church was made. Then followed a drive to Walroddon, an ancient manor house of the Courtenays.

ENGINEERING SOCIETIES.

THE INSTITUTION OF CIVIL ENGINEERS.
At the ordinary meeting on the 11th inst. Sir Cunliffe Molesworth, K.C.I.E., President, in the chair, the paper read was, "The Maintenance and Strengthening of Early Iron Bridges," by Mr. W. Marriott, M.Inst.C.E. The following is an abstract of the paper:—The paper deals first with the strengthening of an iron bridge over the River Ouse, consisting of three spans of 117 ft., and two end spans of 70 ft., the reinforcements consisting of extra plates to increase the flange-area and provide extra rivets for the braces, new cross girders and flooring. The bridge was thus brought up to modern requirements at a cost of some 8,000. Next is given a description of the strengthening of a bridge over the River Thurne, consisting of three spans of 79 ft. each, which necessitated extra plates at all panel-points to give extra rivet-area, new cross girders and longitudinal, and re-arrangement of flooring. The work on this was done while traffic was running, at a cost of about 2,000. A method of reducing the stress in old bridges by reducing the permanent dead load is also dealt with, and an example is given. The author proceeds to state the difference, from a maintenance point of view, between iron and steel, and records the experience of over twenty years in the

COMPETITIONS.

CONGREGATIONAL CHURCH, CROOKES, SHEP-FIELD.—Plans for a new church and additional schoolroom have been prepared for the Crookes Congregational Church, Upper Springvale-road, Sheffield. The buildings are to be erected on the site at the corner of Springvale-road and Western-road. Mr. E. M. Gibbs, F.R.I.B.A., was appointed assessor for selecting the sets of plans to receive premiums of 20*l.* and 10*l.* respectively, and he has awarded the first premium to Mr. W. J. Hale, and the second premium to Mr. W. T. Campsall. The other designs selected by the assessor in order of merit were those of Mr. J. Norton, Mr. W. Boddoe Rees, Messrs. C. J. Innocent & Son, Hall & Fenton, and Mould & Porritt. The church have agreed to accept the award of the assessor, and Mr. Hale will be entrusted with the building of the new church.

PUBLIC BATHS IN KILBURN.—Willesden Urban District Council resolved on Tuesday to offer premiums of 100*l.* and 50*l.* for the first and second best designs for the erection of new public baths in South Kilburn. The services of an architectural assessor are to be obtained to assist the Council in determining which designs exhibit the greatest merit.

Correspondence.

ARCHITECTS' DRAWINGS.

SIR,—Noticing your report on the ownership of plans in the recent case of *Gibbon v. Pease*, we would like to point out to architects that, in view of this recent decision, and in the interest of their profession and the old-standing custom upon this point, that the best course to adopt would be, in the future, to have an agreement with all clients that the plans and all documents are the architects' property at the completion of the works, and to insert such a clause in the conditions of contract.

Of course, then, if a client requires plans, etc., at the completion of his work, these would be considered outside of the ordinary professional duties of an architect, and would, therefore, have to be charged for at an extra-special fee. R. E. CARPENTER & SON, Quantity and Measuring Surveyors.

MAPLE FLOORING.

SIR,—Will you kindly allow me, through your columns, to ask for a little information on maple flooring?

Having a quantity of 9-in. by 3-in. by 14-in. maple block flooring to lay, I should like to know if any of your readers have had any trouble with this wood after it has been properly laid with well-seasoned blocks, as I have been informed by persons in the trade that maple is not reliable as a block floor.

Any information will be gratefully received by
CONSTANT READER.

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE-STEEL.—XV.

A FRENCH VILLA RESIDENCE.

BOURG-LA-REINE, a modern village of some 3,500 inhabitants, is a favourite summer resort about three miles along the Orleans road on the southern side of Paris. In this place is situated the villa described in our present article, and which has been built entirely of concrete-steel, under the Hennebique patents. The site of the house and garden covers an area of nearly 25 metres square, the eastern and southern sides of which are bounded by the Avenue Victor Hugo and the Avenue du Lycée-Lakanal, respectively.

The house formerly standing on this plot of land was a long narrow building, and with its outbuildings extended along the whole frontage on the last-named thoroughfare. Built of the volcanic stone known as tufa, architectural character had been neglected in its construction, as much as the comfort and health of its occupants.

The new structure, erected at the north-east angle of the site, and with the principal façade on the Avenue du Lycée-Lakanal, suffers from too much architectural character. It is one of those weird constructions from which, with all our defects, we have been spared in England, except perhaps in outdoor exhibitions and at some popular watering-places. Viewed from the street, the villa presents an appearance

something like that of a pier pavilion with a promenade deck on top, and from its midst springs a water-tower, which, rising to the height of 40 metres above the road level, is suggestive of a lighthouse combined with the fighting top of a modern warship.

The illustrations given this week do not include a section of the tower, but a cross-section at the *rez-de-chaussée* will be found in Fig. 106, which is a ground-floor plan of the villa. So far as internal arrangements are concerned, however, there is no ground for criticism. The house is admirably planned—spacious corridors and balconies connect the rooms of the principal floors, terrace and roof gardens, conservatories and towers provide ample space for flowering plants, and special attention has been devoted to means of access for light and air.

The gradient of the Avenue du Lycée-Lakanal, from the corner of the Avenue Victor Hugo, is about 1 in 14, in consequence of a cutting made in the direction of Bourg-la-Reine railway station, but the level of the garden remains practically unaltered, the earth being held up by a retaining wall. This peculiar condition of the site presented some difficult problems for solution; among them being that of providing convenient means of access to the coach-house of the new building. Again, the rain-water drains, as well as those of the kitchen and other domestic offices, discharged into a well, or catch-pit, on the adjoining property. Thence the water flowed to the street gutter, which it was compelled to follow for a distance of about 350 metres, because no drains or sewers had been provided in the avenue. This state of things, as may readily be imagined, was not entirely appreciated by residents in the immediate neighbourhood.

After careful consideration, the architect was enabled to utilise the steep gradient of the Avenue du Lycée-Lakanal in the following manner. He decided that the *rez-de-chaussée*, or ground floor, of the new villa should be level with the road surface of the Avenue Victor Hugo, and that the *sous-sol*, or basement floor, 3 metres below, should correspond in level with the footpath of the Avenue du Lycée-Lakanal (see Fig. 109). This arrangement enabled him to establish at road level various rooms and domestic offices, comprising the servants' hall and bedrooms, living rooms for the gardener, a lodge or lobby for the *concierge*, a motor-car garage, cellars for wine in casks and bottles, coal and wood cellars, provision and fruit stores, a hot-water boiler-room, work-rooms, and a photographic laboratory. Further, what was of some importance to members of the family going daily to their business in Paris, it permitted the private entrance of the villa to be situated conveniently for access to the railway station. This entrance opens into a lobby communicating on one hand with the passage leading to the store-rooms and wine cellars, on the other with the room of the *concierge*, and is at the foot of the stairway lettered "entrée" in Fig. 106. The store-rooms and cellars are beneath the hall and children's rooms on the ground floor. They are almost entirely underground, for on the garden façades, as indicated by the section (b) in Fig. 107 and by Fig. 108, the level of the garden having been raised by earth excavated for the construction of the foundations and the basement. The old party wall, indicated by broken lines in section (b), Fig. 108, was demolished and rebuilt in stone, the position of the new wall, *noeuv mur mitoyen*, being shown in Fig. 106. The heating chamber, which contains a hot-water boiler, is placed near the base of the water-tower, and is provided with alternative means of access, one from the outside, by way of the tower staircase, and the other from the inside by a lobby at the foot of the service staircase. Thus stoking can be performed from the outside without communication with the house, or from the interior as may be most convenient for the domestic staff. The flue of the hot-water boiler may be observed close to the water-tower, in Fig. 106.

Fig. 107 contains various sections of the concrete-steel walls and foundations; (a) is a section through the wall of the forecourt below, the *balcon* of the *salle à manger*; (b) is a section through the northern wall of the wine cellar, showing bins on the inside and the old party-wall on the outside; (c) is a section through an inner wall separating two of the cellars; and (d) is a section through the wall of the *concierge's* room. With the exception of the

preservation of bridges, etc., from rust; after describing various methods, he ends by recommending the use of Portland cement for the purpose, giving examples of its use.—It was announced that ten associate members had been transferred to the class of members, viz., Messrs. H. A. Cutler, S. C. Markley, J. P. Harris, A. S. Jones, J. Lord, H. C. Marks, L. S. M. Marsh, A. S. Napier, J. W. Ransome, F. Worthington. It was also reported that six candidates had been admitted as students. The monthly ballot resulted in the election of one member, eight associate members, and one associate.

THE JUNIOR INSTITUTION OF ENGINEERS.—A large number of members of this Institution visited the Willesden Power House of the North Metropolitan Electric Power Supply Company, at Taylor-lane, on the 6th inst. In the absence through illness of the engineer, Mr. E. T. Ruthven Murray, they were conducted round by the station superintendent, Mr. F. D. Napier, and his assistants. The vice-chairman of the Institution, Mr. Adam Hunter, at the conclusion of the visit expressed the acknowledgments of the members for all that had been arranged for their reception. The continuous current is generated directly at a pressure of from 400 to 540 volts, suitable for the 2 by 240 volt network surrounding the works, and this fixes the average pressure of the alternating current terminals of the same generator at 360 volts; the machines being, as it were, rotary converters driven by engines. Step-up transformers, with a ratio of 1.9 are employed, raising the pressure to an average of about 2,850 volts, at which it is transmitted to the sub-station. There variable-rate step-down transformers and rotary converters once more reduce the pressure down to that suitable for a 2 by 240 volt three-wire continuous-current distribution. The site of the station occupies an area of 3½ acres, and adjoins the Midland and South-Western Junction Railway, to which access can be gained to all the great northern lines. The boilers are of the Babcock Wilcox type, arranged in pairs, built in glazed brick settings. Draught gauges are fitted, and an "Adco" registering CO₂ recorder. There are six steam feed pumps, and a Mather & Platt electrically-driven pump, the latter having a special device for effecting its regulation. The arrangement of steam mains is novel. A jet condenser by Ashton Frost & Co. is provided for the two 300 K.W. sets, while the other sets have their own surface condensers. There is a cooling plant supplied by Korting Bros., on which are four lines of spraying jets. The surface of the pond is 30 ft. by 200 ft., and it is capable of dealing with 100,000 gallons of water per hour, which is the storage capacity of the pond. All water is softened by a Brunner-Lowmeyer apparatus, in which milk of lime and soda is used. For the general arrangement, and for the design of many of the special details of the low tension continuous-current switchboard, Mr. Ruthven Murray was responsible. His object was to arrange a switchboard embodying the distinctive and valuable features of the recent high-pressure cellular type of switch gear for low-pressure working. The principal feature of novelty in the low-tension switchboard is that four separate "bus bars" are provided, and there are "Selector Switches," which enable any machine or feeder to be connected to any "bus bar." The battery-room contains 250 Tudor cells, with a capacity of 840 ampere hours, at a ten-hour discharge rate.

BOOKS RECEIVED.

REINFORCED CONCRETE CONSTRUCTION. Part I: Methods of Calculation, by A. W. Buel; Part II: Representative Structures, and Part III: Methods of Construction, by C. S. Hill. (London: Archibald Constable & Co. Ltd. 21*s.* net.)
A HANDBOOK FOR SUPERINTENDENTS OF CONSTRUCTION, ARCHITECTS, BUILDERS, AND BUILDING INSPECTORS. By H. G. Riehey. (New York: J. Wiley & Sons. London: Chapman & Hall, Ltd. 17*s.* net.)
THE MERCHANT'S CLERK. By John Pearce. 20th edition. (London: E. P. Dutton & Co. 2*s.*)

WHISTLER EXHIBITION.—Owing to previous arrangements the Whistler Memorial Exhibition at the New Gallery, Regent-street, which has already been visited by almost 60,000 persons, must close this Saturday.

party-wall, the whole of the foundations, walls, and other details in the basement are of concrete-steel.

Two entrances give access to the reception rooms of the villa. The principal entrance, or that used by visitors, is reached by a carriage-way leading from the Avenue Victor Hugo through the garden and up to the *perron* outside the doorway of the *grand hall*. This apartment, with a length of 9.50 metres and a width of 8 metres, opens upon the *salon* and *salle à manger* on the right hand, and upon the *réfectoire des enfants* and *cage d'escalier* on the left hand. The second entrance, intended for use by the family, is that previously mentioned, and gives access to the staircase rising from the Avenue du Lycée-Lakanal to a vestibule which opens into the *salle à manger* on one side, the *vestiaire* on the other, and leads also to the *perron* outside the *grand hall*.

Ventilation of the entire suite of rooms on the ground floor is effected by various openings and air ducts in addition to the windows and doors. The verandah-conservatory (*serre*) of the *salon* (see Figs. 106 and 109) faces the east, and is completely separated from that room by a glazed partition with a door at either end and a large sliding sash in the middle. One end of the conservatory is connected with the open balcony outside the *salle à manger*, a current of air is established between the balcony and the north gable of the villa, which projects beyond the general façade. These structural features provide excellent means for regulating

the temperature of the *salon*, to which ample light is admitted through the glazing of the conservatory.

Fig. 106 shows the position of the kitchen, which, being 5 metres in height and exposed on three sides to the outer air, can be very efficiently ventilated so as to prevent the smell of cooking from reaching the dining-room and other parts of the house. It should be mentioned that the upper part of the kitchen is separated from the dining-room by a linen store on the mezzanine floor, beneath which there are a service-room and a corridor affording communication between the kitchen and the dining-room. This passage is formed with a floor of concrete-steel extending over the entrance lobby at the foot of the private entrance in the Avenue du Lycée-Lakanal. On the western side of the hall the children's dining-room, nursery, and bathroom constitute an entirely separate suite of rooms and yet are quite easy of access. The nursery is well lighted and at the same time shielded from the direct rays of the sun by the octagonal tower and the balconies of the first story (shown in broken outline in Fig. 106). A separate stairway leads from the nursery directly into the garden. All the principal rooms on the ground floor have the uniform height of 5 metres.

With the object of preserving as far as possible the existing levels and arrangement of the garden, and to avoid the destruction of trees, it was decided to make the nursery of the form shown in Fig. 106, where one outer

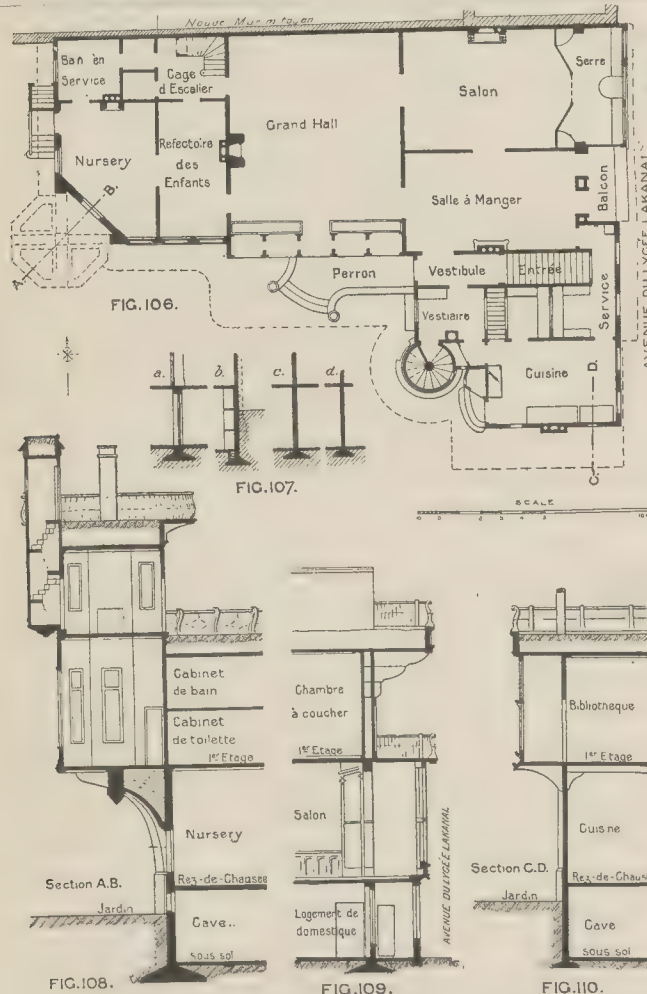
wall is at an angle of 45 degrees with the other two outer walls. We really cannot see that this course was at all necessary, but its adoption gave rise to a piece of construction which is of interest to students of concrete-steel design. Thus, on the first floor it was very desirable to provide a small *salon* to be used for needle-work or a *boudoir*, and the most convenient position was above the angle cut off from the nursery, where it is, so to say, suspended among the foliage of the trees near the house. This room occupies the lower portion of an octagonal tower, whose position is indicated by broken lines in Fig. 106. Fig. 108 gives a section of the tower, which has a weight of 180 tonnes, and projects about 3.50 metres from the wall of the nursery without taking into account the circular turret near the top. The diameter of a circle inscribed within the walls of the octagon is 4 metres, and the inner surface of the wall next to the main building is a continuation of the outer wall surface on the ground floor. Rising above the level of the terrace garden on the roof of the main building, the upper portion of the tower affords space for a kiosk, the flat roof of which is covered with a bed of earth 1 metre deep, in which fruit-trees are planted. A wide exterior balcony of concrete-steel extends round the tower and constitutes a very pleasant retreat in summer-time. Of course a staircase was required for access to this little terrace, and, by the ingenuity of the engineer delighting in the task of overcoming a difficulty, a concrete-steel circular staircase was provided in a turret built on the exterior face of the octagonal tower and projecting beyond a door opposite to that opening from the main roof garden.

Returning to the ground story, we may point out that ample shade is provided along the western and southern façades by the balconies, galleries, and tower indicated in broken outline in Fig. 106, and, to some extent, in section by Figs. 108 and 110.

The broad projecting terrace overhanging the principal entrance shields it in a large measure from the direct rays of the sun. The concrete-steel uprights which carry the corbeling are of double-T section, as shown in plan by Fig. 106, and have a thickness of 11 centimetres, the recessed part of the uprights serving to receive the hinged window sashes and shutters, which remain open throughout the summer, thus virtually transforming the *grand hall* into an interior court, from which the whole of the house is abundantly supplied with fresh air.

Above the two stories of which the general arrangement has been described is the first floor, occupied chiefly by bedrooms, but including also some other apartments devoted to work or recreation, while a portion of the *avenue* is laid out as a terrace garden, in communication by means of covered balconies with all the principal rooms. The flat roof of the villa is covered with earth 1 metre deep, for the formation of a second terrace garden, except in one part, which is occupied by a hot-house. In this building, the main features of which have been outlined above, concrete-steel has been utilised from the most important members down to the smallest details of the construction. The valuable quality possessed by this material of accommodating itself to all forms of design, and at the same time of permitting the economical attainment of the necessary resistance in every direction, is here demonstrated in most characteristic fashion.

In order to obviate the necessity for covering the cement surfaces of the walls with stoneware, all the exterior facings were composed of slabs, from 3 to 4 centimetres thick, moulded in advance in courses about 30 centimetres high, this being the most suitable height for making a good layer of concrete. For facing slabs took the place of timber moulds for the inner concrete of the walls after depositing the reinforcement had been disposed in accordance with the working drawings. The villa at Bour-la-Reine embodies the first practical application of concrete-steel facing slabs in the manner described, but we may mention that it has since been adopted by several licensees under the Hennebique system, notably in the bridges of Soissons and Decize. The method includes a new and ingenious application of the principle of transverse reinforcement in the form of flat bands of steel, and is particularly worthy of notice because it offers a ready means of obtaining natural facings of different grain and colour without the necessity for covering the surface with paint or a veneer of coloured tiles or terra-cotta.



Illustrations to Student's Column.

We may here point out, as particularly shown in Fig. 108, the magnitude of masses built in consoles, the great arm of the piers and floors which support them. Nevertheless, not the slightest sign of excessive strain is manifested in any part of the construction, no fissures or incipient cracks are to be detected in the concrete of the consoles, nor in that of the floors of the first story, nor of the flat roof of the villa. Two summers and two winters have passed since the execution of this work, during which it has been subject to the stresses due to the dead and live loads, and to expansion and contraction arising from temperature variations.

Simplicity of construction is particularly characteristic of the corbelling of the octagonal tower, which, as shown by Fig. 109, is formed by continuations of two walls of the main building, the point of intersection being identical with the central axis of the tower supported. Beyond the point where the two main elements of resistance of the corbelling intersect at right angles, the same members are continued to the piers, as represented in Fig. 108.

This is an admirable example of the advantage which appertains to concrete-steel construction, making it possible to provide members for easily withstanding stress encountered under particularly trying conditions, notwithstanding the fact that the members in question are disposed so that they converge at and pass through a point at which the substance of each is penetrated by that of the other.

In steel construction, junctions of this kind would be sources of great weakness, but as previously demonstrated in Article XII., p. 388, they present no difficulty whatever to the designer who is familiar with the theory of concrete-steel, and who has learned to appreciate the wonderful facilities and possibilities it offers.

OBITUARY.

MR. FRANK CAWS.—We regret to announce the death of Mr. Frank Caws, which occurred at his residence, 1, Bellevue-crescent, Sunderland, on Saturday, last week. Mr. Caws was born at Sea View, Isle of Wight, fifty-nine years ago, and, after serving his articles at Ryde, went through a course at Kensington School of Art, where he took several prizes. Mr. Caws then received an appointment at Darlington, where he did some work for the North-Eastern Railway Company, after which he was engaged at Wolverhampton. He went to Sunderland at the age of 21, and, after staying with Messrs. Potts & Sons for a while, he opened an office on his own behalf. Mr. Caws designed many structures in the town and elsewhere. A pier at Sea View and the suspension bridge across the Wear at Stanhope are also the work of the deceased gentleman, who was a Fellow of the Royal Institute of British Architects, and was twice President of the Northern Architectural Association. Mr. Caws leaves a widow and grown-up family of four daughters and one son. The funeral took place at Bishopwearmouth Cemetery, Sunderland, on Tuesday, when a large number of architects and others were present.

GENERAL BUILDING NEWS.

WILKINSON CATHEDRAL EXTENSION.—Earlier will see the completion of the monument to the late Bishop Walsham How. The plans for the work were originally prepared by the late Mr. J. L. Pearson, R.A., and the extensions have been carried out, under the superintendence of his son, Mr. F. L. Pearson. The extension has been extended eastward by about 60 ft., and this addition has meant an extension of the chancel, increased length to the choir, and the provision of a retro-choir, while further eastward, and screened by the piers, is a chapel. This is approached from the retro-choir, and is really a continuation of the chancel. The chancel aisles have been extended to the same extent as the retro-choir, and these extensions take the form of south and north transepts, with eastern aisles. The plans have resulted in a rearrangement of the cathedral fittings, more particularly in the organ and choir. An old vestry has been removed into an organ chamber, and the choir stalls have been extended. Canopies have been added, and the screen has been fixed. The old reredos, which screens the new chapel is being adapted for its new place, and is being supported by a stone back. The fitting of the chapel is a design of elaborate tracery graining. A feature in the memorial scheme is the tomb with the recumbent figure

of the late Bishop Walsham How, who is represented in his episcopal robes, and this is now being placed in its position. The extension buildings include three large stained-glass windows, in addition to the children's window. One is in the east, another in the north transept, and the third in the south. The natural slope of the ground on the eastern side enabled the architect to prepare plans for additional cathedral accommodation. Unsurpassed the chapel is a chapter-house, and two vestries, one for the clergy and the other for the choir. Access to these from the interior of the cathedral is obtained by a staircase on the north side, and there is also an external entrance on the south side, which leads into a corridor that runs from north to south. The general contract for the extension has been carried out by Messrs. Armitage & Hodgson, of Leeds, and Mr. W. J. Crook has acted as clerk of the works. Mr. Forsyth, of London, has been the artist for the recumbent effigy of the late bishop. The consecration of the new portion of the cathedral will take place on Easter Tuesday morning, by the Bishop of Wakefield.

BUILDING AT MIDDLESBROUGH.—During the present municipal year, 365 sets of plans, including ten for villas, 305 for houses, and sixteen for shops, have been approved by the Middlesbrough Town Council, this number being 104 in excess of that for the same period of last year. During this time 289 houses have been certified as fit for habitation, and 235 are now in course of erection.

RESTORATION OF ALL SAINTS' CHURCH, DERBY.—Repairs are being carried out at this church by Messrs. Rudd & Sons, Ltd., contractors, of Grantham, the architect being Mr. Temple Moore, of Hampstead, London. Mr. A. Brennan is the clerk of the works.

REPAIRS TO ST. THOMAS' CHURCH, COVENTRY.—It is proposed to repair this church, and Mr. Arthur Dixon, architect, of Birmingham, has prepared a report on the work required to be done.

RESTORATION OF TIDESWELL CHURCH.—On the 6th inst. the Bishop of Southwell dedicated the restoration work which has been carried out at the west end of this church. The restoration includes the erection of oak porches, a screen, and doors. The work is Gothic in design, and has been supervised by Mr. J. Oldrid Scott, of Westminster.

COUNCIL SCHOOL, READING.—The new Joseph Henry Wilson School, which has been built in the Grovelands-road East Reading, has just been opened. The buildings have been arranged in three principal blocks, the two larger blocks being devoted to ordinary school purposes, and the third, which is kept on the western boundary of the site, is to be used for technical instruction—viz., metal-work and cooking and laundry work. The school is arranged in four departments, and contains the following accommodation:—In the northern block on the ground floor 365 infants, on the upper floor 336 junior mixed. In the southern block on the ground floor 308 intermediate mixed, and on the upper floor 308 senior mixed. In the general arrangement of plan each department is similar, having a central hall, with classrooms on three sides. The head teacher's room is placed in the centre of the west side of the hall, and commands an oversight, not only of the various classrooms, but also of the playgrounds. There is a room for the teaching of science on the upper floor of the southern block, and a room for teaching drawing on the ground floor of the same block. Each block contains, in addition, separate cloak lobbies, and lavatories for boys and girls, rooms for assistant teachers, caretaker, stores, etc. The buildings are heated by low-pressure hot water, the boilers being placed at the northern end of the blocks in the basement, whence the heating pipes are conducted to the various rooms by special ducts, below the floors, so that the pipes are always accessible. The various apartments are fitted with ventilating radiators, and lighted by electric light. The technical block contains a school for manual instruction, metal-work, and engineering, with benches for twenty boys. This shop has forges, lathes, drilling machines, etc., in addition to a bench and vice for each boy. The machinery is driven by overhead shafting served by an electric motor. The cookery and laundry school has one large room, with raised gallery, and appliances for teaching and demonstration, while adjoining this school is a suite of rooms fitted up as a cottage for instruction in housewifery. In the playgrounds, which are asphalted throughout, are covered playing-fields and ranges of sanitary buildings for the various departments. Internally, the walls are brickwork, coloured in Duresco. The dadoes in the corridors and staircases are of salt-glazed bricks, while the dadoes in the classrooms are formed with Blundell Spence's liquid enamel on ordinary brickwork. The joinery is of pitch-pine, stained and varnished, and the

floors of the central halls and corridors are fireproof, with wood blocks. Externally, the buildings are of local red brick, with mottled Hollington stone dressings. The general building contract has been carried out by Messrs. J. Norria & Sons, of Sunningdale; Messrs. T. C. Williams & Sons have executed the heating and ventilation; Messrs. Baughan & Son the electrical work for lighting throughout and machinery; Messrs. Mackies, Ltd., the machinery in the metal-work and engineering school; and Messrs. Taylor & Gillard are supplying the portable tools. The architects are Messrs. Charles Smith & Son, of Reading; and the clerk of the works Mr. C. H. Lanfear.

COUNCIL SCHOOL, CHATHAM.—The foundation-stone has just been laid of a new Council school which is being erected in Glencoe-road, Chatham. The building will accommodate 900 children—300 boys, 300 girls, and 300 infants. The cost is estimated at 13,540l. The work is being carried out by Mr. H. E. Phillips, with Mr. T. Cramp as clerk of works, and the architect is Mr. H. H. Dunstall. One block of the buildings will be for boys and girls, the boys being on the ground floor, and the girls above, while a cookery school is to be provided in the basement. There will be a central hall, surrounded by six classrooms. The same principle is to be adopted in the other block, with ground floor only, for the infants. The corridors are to be lined with glazed bricks, and the staircases will be made of concrete.

BATHS, SELLY OAK.—On the 27th ult. Councillor William Holmes (Chairman of the Baths, Parks, and Cemeteries Committee of the King's Norton and Northfield Urban District Council), laid the foundation-stone of the new baths which the Council have decided to erect upon a site in Tiverton-road, Selly Oak. There will be swimming baths for men, 75 ft. by 30 ft.; for women, 24 ft. by 26 ft.; spectators' galleries will be provided, and it is proposed also when, in winter, the large men's swimming bath is not required, to lay boards over it so as to make provision for the holding of public meetings. The architect is Mr. Harding Payne.

EXTENSION OF INFIRMARY, OLDEHAM.—The new extensions to the Oldham Infirmary, which commemorate the reign of the late Queen Victoria, were opened recently. Built and furnished at a cost of upwards of 20,000l., the extension provides beds for forty-three patients, seven servants, and one attendant, making a total of fifty-one beds. The accident, dressing, and waiting rooms have a separate entrance, which is screened from the public view. The main public entrance is centrally placed in Union-street West, and leads to a central hall. The two new operating theatres will serve the purpose of both the old and the new premises in future, enabling the governors to utilise the two former operating theatres in the original building as small wards, thereby increasing the number of beds available for patients. The sanitary arrangements for the new extensions are in a separate block. The walls of the wards have an opalite dado, and are finished above in cement plaster and special lacquer. The walls of the operating theatres, lavatories, and basement are finished with opalite tiling from floor to ceiling. The floors are all of concrete, finished either with teak wood blocks or marble mosaic. The hoist is worked by electricity, and is of sufficient capacity to receive a patient's bed and two attendants. A complete installation of telephones for the whole of the institution has been provided. The lighting is by electricity. Mr. T. Taylor was the architect of the extensions, and the contractors who have carried out the work were:—Messrs. Ogden Brothers, excavating, brickwork, and concreting; Mr. Samuel Smethurst, masonry; Mr. William Lees, carpenter and joiner's work; Mr. James Hall, plastering; Mr. Joseph Jackson, slating; Messrs. S. Ashton & Sons, external plumbing and glazing; Mr. William Collier, internal plumbing, etc.; Mr. William Hand, decorating; Messrs. Keith, Blackman, & Co., heating and ventilating; Messrs. Drake & Gorham, electric work; Messrs. Lancashire and Cheshire Opalite and Tile Company, opalite tiling; Messrs. Doulton & Co., general tiling and sanitary fittings; Messrs. Rusts, Vitreous Glass Mosaic Company, mosaic flooring; Messrs. C. Schofield & Co., general fitting; Mr. William Lees, general fitting; Messrs. G. Walker & Co., wood-block flooring.

NEW WORKHOUSE, TETBURY.—The Tetbury Board of Guardians have accepted the tender of Mr. George Drew for the rebuilding of the workhouse. The amount was 3,550l., less 150l. for old material. Mr. Lawson, the architect, was instructed to negotiate separate contracts for the supply of the heating, laundry, and cooking appliances for the new house.

QUEEN'S JUBILEE HOSPITAL, EARL'S COURT.—At the recent annual meeting of the governors of the Queen's Jubilee Hospital, Richmond-road, Earl's Court, the chairman of the Board of Management announced that they had requested the architect, Mr. Blackford, to submit an estimate showing what portion of the proposed extension of the hospital buildings could be constructed for 2,500*l.*, and that Mr. Blackford advised it would, in his opinion, be better to erect one floor upon the remaining part of the site. The work has been proceeded with, so far as the resources of the hospital allow, and the new building will form the out-patients' department of an extension which it is hoped will be ultimately completed.

CONGREGATIONAL CHURCH, WEST HAM.—The East-road Congregational Chapel, West Ham, has been recently purchased by the Committee of the Royal Association in Aid of the Deaf and Dumb, of No. 419, Oxford-street, W., who are about to restore the fabric and re-arrange the building for the purposes of a church and institute after designs by Sir Arthur Blomfield & Sons.

FLATS, WESTMINSTER, S.W.—The contract for the erection of Cathedral Mansions, to occupy the sites of Nos. 258-266, Vauxhall Bridge-road, Victoria, S.W., has been signed between Mr. Tod Heatly, D'Eresby House, Ltd., and Mr. C. Gray, contractor, of Kensington and Shepherd's Bush, and the work is to be commenced at once. There will be a roof garden for use of tenants. The elevation will be carried out in cherry-red bricks, gauged work, and dressings of terra-cotta by Dennis, of Ruabon. Messrs. Palgrave & Co., Westminster, are the architects. Mr. Farrell is the clerk of works.

APPOINTMENTS

BERMONDSEY.—At a recent meeting of the Bermondsey Borough Council Mr. W. E. C. Hasnan, M.Inst.E.E., was appointed, out of sixteen candidates, Electrical Engineer to the Council.

LEEDS.—It is expected that next week the Sewerage Committee of the Leeds Corporation will come to a definite decision respecting the appointment of an engineer for carrying out the new works that are in contemplation. Three candidates are still in the running—viz., Mr. Alfred Fidler, Borough Engineer, Northampton; Mr. Joseph Garfield, Sewerage Engineer to the Bradford Corporation; and Mr. George Adam Hart, Chief Assistant-Engineer to the Birmingham, Tame, and Rea Drainage Board. The Improvement Committee of the Leeds Corporation considered, on the 10th inst., the question of appointing a city engineer in succession to Mr. Thomas Hewson. Having regard to the duties being narrowed by the decision to appoint waterworks and sewerage engineers as separate offices, it was thought advisable to refer the matter to a sub-committee, who will inquire into the work to be transacted by such an official, and report.—*Yorkshire Post.*

SANITARY AND ENGINEERING NEWS.

SEWAGE WORKS, SKIPTON.—The pressure brought to bear on the Skipton Urban Council by the West Riding Rivers Board has borne fruit in a supplementary scheme of sewerage treatment, details of which were submitted to the Council on the 6th inst. by their engineer, Mr. John Mallinson. The estimated cost of the new works is 12,500*l.*, and the Council authorised compliance with the usual formalities.—*Yorkshire Post.*

SCARBOROUGH MARINE DRIVE.—Much concern is felt in Scarborough, it is stated, at the precarious condition of the Marine Drive seawall, enclosing the new promenade round the base of the Castle Hill. Mr. James Walker (Engineer to the Tyne Commissioners), who had been retained to give expert advice as to the damage wrought by the high tide and gale of January 7, recommends remedial works with the utmost possible expedition, as, owing to the blows of the sea, the pressure of water at the back, and the absence of support at the toe, the structure has been so severely shaken that it is in the first stage of disintegration. Unless it is strengthened in a thoroughly satisfactory manner, another severe storm may cause a breach. The damaged portion, Mr. Walker points out, is roughly, 540 yds. in extent, and he suggests the construction against the front of this section of three concrete-mass buttresses, at an estimated cost of 8,000*l.*

WATER SUPPLY, RYDE.—On the 1st inst., an inquiry was held at the Ryde Town Hall by Mr. F. H. Tulloch, Inspector to the Local Government Board, respecting an application by the Corporation to borrow 7,400*l.* for the purposes of water supply, including the construction of works at Knighton and Ashey. The Town Clerk (Mr. C. G. Vincent) stated that the loan was in respect to a scheme for

protecting the present water supply, and the Borough Surveyor (Mr. C. Mathew) explained the plans showing the land to be acquired and the proposed work to be carried out. The inquiry then closed.

LEVEL CROSSINGS AT GRIMSBY.—The Grimsby Corporation Highways Committee discussed, on the 3rd inst., plans submitted by the Borough Surveyor (Mr. H. Gilbert Wyatt) for the construction of a subway at the Cleethorpes-road level crossing, at an estimated cost of 4,150*l.* Exception was taken to the plans because they only provided for pedestrians, and not for vehicular traffic. The Committee finally decided that a vehicular subway would be too expensive at present, and accepted the scheme for recommendation to the Council.

MISCELLANEOUS.

GOOD FRIDAY WEEK.—In consequence of the Easter Holidays, next week we go to press a day earlier than usual. All communications for the Editor must reach him by first post on Wednesday morning, except lists of tenders, which will be received up to 10 a.m. of the same day.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—Mr. Sidney J. Tatchell has transferred his office to 13, Queen Anne's-gate, Westminster, S.W.

HOUSING PROBLEM, WOOLWICH.—A Local Government Board inquiry was opened on Tuesday, last week, at Woolwich Town Hall, by Major C. E. Norton, C.E., with whom was Mr. F. J. Willis, into an application by the Woolwich Borough Council for a provisional order to empower that body to put in force, with reference to certain lands required for erecting lodging-houses for the working classes, and situated on the south side of and adjoining Bostall-hill, Plumstead, the powers of the Land Clauses Act with respect to the purchase and taking of lands otherwise than by agreement. The scheme was opposed. The Town Clerk of Woolwich (Mr. A. B. Bryceson), in stating the case for the Council, said that the estimated population of the borough was 132,070, and the assessable value 722,940*l.* The Borough Council adopted Part III. of the Housing of the Working Classes Act, under which the present application was made, and it was the duty of the Council to provide proper accommodation at a reasonable price, and not to regard such a scheme as a speculation. There was considerable over-crowding in the borough; rents had risen, and, on the decrease of work in the Royal Arsenal after the war, many people had left their houses for apartments in the houses which were empty or in the course of construction, were not suitable for the working classes. The congestion compelled many workmen employed in the borough to live outside. The proposed site was pleasantly situated, and would, when the London County Council's tramway schemes were completed, be easily accessible from Woolwich, though only a mile and a half from the Arsenal. Mr. W. R. Ross, Chairman of the Housing Committee of the Borough Council, gave evidence, and said it was proposed to erect a few houses to let at 5*s.* a week, more at 6*s.* to 10*s.* a week, and a few superior ones at 11*s.* a week. He was cross-examined as to the failure of the houses at the Arsenal, Woolwich, which he ascribed to its inaccessibility. Dr. Sidney Davies, Medical Officer of Health, also gave evidence, and the inquiry was adjourned.

NEW IMPERIAL BUILDINGS.—In the House of Commons, a few days ago, Lord Balcarras informed Mr. Coghlin that the contract for the building of the Victoria and Albert Museum is to be finished in February, 1907. It was impossible to hasten the completion. The foundation-stone was laid, by her late Majesty's desire, at a date considerably earlier than the works could be begun; hence much apparent delay. As regards the Royal College of Science Institute, Mr. Coghlin said that building cannot be ready for occupation before the spring of next year. None of the temporary sheds can be vacated until then at the earliest.

AMERICAN INDUSTRY.—The Friday evening lecture at the Royal Institution on the 7th inst. was delivered by Mr. Alfred Mosely, C.M.G., whose subject was "American Industry." Sir James Crichton Browne was in the chair. Mr. Mosely said his subject was the visit paid by representatives of British trade unions to the United States under his auspices two years ago. He had arranged this visit with the hope of bringing home to our workpeople the enormous industrial progress made by the United States of recent years. Many things had contributed to this development, but, in his opinion, education had had more to do with it than any other single factor. Something, he thought, was radically wrong with our system of education, and although we had spent huge sums of money

on it we had not got commensurate results. We, and especially our workmen, must realise that the old régime had gone, and we must change to meet changed conditions. This, too, was the case in regard to tariffs. However good our policy might have been in the past, we must reconsider our position; and even so there would be no finality, for any alteration we made now might have to be altered again twenty years hence. Mr. Mosely pointed out how close together the masters and the men were in America; the willingness of employers to listen to and pay for ideas originated by their men provided a brain-force that was ever working to improve the methods of manufacture. Moreover, piecework was the order of the day, and the man could rely on the prices not being "cut," the employer seeing that the more his men could turn out the better it was for himself, since the burden of the fixed charges of his business was distributed over a large area.

PROTECTION OF ANCIENT BUILDINGS.—The following memorial has been presented to the Benchers of Gray's Inn by the Society for the Protection of Ancient Buildings:—"We, the undersigned, have learnt with deep regret that the Benchers of Gray's Inn have decided to demolish No. 15, Gray's Inn-square, and we therefore earnestly and humbly beg that the Benchers will spare the building, on the grounds of its exceptional beauty, and the charm which it lends to Field-court, which, with the beautiful wrought-iron gates and other pleasant surroundings, is one of the most picturesque spots in London." About 150 names are appended to the memorial.

MEMORIAL TO DEAN HOLE, ROCHESTER.—The executive committee of the Dean Hole Memorial Fund have commissioned Mr. F. W. Pomeroy to execute in marble a recumbent effigy of the late Dean of Rochester, and, in conjunction with Mr. Hodgson Fowler, Architect to the Dean and Chapter of Rochester, to prepare a design for an altar tomb or base for the figure, to be placed in the cathedral.

BUILDING CLASSES AT LEEDS INSTITUTE.—Several developments in connection with the Technical School of this Institute will come into operation next session, among which will be a new building department, which will offer courses of study covering four sessions each, with the following sub-divisions:—Professional side—(1) architects, (2) surveyors, (3) building clerks, (4) estate and insurance agents. Artisan side—(1) bricklayers, (2) masons, (3) carpenters and joiners, (4) plumbers. Mr. James Neill, the teacher of building construction at the institute, has been appointed head of this department. It is intended to hold a special class in land surveying and levelling during the summer months.

THE VENTILATION OF SEWERS.—On Monday the Works and Highway Committee of the Lewisham Borough Council circulated the following report:—"On November 2 last this Committee submitted to the Borough Council a report from the Borough Surveyor recommending the repeal of the drainage by-law, made by the London County Council on October 30, 1900, under the provisions of section 202 of the Metropolitan Management Act, 1855. This by-law requires that at every dwelling house there shall be fixed in every main drain or other drain immediate communication with any sewer at a point as distant from the building and as near to the sewer as is practicable. The Council approved the Borough Surveyor's report and directed that a copy be forwarded to each of the metropolitan borough councils, with a request to them to state whether they would be willing to co-operate with this Council in requesting the London County Council to take the necessary steps to repeal the by-law. Replies have now been received from the borough councils as follows:—Bethnal Green, Camberwell, Deptford, Finsbury, Hammersmith, and W. Ham. These boroughs are willing to co-operate with this Council; Battersea, Holborn, Lambeth, Poplar, St. Marylebone, and St. Pancras will not co-operate; Bermondsey, Greenwich, Hampstead, Paddington, St. George's, Southwark, and Wandsworth have not taken any action; Hackney and Kensington are of opinion that a conference should be called to consider the question. Sir John Greenwell, Islington, Shoreditch, and St. Newington have not replied up to the present time. The Committee have directed that a copy of the Borough Surveyor's report be forwarded to the London County Council with a request that they will at once take the necessary steps to repeal the by-law, and that the borough councils who have expressed their willingness to co-operate be asked to communicate with the London County Council in support."

IMPROVEMENTS, HERFORD.—Mr. W. O. E. Meade-King, Local Government Board Inspector, recently held an inquiry at the

Hereford Town Hall, to inquire into the application of the Hereford Town Council for power to borrow £3,000, to defray expenditure in the use of the moneys already authorised to be borrowed for the provision of municipal buildings. Amongst those present were Messrs. J. Fisher (surveyor), and H. A. Cheers (architect). A decision was made up of small items to be asked for, but there were two rather heavy charges amounting to 1,611l. 13s. 5d., which were covered by finding that the ground of the site of the new building was faulty. At the rear of the site was discovered an old moat, supposed to be the earliest blockade of the city. In consequence of this the foundation had to be raised, approximately, 20 ft. lower than was originally provided for. This was at the rear of the building. In the front was some cellarage, which it was originally intended to cover over, but the ground having been found faulty behind, it was thought best to utilise the space as a basement, and the walls were accordingly carried out.

THE INTERNATIONAL SOCIETY OF SCULPTORS, PAINTERS, AND GRAVERS.—The International Society of Sculptors, Painters, and Gravers, having been invited by the Manchester authorities to transfer their late exhibition to the City Art Gallery, have done so, and the exhibition was just been formally opened by the Lord Mayor. The Society has also received and accepted invitations from Burnley and Bradford, to which places the exhibition will be transferred at the close of the Manchester show.

CAPITAL AND LABOUR.

THE BUILDING TRADE, SUNDERLAND.—The bricklayers, masons, and plasterers of Sunderland have received from the masters notices of a reduction of a penny per hour in the wages and of certain alterations in the working hours and conditions. At present the hours vary from five per week in summer to forty-one at a half in winter. The men on Wearside state that they are determined to resist the notices, which will expire on May 26. The employers give bad trade as the reason of their action. The number of union men who will be affected at Sunderland is about 540. Similar notices have been given in the building trade in the Tyne and other districts. The employers are federated over the whole of the north-east district, but the men are guided by their separate local societies.

ABERDEEN PAINTERS' STRIKE.—The dispute in the painting trade at Aberdeen has been settled, and Mr. J. B. Davidson has, on behalf of the Master Painters' Association, furnished the following official statement as to the settlement. The position now is:—The men have given up their claim for an extra 4d. per hour; they have departed from the demand for an extra 1s. for country money, and they have agreed that the radius should be one and a half miles as formerly. They have also given up on the question of time and half from 5 p.m. to 6 a.m., while the employers have departed from the alterations they desired in the same rule. The parties have agreed to refer to the Conciliation Board the question of the date of the expiry of the by-laws as between January 31 (which the masters have declared their willingness to accept), and February 28, as at present. The rule as to the employment of labourers will now read:—"Labourers shall not be employed by any employer in either doing painting, systematic glazing, or preparing work. It is understood that labourers shall not be prevented from handling or carrying glass, where expert labour is not necessary." The parties have also agreed that, in future, a conference shall be held before the expiry of the by-laws for the purpose of coming to an amicable settlement of any differences, of which notice may have been given. Although the dispute has been settled, there is still a point to be considered in reference to the working together of union and non-union men.

GLASGOW JOINERS' WAGES.—As the result of a proposal by employers to reduce the wages of house joiners in Glasgow by 1d. per hour, and to make certain alterations as to hours of work and other matters, the men have, it is stated, practically intimated their intention to strike work.

for use in floors, pavements, walls, and for other like building or decorative purposes. According to the said invention, white Portland cement is employed in combination with various kinds of spar obtained from the numerous lead mines at home and abroad. The ingredient substances are finely-ground sand, whilst in a plastic state are thoroughly intermixed and incorporated in proportions suitable for the production of the desired colour effect. The plastic mixture then undergoes the setting and consolidating process, whereby the surface of the tile in its finished state is adapted to resist heavy weights or strains, and to prevent, therefore, the production of any damaging or deteriorating effect in the glaze or colour of the tile. The glaze is produced by the use of an iron plough or hand bar, followed by the use of a specially-prepared bar or plough having a polished face.

10,531 of 1904.—J. O. BUCHANAN: *Automatic Sash-locking Apparatus.*

An automatic sash-locking apparatus, consisting in the combination of a case or frame secured to one sash, a carriage sliding in said case, with means for returning the carriage to its normal position, a locking bolt carried by, but capable of moving independently of, and in a direction different from, said carriage, with means for returning the locking bolt to its normal position, a "keeper" secured to the other sash or equivalent, and a recess formed in said "keeper" to receive the locking bolt.

10,866 of 1904.—W. LEOPARD: *Fastenings for Windows, and the like.*

A method of fastening windows, and the like, consisting in the combination of a slotted tongue provided with an adjustable screw to increase the leverage thereof, a bracket in which the said tongue is hinged and bears against a spring-plate mounted therein, operating in conjunction with a pivotally-mounted locking arm, provided with a nose portion, or a turn button with a curved edge.

10,873 of 1904.—Dr. A. VOELKER: *Heating by Electricity.*

This invention consists in a method of manufacturing an electric incandescent body by reducing carbonaceous material to particles or grains, of from 1 to 7 millimeters in diameter, and then dividing the material into main groups, of which the first consists, for example, only of grains of 1 millimeter diameter, the second of grains of 2 millimeters diameter, and so on, each of these groups, for the purpose of obtaining a highly-graduated series of sub-groups, being varied by the addition of substances which increase or diminish the conductivity of the group.

10,975 of 1904.—J. COOPER: *Ball or Float, and Similar Valves.*

This invention relates to ball or float, and similar valves, and particularly to those used in connection with water-closet cisterns, and has for its object to provide means for preventing sticking or fouling of the valve by fur or particles of solder, lead, or other foreign matter which may, during fitting, repairing, or otherwise, get into the service pipes. According to this invention the opening or passage from the supply pipe to the valve is reduced or constricted and adapted to constitute a trap, and the valve is made of less diameter than its surrounding casing, and slides therein on a number (preferably three) of projecting bearing surfaces. According to a modification, the outlet end of the supply pipe is closed by a diaphragm, having a reduced outlet or passage leading to the valve which is seated against the outer end thereof and the inner end of the reduced outlet is extended back into the supply pipe or otherwise formed to constitute a trap.

17,634 of 1904.—T. H. NEALE: *Window-fastening Device for Sash Windows.*

A window-fastening device for sash windows, consisting essentially in pivoting a swivelling catch fastener upon the meeting rail of the lower sash, the said fastener taking into holes in a rack secured to the upper sash, the catch and operating bolts extending to and carrying and operating the pulley styles, a locking screw passing through the meeting rail on the lower sash and abutting against the rack on the upper sash, with or without a padlock for securing the tail of the catch to the locking screw.

25,120 of 1904.—C. M. WHITE (J. A. Wilkinson): *Construction of Furniture.*

This consists in the construction of furniture by means of screws or bolts, and consists in the employment of spring-pressure plates which are brought into close contact with or compressed upon the wood, when the screws are screwed down, said plates thereby exercising a powerful tension or pressure on the connected parts, with the result that said parts remain in

a lasting and close contact even when the joint has been loosened in consequence of the shrinking of the wood or of some other alteration in the shape of the wooden parts.

25,121 of 1904.—C. M. WHITE (J. A. Wilkinson): *Chairs and Similar Articles of Furniture.*

Chairs and like articles of furniture arranged to be swung sideways and provided with folding seats and with only two legs carrying the chair back and the seat, the said chairs being characterised by the fact that one of the legs is inserted rotatably in a socket secured to the floor so that the chair or other piece of furniture can turn on this leg and be swung sideways out of its position of use.

25,122 of 1904.—C. M. WHITE (J. A. Wilkinson): *Manufacture of Solid Bent Wooden Parts.*

A method for the production of solid bent wooden parts, characterised by the fact that the wooden parts which are to be bent are provided either on their whole length or only at the bending places with a covering or sheathing, consisting of a metallic tube tightly fitting the cross-sectional shape of the wooden parts whereupon they are submitted together with these metallic coverings to the bending operations.

25,123 of 1904.—C. M. WHITE (J. A. Wilkinson): *Barbers' Chairs, and like Articles of Furniture.*

An adjustable tilting chair intended to be used as barbers' chair, or for dental or surgical purposes, and the like, characterised by the fact that the back of the same is rigidly connected with a feet-restboard, and, together with the same can be swung round a pintle-joint secured to the seat frame which holds the immovable seat so that the chair back is tilted rearward, the feet-restboard is simultaneously swung upward and vice versa.

1,144 of 1905.—H. JOHNS: *Gates.*

This invention relates to gates, and has for its object to strengthen the top bar. The advantage of this invention is that, while the top or top bar is made the same thickness as the under bars, one is enabled to simplify the method of bracing or making the gates, by bolting on each side the various wood slats or braces instead of mortising the ends into the uprights. By the invention the otherwise weak top bar is strengthened by means of flanged metal pieces.

7,392 of 1904.—G. H. DUNLOP: *Method and Machinery for Excavating and Conveying Earth and other Materials.*

The method for excavating earth and other materials, consisting in hauling a scoop by a draft line from a tractor and controlling it from the tractor by means of double flexible controlling lines, together with a strut and operating mechanism by which double flexible controlling lines strut and operating mechanism the scoop can be tilted forward and backward and be held tilted as may be necessary whereby earth and other material can be filled into the scoop conveyed in it and dumped from it.

27,198 of 1904.—J. Y. JOHNSON (The Simplex Concrete Piling Company): *Construction of Concrete Piles and in Preparatory Piles to be Used Therefor.*

A method of forming concrete piles, the said mode consisting in the combination of a hollow preparatory pile with valve members normally closing its lower end, driving the said pile into the ground, then withdrawing the same with its valve members, and, as it is being withdrawn, introducing concrete through it into the opening which it has formed, the said concrete escaping between the open valve members at the bottom of the pile.

27,300 of 1904.—F. WISSMANN: *Sieves or Screens.*

A flat sieve for separating granular material, ores, and the like, consisting in the combination of a perforated table held in a frame composed of longitudinal bars fixed below said table with longitudinal elastic bars fixed to said cross-stays, and having their ends freely projecting beyond the first and last cross-stay, and steel shoes at the upper ends of said bars.

27,885 of 1904.—S. W. TRAYLOR: *Rotary Screens for Minerals and other Substances.*

A screening apparatus of the class in which a concave screen rotates about a vertical axis and the material under centrifugal force moves from the centre to discharge the oversize over the outer edge characterised by the fact that the said screen is vibrated vertically and only its upward movement is arrested by impact whereby the material will be projected upwardly from the screen surface and moved towards the periphery in a series of bounds, thus enabling the meshes to free from clogging and undue abrasion.

PATENTS OF THE WEEK

APPLICATIONS PUBLISHED.*

6,601 of 1904.—S. McFARLANE: *Manufacture of Tiles.*

This invention relates to a process for the manufacture by hand, in various colours and designs, of glazed semi-marble tiles suitable

*All these applications are in the stage in which application to the grant of Patents upon them can be made.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

April 3.—By R. STAFFORD CHARLES.
Holloway.—Stock Orchard-st., l.g.r. 191. 10s.,
u.t. 37 yrs., g.r. 41.

By DUNN, SOAR, & COVERDALE.
Waltham Cross.—Eleanor-rd., f., w.r. 22. 2s.

By WILLIAM HUGHES.
Waltham Cross.—181, Wood-st. (s.), with timber
yard, etc., in rear, f., p.

By MULLETT, HOOKER, & CO.
Hyde Park.—2, Chester-pl., u.t. 234 yrs., g.r.
21.

Cambridge-ter., etc., l.g.r. 301, u.t. 274 yrs.,
g.r. 104.

Paddington.—Furness-st., l.g.r. 301, u.t. 574
yrs., g.r. 21.

St. John's Wood.—Finchley-rd., l.g.r. 301,
u.t. 324 yrs., g.r. 11. 6s. 10d.

Marlybone.—Balcombe-st., l.g.r. 241, u.t. 154
yrs., g.r. nil.

By A. B. RICHARDSON.
Cannonbury.—St. Paul's-rd., l.g.r. 451. 5s., u.t.
21 yrs., g.r. 101 (with reversion).

By PROTEROE & MORRIS (at Stratford).
Forest Gate.—64 and 66, Kitchener-rd., f.,
w.r. 574. 4s.

Stratford.—124 and 126, Forest-lk., f., y.r. 521.
Marlybone, l.g. rents 201. 10s., reversion in
54 yrs.

Weston-rd., f.g. rents 104, reversion in
54 yrs.

Leytonstone.—18, Cann Hall-rd. (s.), u.t. 574
yrs., g.r. 41, w.r. 521. 10s.

6 and 7, Connaught-rd., u.t. 914 yrs., g.r.
84. 8s., w.r. 621. 8s.

April 4.—By DEBENHAM, TAYSON, & CO.
Old Ford.—251 to 259 (odd), Old Ford-rd.
(s.), area 7,850 ft., f., w.r. 1501. 16s.,
4, 6s. 6d. and 70, Ford-st., f., w.r. 911.

By H. HOLMES & CO.
Marlybone.—17, Backingham-st., u.t. 61 yrs.,
g.r. 361, w.r. 1331. 18s.

41, Bolsover-st., u.t. 104 yrs., g.r. 361, y.r.
1001.

By MATTHEWS, MATTHEWS, & GOODMAN (at
York).
Gillmoors, Yorks.—"Paddell Rigg Farm,"
120 a. 2 r. 21 p. f. and c. p.

April 5.—By GEORGE BRINLEY & SONS.
Eastcott, Middlesex.—Cottin-lk., an en-
closure of freehold meadow land,
4 a. 2 r. 37 p.

By CARTWRIGHT & ETOCHES.
Batham.—Batham-gr., l.g. rents 201, reversion
in 744 yrs.

75, Louville-rd., u.t. 854 yrs., g.r. 61. 10s.,
y.r. 421.

By FOSTER & CRANFIELD.
Kennington.—Brompton-sq., l.g. rents 201,
reversion in 8 yrs.

By HORNLOWER & FLOWER.
Sutton, Surrey.—Thicket-rd., a plot of free-
hold land

By HUNTER & HUNTER.
Stoke Newington.—20 and 20A, Newington-
green (building site), area 5,000 ft., f.

By THURGOOD & CO.
Chiswick.—18, Hawstead-rd., u.t. 76 yrs., g.r.
54, y.r. 241.

Battersea.—71, Plough-rd. (s.), f., a.r. 451.

April 6.—By BIRLEY & SONS.
Bromley.—35, 37, and 39, Alexis-st., u.t.
20 yrs., g.r. 131, w.r. 914.

123 to 133 (odd), St. James-rd., u.t. 284
yrs., g.r. 211, w.r. 2101.

1 to 11, Willow-st., u.t. 174 yrs., g.r. 221,
y.r. 361.

Peckham.—45, Evelina-rd., u.t. 61 yrs., g.r. 61,
w.r. 391.

Rochester.—4, Woodcock-st., u.t. 68 yrs.,
g.r. 61, w.r. 361. 8s.

By W. A. HEAD.
Deptford.—54, Wellington-st. (s.), l., a.r. 231.
Brooklyn.—3, Zetland-villas, f., y.r. 341.

Norwood.—73, 81, and 83, Golden-rd., f., w.r.
721.

By CECIL HORDAY.
Putney.—33, Carlton-rd., u.t. 594 yrs., g.r.,
etc., 201. 4s. p.

Battersea.—68, 70, 72 to 82 (even), Home-rd.,
u.t. 72 yrs., g.r. 281, w.r. 1761. 16s.

45 to 61, 69 to 67 (odd), Home-rd., u.t. 72
yrs., g.r. 441, w.r. 2001.

18, Castle-st., u.t. 72 yrs., g.r. 54, w.r.
311. 4s.

30 and 32, Goulden-st., u.t. 72 yrs., g.r. 101,
w.r. 591. 16s.

Wandsworth.—39 to 42 (even), 88 and 90,
Ferrier-st., u.t. 72 yrs., g.r. 221, w.r.
1711. 12s.

Fulham.—2 to 6 (even), Bayley-lk., u.t. 794
yrs., g.r. 161. 8s., w.r. 1451. 12s.

Peckham.—1 to 5, Hawkin-villas, u.t. 84 yrs.,
g.r. 301, w.r. 1601.

Battersea.—19, Stamford-st. (s.), u.t. 694 yrs.,
g.r. 101. Increasing to 121, y.r. 531.

5, 7, and 9, Brougham-st., u.t. 544 yrs.,
g.r. 61, w.r. 801. 16s.

Stoke Newington.—42, Midway-rd., u.t. 464
yrs., g.r. 61. 10s., w.r. 911.

Haggerston.—Whiston-st., etc., l.g.r. 121,
reversion in 21 yrs.

By WILLIAM HUGHES.
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120 a. 2 r. 21 p. f. and c. p.

April 5.—By GEORGE BRINLEY & SONS.
Eastcott, Middlesex.—Cottin-lk., an en-
closure of freehold meadow land,
4 a. 2 r. 37 p.

By CARTWRIGHT & ETOCHES.
Batham.—Batham-gr., l.g. rents 201, reversion
in 744 yrs.

75, Louville-rd., u.t. 854 yrs., g.r. 61. 10s.,
y.r. 421.

By FOSTER & CRANFIELD.
Kennington.—Brompton-sq., l.g. rents 201,
reversion in 8 yrs.

By HORNLOWER & FLOWER.
Sutton, Surrey.—Thicket-rd., a plot of free-
hold land

By HUNTER & HUNTER.
Stoke Newington.—20 and 20A, Newington-
green (building site), area 5,000 ft., f.

By THURGOOD & CO.
Chiswick.—18, Hawstead-rd., u.t. 76 yrs., g.r.
54, y.r. 241.

Battersea.—71, Plough-rd. (s.), f., a.r. 451.

April 6.—By BIRLEY & SONS.
Bromley.—35, 37, and 39, Alexis-st., u.t.
20 yrs., g.r. 131, w.r. 914.

123 to 133 (odd), St. James-rd., u.t. 284
yrs., g.r. 211, w.r. 2101.

1 to 11, Willow-st., u.t. 174 yrs., g.r. 221,
y.r. 361.

Peckham.—45, Evelina-rd., u.t. 61 yrs., g.r. 61,
w.r. 391.

Rochester.—4, Woodcock-st., u.t. 68 yrs.,
g.r. 61, w.r. 361. 8s.

By W. A. HEAD.
Deptford.—54, Wellington-st. (s.), l., a.r. 231.
Brooklyn.—3, Zetland-villas, f., y.r. 341.

Norwood.—73, 81, and 83, Golden-rd., f., w.r.
721.

By CECIL HORDAY.
Putney.—33, Carlton-rd., u.t. 594 yrs., g.r.,
etc., 201. 4s. p.

Battersea.—68, 70, 72 to 82 (even), Home-rd.,
u.t. 72 yrs., g.r. 281, w.r. 1761. 16s.

45 to 61, 69 to 67 (odd), Home-rd., u.t. 72
yrs., g.r. 441, w.r. 2001.

18, Castle-st., u.t. 72 yrs., g.r. 54, w.r.
311. 4s.

30 and 32, Goulden-st., u.t. 72 yrs., g.r. 101,
w.r. 591. 16s.

Wandsworth.—39 to 42 (even), 88 and 90,
Ferrier-st., u.t. 72 yrs., g.r. 221, w.r.
1711. 12s.

Fulham.—2 to 6 (even), Bayley-lk., u.t. 794
yrs., g.r. 161. 8s., w.r. 1451. 12s.

Peckham.—1 to 5, Hawkin-villas, u.t. 84 yrs.,
g.r. 301, w.r. 1601.

Battersea.—19, Stamford-st. (s.), u.t. 694 yrs.,
g.r. 101. Increasing to 121, y.r. 531.

5, 7, and 9, Brougham-st., u.t. 544 yrs.,
g.r. 61, w.r. 801. 16s.

Stoke Newington.—42, Midway-rd., u.t. 464
yrs., g.r. 61. 10s., w.r. 911.

Haggerston.—Whiston-st., etc., l.g.r. 121,
reversion in 21 yrs.

MEETINGS.

FRIDAY, APRIL 14.

Royal Institution.—Right Hon. Lord Rayleigh on
"The Law of Pressure of Gases below Atmosphere."

9 p.m.
Institution of Mechanical Engineers.—(1) The Presi-
dent, Mr. E. P. Martin, will deliver an address (2)
The Discussion will be concluded on the Steam-engine
Research Report, and Professor Capper will reply. 8 p.m.

SATURDAY, APRIL 15.

Royal Institution.—Right Hon. Lord Rayleigh on
"Some Controversial Questions of Optics," III. 3 p.m.

Architectural Association.—Seventh Spring Visit,
to the Hammer-mith Free Library, near Town Hall, by
permission of Mr. H. T. Hare, the architect.

Royal Sanitary Institute (Arts Theatre, University
of Liverpool).—Discussion on "Recent Methods of
Rehousing Tenants Dispossessed from Insanitary
Property." To be opened by Mr. F. T. Turton, Deputy
Surveyor, Liverpool Corporation. 11 a.m.

MONDAY, APRIL 17.

Royal Institute of British Architects.—Twelfth General
Meeting (Ordinary). Mr. Mervyn Macartney on "Garden
Architecture," illustrated by lantern views. 8 p.m.

TUESDAY, APRIL 18.

Institution of Civil Engineers.—Annual General
Meeting of Corporate Members only, to receive the
Report of the Council, and to elect the Council and
Auditors for the ensuing year. 8 p.m.

WEDNESDAY, APRIL 19.

Edinburgh Architectural Association.—Annual Business
Meeting and President's Valedictory Address. 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—
Ordinary Meeting of the Members. 8 p.m.

Institute of Sanitary Engineers, Ltd.—Examination
and Literary Committee at 8 o'clock. Finance Com-
mittee at 8 o'clock. Special Council Meeting at 8 o'clock.
Sessional Meeting at 7 o'clock; Paper by Mr. E. R.
Palmer (Fellow), on "The Ventilating, Flushing, and
Cleansing of Sewers and Drains."

APRIL 20 TO 25.

Architectural Association Camera and Cycling Club.—
Easter Excursion: Hereford, etc.

SATURDAY, APRIL 22.

Edinburgh Architectural Association.—Visit to Drum
House, Gilmerton.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters,
and papers read at meetings rests, of course, with the
authors.

We cannot undertake to return rejected communica-
tions, and the Editor cannot be responsible for
drawings, photographs, manuscripts, or other docu-
ments, or for models or samples, sent to or left at this
office, unless he has specially asked for them.

Letters or communications (beyond mere news items)
which have been duplicated for other journals are NOT
DESIRED.

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name and address of the sender, whether for publica-
tion or not. No notice can be taken of anonymous
communications.

We are compelled to decline pointing out books and
journals.

Any communication to a contributor to write an article,
to execute or leave for publication, is given
subject to the approval of the article or drawing, when
received, by the Editor, who retains the right to reject it
if unsatisfactory. The receipt by the author of a
proof of an article in type does not necessarily imply its
acceptance.

All communications regarding literary and artistic
matters should be addressed to THE EDITOR; those
relating to engineering and other technical business
matters should be addressed to THE PUBLISHER,
and not to the Editor.

PRICES CURRENT OF MATERIALS.

* * Our aim in this list is to give, as far as possible, the
average prices of materials, not necessarily the lowest.
Quality and quantity obviously affect prices—a fact
which should be remembered by those who make use of
this information.

BRICKS, &c.

Hard Sticks, 1 10 0 per 1000 alongside, in river.

Grizzles, 1 6 0 " " " "

Facing Sticks, 2 2 0 " " " "

Shippers, 2 2 0 " " " "

Flintons, 1 7 0 " " " "

Red Wire Cuts, 1 14 0 " " " "

Best Fareham Bed, 3 12 0 " " " "

Best Bed Pressed, " " " "

Best Blue Pressed, " " " "

Best Blue Pressed, " " " "

Stamfordshire, 4 2 6 " " " "

Do. Bulnose, 4 7 6 " " " "

Best Stourbridge, " " " "

Fire Bricks, 4 0 0 " " " "

GLAZED BRICKS, " " " "

Best White and, " " " "

Ivory Glazed, " " " "

Stretchers, 12 0 0 " " " "

Headers, 11 0 0 " " " "

Quoins, Bullnose, " " " "

and Flats, " " " "

Double Stretchers, 19 0 0 " " " "

Double Headers, 16 0 0 " " " "

One Side and two, " " " "

Ends, " " " "

Two Sides and, " " " "

one End, " " " "

Splays, Cham- " " " "

ferre, Square, " " " "

Best Dipped Salt, " " " "

Glazed Stretch- " " " "

ers, and Header 12 0 0 " " " "

Quoins, Bullnose, " " " "

and Flats, " " " "

Double Stretchers 15 0 0 " " " "

BRICKS, &c. (continued).

Double Headers, 14 8 d. per 1000 at railway dep.

One Side and two, " " " "

Ends, " " " "

Two Sides and, " " " "

one End, " " " "

Splays, Cham- " " " "

ferre, Squints 14 0 0 " " " "

Second Quality, " " " "

White and, " " " "

Dipped Salt, " " " "

Glazed, 2 0 0 " " " "

Thames and Pit Sand, 7 0 per yard, delivered.

Thames Ballast, " " " "

Best Portland Cement, 37 0 per ton, " "

Best Ground Blue Lias Lime 20 0 " " "

NOTE.—The cement or lime is exclusive of the ordinary
charge for sacks.

Grey Stone Lime, " " " "

Stourbridge Fireclay in sacks 27s. 6d. per ton at riv. dep.

STONE.

BATH STONE—delivered on road wag- " " " "

gons, Paddington Dept. 1 6 per ft. cube.

Do. do. delivered on road wagons, " " " "

Nine Elms Depot 1 8 " " "

PORTLAND STONE (30 ft. average)— " " " "

Brown Whitbed, delivered on road " " " "

wagons, Paddington Dept. 2 1 " " "

White Baselid, delivered on road " " " "

WOOD (continued).

	At per standard.	At per standard.
£ s. d.	£ s. d.	£ s. d.
10 0 less than best.		
0 10 0 "		
0 0 0 "		
1 in. by 4 in. and 2 in. by 7 in.	8 10 0	9 10 0
2 in. by 4 in. and 2 in. by 7 in.	8 10 0	9 10 0
1 in. and 1 1/2 in. by 7 in.	0 10 0	more than batens.
1 1/2 in. by 7 in.	1 0 0	
At per load of 50 ft.		
For timber: best midding Danzig	4 10 0	5 0 0
Second (average specification)	4 0 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Small timber (8 in. to 8 in.)	3 0 0	3 10 0
Small timber (8 in. to 8 in.)	2 10 0	3 0 0
Swedish larch (30 ft. average)	8 5 0	8 15 0
Swedish timber (30 ft. average)	8 5 0	8 15 0

Joists' Wood. At per standard.

£ s. d.	£ s. d.	£ s. d.
1 in. by 11 in.	24 0 0	25 0 0
2 in. by 9 in.	22 0 0	23 0 0
3 in. by 7 in.	16 10 0	18 0 0
4 in. by 5 in.	13 10 0	14 10 0
5 in. by 4 in.	12 10 0	13 0 0
6 in. by 3 in.	11 10 0	12 0 0
7 in. by 2 in.	10 10 0	11 0 0
8 in. by 1 in.	9 10 0	10 0 0
9 in. by 1 in.	8 10 0	9 0 0
10 in. by 1 in.	7 10 0	8 0 0
11 in. by 1 in.	6 10 0	7 0 0
12 in. by 1 in.	5 10 0	6 0 0
13 in. by 1 in.	4 10 0	5 0 0
14 in. by 1 in.	3 10 0	4 0 0
15 in. by 1 in.	2 10 0	3 0 0
16 in. by 1 in.	1 10 0	2 0 0
17 in. by 1 in.	0 10 0	1 0 0
18 in. by 1 in.	0 10 0	1 0 0
19 in. by 1 in.	0 10 0	1 0 0
20 in. by 1 in.	0 10 0	1 0 0

Timber: first yellow deals.

£ s. d.	£ s. d.	£ s. d.
3 in. by 9 in.	21 0 0	22 10 0
4 in. by 7 in.	20 0 0	21 10 0
5 in. by 5 in.	19 0 0	20 10 0
6 in. by 4 in.	18 0 0	19 10 0
7 in. by 3 in.	17 0 0	18 10 0
8 in. by 2 in.	16 0 0	17 10 0
9 in. by 1 in.	15 0 0	16 10 0
10 in. by 1 in.	14 0 0	15 10 0
11 in. by 1 in.	13 0 0	14 10 0
12 in. by 1 in.	12 0 0	13 10 0
13 in. by 1 in.	11 0 0	12 10 0
14 in. by 1 in.	10 0 0	11 10 0
15 in. by 1 in.	9 0 0	10 10 0
16 in. by 1 in.	8 0 0	9 10 0
17 in. by 1 in.	7 0 0	8 10 0
18 in. by 1 in.	6 0 0	7 10 0
19 in. by 1 in.	5 0 0	6 10 0
20 in. by 1 in.	4 0 0	5 10 0

Timber: second yellow deals.

£ s. d.	£ s. d.	£ s. d.
3 in. by 9 in.	20 0 0	21 10 0
4 in. by 7 in.	19 0 0	20 10 0
5 in. by 5 in.	18 0 0	19 10 0
6 in. by 4 in.	17 0 0	18 10 0
7 in. by 3 in.	16 0 0	17 10 0
8 in. by 2 in.	15 0 0	16 10 0
9 in. by 1 in.	14 0 0	15 10 0
10 in. by 1 in.	13 0 0	14 10 0
11 in. by 1 in.	12 0 0	13 10 0
12 in. by 1 in.	11 0 0	12 10 0
13 in. by 1 in.	10 0 0	11 10 0
14 in. by 1 in.	9 0 0	10 10 0
15 in. by 1 in.	8 0 0	9 10 0
16 in. by 1 in.	7 0 0	8 10 0
17 in. by 1 in.	6 0 0	7 10 0
18 in. by 1 in.	5 0 0	6 10 0
19 in. by 1 in.	4 0 0	5 10 0
20 in. by 1 in.	3 0 0	4 10 0

Timber: third yellow deals.

£ s. d.	£ s. d.	£ s. d.
3 in. by 9 in.	19 0 0	20 10 0
4 in. by 7 in.	18 0 0	19 10 0
5 in. by 5 in.	17 0 0	18 10 0
6 in. by 4 in.	16 0 0	17 10 0
7 in. by 3 in.	15 0 0	16 10 0
8 in. by 2 in.	14 0 0	15 10 0
9 in. by 1 in.	13 0 0	14 10 0
10 in. by 1 in.	12 0 0	13 10 0
11 in. by 1 in.	11 0 0	12 10 0
12 in. by 1 in.	10 0 0	11 10 0
13 in. by 1 in.	9 0 0	10 10 0
14 in. by 1 in.	8 0 0	9 10 0
15 in. by 1 in.	7 0 0	8 10 0
16 in. by 1 in.	6 0 0	7 10 0
17 in. by 1 in.	5 0 0	6 10 0
18 in. by 1 in.	4 0 0	5 10 0
19 in. by 1 in.	3 0 0	4 10 0
20 in. by 1 in.	2 0 0	3 10 0

Timber: fourth yellow deals.

£ s. d.	£ s. d.	£ s. d.
3 in. by 9 in.	18 0 0	19 10 0
4 in. by 7 in.	17 0 0	18 10 0
5 in. by 5 in.	16 0 0	17 10 0
6 in. by 4 in.	15 0 0	16 10 0
7 in. by 3 in.	14 0 0	15 10 0
8 in. by 2 in.	13 0 0	14 10 0
9 in. by 1 in.	12 0 0	13 10 0
10 in. by 1 in.	11 0 0	12 10 0
11 in. by 1 in.	10 0 0	11 10 0
12 in. by 1 in.	9 0 0	10 10 0
13 in. by 1 in.	8 0 0	9 10 0
14 in. by 1 in.	7 0 0	8 10 0
15 in. by 1 in.	6 0 0	7 10 0
16 in. by 1 in.	5 0 0	6 10 0
17 in. by 1 in.	4 0 0	5 10 0
18 in. by 1 in.	3 0 0	4 10 0
19 in. by 1 in.	2 0 0	3 10 0
20 in. by 1 in.	1 0 0	2 10 0

Timber: fifth yellow deals.

£ s. d.	£ s. d.	£ s. d.
3 in. by 9 in.	17 0 0	18 10 0
4 in. by 7 in.	16 0 0	17 10 0
5 in. by 5 in.	15 0 0	16 10 0
6 in. by 4 in.	14 0 0	15 10 0
7 in. by 3 in.	13 0 0	14 10 0
8 in. by 2 in.	12 0 0	13 10 0
9 in. by 1 in.	11 0 0	12 10 0
10 in. by 1 in.	10 0 0	11 10 0
11 in. by 1 in.	9 0 0	10 10 0
12 in. by 1 in.	8 0 0	9 10 0
13 in. by 1 in.	7 0 0	8 10 0
14 in. by 1 in.	6 0 0	7 10 0
15 in. by 1 in.	5 0 0	6 10 0
16 in. by 1 in.	4 0 0	5 10 0
17 in. by 1 in.	3 0 0	4 10 0
18 in. by 1 in.	2 0 0	3 10 0
19 in. by 1 in.	1 0 0	2 10 0
20 in. by 1 in.	0 10 0	1 10 0

Timber: sixth yellow deals.

£ s. d.	£ s. d.	£ s. d.
3 in. by 9 in.	16 0 0	17 10 0
4 in. by 7 in.	15 0 0	16 10 0
5 in. by 5 in.	14 0 0	15 10 0
6 in. by 4 in.	13 0 0	14 10 0
7 in. by 3 in.	12 0 0	13 10 0
8 in. by 2 in.	11 0 0	12 10 0
9 in. by 1 in.	10 0 0	11 10 0
10 in. by 1 in.	9 0 0	10 10 0
11 in. by 1 in.	8 0 0	9 10 0
12 in. by 1 in.	7 0 0	8 10 0
13 in. by 1 in.	6 0 0	7 10 0
14 in. by 1 in.	5 0 0	6 10 0
15 in. by 1 in.	4 0 0	5 10 0
16 in. by 1 in.	3 0 0	4 10 0
17 in. by 1 in.	2 0 0	3 10 0
18 in. by 1 in.	1 0 0	2 10 0
19 in. by 1 in.	0 10 0	1 10 0
20 in. by 1 in.	0 0 0	0 10 0

Timber: seventh yellow deals.

£ s. d.	£ s. d.	£ s. d.
3 in. by 9 in.	15 0 0	16 10 0
4 in. by 7 in.	14 0 0	15 10 0
5 in. by 5 in.	13 0 0	14 10 0
6 in. by 4 in.	12 0 0	13 10 0
7 in. by 3 in.	11 0 0	12 10 0
8 in. by 2 in.	10 0 0	11 10 0
9 in. by 1 in.	9 0 0	10 10 0
10 in. by 1 in.	8 0 0	9 10 0
11 in. by 1 in.	7 0 0	8 10 0
12 in. by 1 in.	6 0 0	7 10 0
13 in. by 1 in.	5 0 0	6 10 0
14 in. by 1 in.	4 0 0	5 10 0
15 in. by 1 in.	3 0 0	4 10 0
16 in. by 1 in.	2 0 0	3 10 0
17 in. by 1 in.	1 0 0	2 10 0
18 in. by 1 in.	0 10 0	1 10 0
19 in. by 1 in.	0 0 0	0 10 0
20 in. by 1 in.	0 0 0	0 0 0

METALS (continued).

	Per ton, in London.	£ s. d.
Iron—continued.		
Galvanized Corrugated Sheets—		
Ordinary sizes 8 ft. to 8 ft. 20 g.	12 10 0	13 0 0
" " 22 g. and 24 g.	13 0 0	13 10 0
" " 26 g.	13 15 0	14 0 0
Best Soft Steel Sheets, 8 ft. by 2 ft.	11 0 0	11 10 0
Best Soft Steel Sheets, 22 g. and 24 g.	13 0 0	13 10 0
" " 26 g.	13 10 0	14 0 0
Cut nails, 3 in. to 6 in.	9 0 0	9 10 0
Compo pipe.	18 7 6	18 10 0
(Under 3 in., usual trade extras.)		

LEAD, &c.

	Per ton, in London.	£ s. d.
LEAD—Sheet, English, 3 lb. and up	15 7 6	16 0 0
Pipe in coils	15 7 6	16 0 0
Soil pipe	18 7 6	19 0 0
Compo pipe	18 7 6	19 0 0
ZINC—Sheet—		
Vieille Montagne	30 15 0	31 0 0
Silesian	30 10 0	31 0 0
Copper—		
Strong Sheet—per lb.	0 0 10	0 0 11
Thin	0 0 10	0 0 11
Copper nails	0 0 10	0 0 11
Brass—		
Strong Sheet—per lb.	0 0 0 1/2	0 0 0 1/2
Thin	0 0 0 1/2	0 0 0 1/2
Tray—English Ingots	0 0 0 1/2	0 0 0 1/2
Solder—Plumber's	0 0 0 1/2	0 0 0 1/2
Timmen's	0 0 0 1/2	0 0 0 1/2
Blowpipe	0 0 0 1/2	0 0 0 1/2

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds.....	24d.	per ft. delivered.
21 oz. thirds.....	24d.	24
26 oz. thirds.....	33d.	24
32 oz. thirds.....	38d.	24
36 oz. thirds.....	43d.	24
42 oz. thirds.....	48d.	24
48 oz. thirds.....	53d.	24
54 oz. thirds.....	58d.	24
60 oz. thirds.....	63d.	24
66 oz. thirds.....	68d.	24
72 oz. thirds.....	73d.	24
78 oz. thirds.....	78d.	24
84 oz. thirds.....	83d.	24
90 oz. thirds.....	88d.	24
96 oz. thirds.....	93d.	24
102 oz. thirds.....	98d.	24
108 oz. thirds.....	103d.	24
114 oz. thirds.....	108d.	24
120 oz. thirds.....	113d.	24
126 oz. thirds.....	118d.	24
132 oz. thirds.....	123d.	24
138 oz. thirds.....	128d.	24
144 oz. thirds.....	133d.	24
150 oz. thirds.....	138d.	24
156 oz. thirds.....	143d.	24
162 oz. thirds.....	148d.	24
168 oz. thirds.....	153d.	24
174 oz. thirds.....	158d.	24
180 oz. thirds.....	163d.	24
186 oz. thirds.....	168d.	24
192 oz. thirds.....	173d.	24
198 oz. thirds.....	178d.	24
204 oz. thirds.....	183d.	24
210 oz. thirds.....	188d.	24
216 oz. thirds.....	193d.	24
222 oz. thirds.....	198d.	24
228 oz. thirds.....	203d.	24
234 oz. thirds.....	208d.	24
240 oz. thirds.....	213d.	24
246 oz. thirds.....	218d.	24
252 oz. thirds.....	223d.	24
258 oz. thirds.....	228d.	24
264 oz. thirds.....	233d.	24
270 oz. thirds.....	238d.	24
276 oz. thirds.....	243d.	24
282 oz. thirds.....	248d.	24
288 oz. thirds.....	253d.	24
294 oz. thirds.....	258d.	24
300 oz. thirds.....	263d.	24
306 oz. thirds.....	268d.	24
312 oz. thirds.....	273d.	24
318 oz. thirds.....	278d.	24
324 oz. thirds.....	283d.	24
330 oz. thirds.....	288d.	24
336 oz. thirds.....	293d.	24
342 oz. thirds.....	298d.	24
348 oz. thirds.....	303d.	24
354 oz. thirds.....	308d.	24
360 oz. thirds.....	313d.	24
366 oz. thirds.....	318d.	24
372 oz. thirds.....	323d.	24
378 oz. thirds.....	328d.	24
384 oz. thirds.....	333d.	24
390 oz. thirds.....	338d.	24
396 oz. thirds.....	343d.	24
402 oz. thirds.....	348d.	24
408 oz. thirds.....	353d.	24
414 oz. thirds.....	358d.	24
420 oz. thirds.....	363d.	24
426 oz. thirds.....	368d.	24
432 oz. thirds.....	373d.	24
438 oz. thirds.....	378d.	24
444 oz. thirds.....	383d.	24
450 oz. thirds.....	388d.	24
456 oz. thirds.....	393d.	24
462 oz. thirds.....	398d.	24
468 oz. thirds.....	403d.	24
474 oz. thirds.....	408d.	24
480 oz. thirds.....	413d.	24
486 oz. thirds.....	418d.	24
492 oz. thirds.....	423d.	24
498 oz. thirds.....	428d.	24
504 oz. thirds.....	433d.	24
510 oz. thirds.....	438d.	24
516 oz. thirds.....	443d.	24
522 oz. thirds.....	448d.	24
528 oz. thirds.....	453d.	24
534 oz. thirds.....	458d.	24
540 oz. thirds.....	463d.	24
546 oz. thirds.....	468d.	24
552 oz. thirds.....	473d.	24
558 oz. thirds.....	478d.	24
564 oz. thirds.....	483d.	24
570 oz. thirds.....	488d.	24
576 oz. thirds.....	493d.	24
582 oz. thirds.....	498d.	24
588 oz. thirds.....	503d.	24
594 oz. thirds.....	508d.	24
600 oz. thirds.....	513d.	24
606 oz. thirds.....	518d.	24
612 oz. thirds.....	523d.	24
618 oz. thirds.....	528d.	24
624 oz. thirds.....	533d.	24
630 oz. thirds.....	538d.	24
636 oz. thirds.....	543d.	24
642 oz. thirds.....	548d.	24
648 oz. thirds.....	553d.	24
654 oz. thirds.....	558d.	24
660 oz. thirds.....	563d.	24
666 oz. thirds.....	568d.	24
672 oz. thirds.....	573d.	24
678 oz. thirds.....	578d.	24
684 oz. thirds.....	583d.	24
690 oz. thirds.....	588d.	24
696 oz. thirds.....	593d.	24
702 oz. thirds.....	598d.	24
708 oz. thirds.....	603d.	24
714 oz. thirds.....	608d.	24
720 oz. thirds.....	613d.	24
726 oz. thirds.....	618d.	24
732 oz. thirds.....	623d.	24
738 oz. thirds.....	628d.	24
744 oz. thirds.....	633d.	24
750 oz. thirds.....	638d.	24
756 oz. thirds.....	643d.	24
762 oz. thirds.....	648d.	24
768 oz. thirds.....	653d.	24
774 oz. thirds.....	658d.	24
780 oz. thirds.....	663d.	24
786 oz. thirds.....	668d.	24
792 oz. thirds.....	673d.	24
798 oz. thirds.....	678d.	24
804 oz. thirds.....	683d.	24
810 oz. thirds.....	688d.	24
816 oz. thirds.....	693d.	24
822 oz. thirds.....	698d.	24
828 oz. thirds.....	703d.	24
834 oz. thirds.....	708d.	24
840 oz. thirds.....	713d.	24
846 oz. thirds.....	718d.	24
852 oz. thirds.....	723d.	24
858 oz. thirds.....	728d.	24
864 oz. thirds.....	733d.	24
870 oz. thirds.....	738d.	24
876 oz. thirds.....	743d.	24
882 oz. thirds.....	748d.	24
888 oz. thirds.....	753d.	24
894 oz. thirds.....	758d.	24
900 oz. thirds.....	763d.	24
906 oz. thirds.....	768d.	24
912 oz. thirds.....	773d.	24
918 oz. thirds.....	778d.	24
924 oz. thirds.....	783d.	24
930 oz. thirds.....	788d.	24
936 oz. thirds.....	793d.	24
942 oz. thirds.....	798d.	24
948 oz. thirds.....	803d.	24
954 oz. thirds.....	808d.	24
960 oz. thirds.....	813d.	24
966 oz. thirds.....	818d.	24
972 oz. thirds.....	823d.	24
978 oz. thirds.....	828d.	24
984 oz. thirds.....	833d.	24
990 oz. thirds.....	838d.	24
996 oz. thirds.....	843d.	24
1002 oz. thirds.....	848d.	24
1008 oz. thirds.....	853d.	24
1014 oz. thirds.....	858d.	24
1020 oz. thirds.....	863d.	24
1026 oz. thirds.....	868d.	24
1032 oz. thirds.....	873d.	24
1038 oz. thirds.....	878d.	24
1044 oz. thirds.....	883d.	24
1050 oz. thirds.....	888d.	24
1056 oz. thirds.....	893d.	24
1062 oz. thirds.....	898d.	24
1068 oz. thirds.....	903d.	24
1074 oz. thirds.....	908d.	24
1080 oz. thirds.....	913d.	24
1086 oz. thirds.....	918d.	24
1092 oz. thirds.....	923d.	24
1098 oz. thirds.....	928d.	24
1104 oz. thirds.....	933d.	24
1110 oz. thirds.....	938d.	24
1116 oz. thirds.....	943d.	24
1122 oz. thirds.....	948d.	24
1128 oz. thirds.....	953d.	24
1134 oz. thirds.....	958d.	24
1140 oz. thirds.....	963d.	24
1146 oz. thirds.....	968d.	24
1152 oz. thirds.....	973d.	24
1158 oz. thirds.....	978d.	24
1164 oz. thirds.....	983d.	24
1170 oz. thirds.....	988d.	24
1176 oz. thirds.....	993d.	24
1182 oz. thirds.....	998d.	24
1188 oz. thirds.....	1003d.	24
1194 oz. thirds.....	1008d.	24
1200 oz. thirds.....	1013d.	24
1206 oz. thirds.....	1018d.	24
1212 oz. thirds.....	1023d.	24
1218 oz. thirds.....	1028d.	24
1224 oz. thirds.....	1033d.	24
1230 oz. thirds.....	1038d.	24
1236 oz. thirds.....	1043d.	24
1242 oz. thirds.....	1048d.	24
1248 oz. thirds.....	1053d.	24
1254 oz. thirds.....	1058d.	24
1260 oz. thirds.....	1063d.	24
1266 oz. thirds.....	1068d.	24
1272 oz. thirds.....	1073d.	24
1278 oz. thirds.....	1078d.	24
1284 oz. thirds.....	1083d.	24
1290 oz. thirds.....	1088d.	24
1296 oz. thirds.....	1093d.	24
1302 oz. thirds.....	1098d.	24
1308 oz. thirds.....	1103d.	24
1314 oz. thirds.....	1108d.	24
1320 oz. thirds.....	1113d.	24
1326 oz. thirds.....	1118d.	24
1332 oz. thirds.....	1123d.	24
1338 oz. thirds.....	1128d.	24
1344 oz. thirds.....	1133d.	24
1350 oz. thirds.....	1138d.	24
1356 oz. thirds.....	1143d.	24
1362 oz. thirds.....	1148d.	24
1368 oz. thirds.....	1153d.	24
1374 oz. thirds.....	1158d.	24
1380 oz. thirds.....	1163d.	24
1386 oz. thirds.....	1168d.	24
1392 oz. thirds.....	1173d.	24
1398 oz. thirds.....	1178d.	24
1404 oz. thirds.....	1183d.	24
1410 oz. thirds.....	1188d.	24
1416 oz. thirds.....	1193d.	24
1422 oz. thirds.....	1198d.	24
1428 oz. thirds.....	1203d.	24
1434 oz. thirds.....	1208d.	24
1440 oz. thirds.....	1213d.	24
1446 oz. thirds.....	1218d.	24
1452 oz. thirds.....	1223d.	24
1458 oz. thirds.....	1228d.	24
1464 oz. thirds.....	1233d.	24
1470 oz. thirds.....	1238d.	24
1476 oz. thirds.....	1243d.	24
1482 oz. thirds.....	1248d.	24
1488 oz. thirds.....	1253d.	24
1494 oz. thirds.....	1258d.	24
1500 oz. thirds.....	1263d.	24
1506 oz. thirds.....	1268d.	24
1512 oz. thirds.....	1273d.	24
1518 oz. thirds.....	1278d.	24
1524 oz. thirds.....	1283d.	24
1530 oz. thirds.....	1288d.	24
1536 oz. thirds.....	1293d.	24
1542 oz. thirds.....	1298d.	24
1548 oz. thirds.....	1303d.	24
1554 oz. thirds.....	1308d.	24
1560 oz. thirds.....	1313d.	24
1566 oz. thirds.....	1318d.	24
1572 oz. thirds.....	1323d.	24
1578 oz. thirds.....	1328d.	24
1584 oz. thirds.....	1333d.	24
1590 oz. thirds.....	1338d.	24
1596 oz. thirds.....	1343d.	24
1602 oz. thirds.....	1348d.	24
1608 oz. thirds.....	1353d.	24
1614 oz. thirds.....	1358d.	24
1620 oz. thirds.....	1363d.	24
1626 oz. thirds.....	1368d.	24
1632 oz. thirds.....	1373d.	24
1638 oz. thirds.....	1378d.	24
1644 oz. thirds.....	1383d.	24
1650 oz. thirds.....	1388d.	24
1656 oz. thirds.....	1393d.	24
1662 oz. thirds.....	1398d.	24
1668 oz. thirds.....	1403d.	24
1674 oz. thirds.....	1408d.	24
1680 oz. thirds.....	1413d.	24
1686 oz. thirds.....	1418d.	24
1692 oz. thirds.....	1423d.	24
1698 oz. thirds.....	1428d.	24
1704 oz. thirds.....	1433d.	24
1710 oz. thirds.....	1438d.	24
1716 oz. thirds.....	1443d.	24
1722 oz. thirds.....	1448d.	24
1728 oz. thirds.....	1453d.	24
1734 oz. thirds.....	1458d.	24
1740 oz. thirds.....	1463d.	24
1746 oz. thirds.....	1468d.	24
1752 oz. thirds.....	1473d.	24
1758 oz. thirds.....	1478d.	24
1764 oz. thirds.....	1483d.	24
1770 oz. thirds.....	1488d.	24
1776 oz. thirds.....	1493d.	24
1782 oz. thirds.....	1498d.	24
1788 oz. thirds.....	1503d.	24
1794 oz. thirds.....	1508d.	24
1800 oz. thirds.....	1513d.	24
1806 oz. thirds.....	1518d.	24
1812 oz. thirds.....	1523d.	24
1818 oz. thirds.....	1528d.	24
1824 oz. thirds.....	1533d.	24
1830 oz. thirds.....	1538d.	24
1836 oz. thirds.....	1543d.	24
1842 oz. thirds.....	1548d.	24
1848 oz. thirds.....	1553d.	24
1854 oz. thirds.....	1558d.	24
1860 oz. thirds.....	1563d.	24
1866 oz. thirds.....	1568d.	24
1872 oz. thirds.....	1573d.	24
1878 oz. thirds.....	1578d.	24
1884 oz. thirds.....	1583d.	24
1890 oz. thirds.....	1588d.	24
1896 oz. thirds.....	1593d.	24
1902 oz. thirds.....	1598d.	24
1908 oz. thirds.....	1603d.	24
1914 oz. thirds.....	1608d.	24
1920 oz. thirds.....	1613d.	24
1926 oz. thirds.....	1618d.	24
1932 oz. thirds.....	1623d.	24
1938 oz. thirds.....	1628d.	24
1944 oz. thirds.....	1633d.	24
1950 oz. thirds.....	1638d.	24
1956 oz. thirds.....	1643d.	24
1962 oz. thirds.....	1648d.	24
1968 oz. thirds.....	1653d.	24
1974 oz. thirds.....	1658d.	24
1980 oz. thirds.....	1663d.	24
1986 oz. thirds.....	1668d.	24
1992 oz. thirds.....	1673d.	24
1998 oz. thirds.....	1678d.	24
2004 oz. thirds.....	1683d.	24
2010 oz. thirds.....	1688d.	24
2016 oz. thirds.....	1693d.	24
2022 oz. thirds.....	1698d.	24
2028 oz. thirds.....	1703d.	24
2034 oz. thirds.....	1708d.	24
2040 oz. thirds.....	1713d.	24
2046 oz. thirds.....	1718d.	24
2052 oz. thirds.....	1723d.	24
2058 oz. thirds.....	1728d.	24
2064 oz. thirds.....	1733d.	24
2070 oz. thirds.....	1738d.	24
2076 oz. thirds.....	1743d.	24
2082 oz. thirds.....	1748d.	24
2088 oz. thirds.....	1753d.	24
2094 oz. thirds.....	1758d.	24
2100 oz. thirds.....	1763d.	24
2106 oz. thirds.....	1768d.	24
2112 oz. thirds.....	1773d.	24
2118 oz. thirds.....	1778d.	24
2124 oz. thirds.....	1783d.	24
2130 oz. thirds.....	1788d.	24
2136 oz. thirds.....	1793d.	24
2142 oz. thirds.....	1798d.	24
2148 oz. thirds.....	1803d.	24
2154 oz. thirds.....	1808d.	24
2160 oz. thirds.....	1813d.	24
2166 oz. thirds.....	1818d.	24
2172 oz. thirds.....	1823d.	24
2178 oz. thirds.....	1828d.	24
2184 oz. thirds.....	1833d.	24
2190 oz. thirds.....	1838d.	24
2196 oz. thirds.....	1843d.	24
2202 oz. thirds.....	1848d.	24
2208 oz. thirds.....	1853d.	24
2214 oz. thirds.....	1858d.	24
2220 oz. thirds.....	1863d.	24
2226 oz. thirds.....	1868d.	24
2232 oz. thirds.....	1873d.	24
2238 oz. thirds.....	1878d.	24
2244 oz. thirds.....	1883d.	24
2250 oz. thirds.....	1888d.	24
2256 oz. thirds.....	1893d.	24
2262 oz. thirds.....	1898d	

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
*Proposed Isolation Hospital.....	Windsor & Egham Jt. Hospital Bd. 50L		May 1

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be delivered
Curate's House at Belleek, Co. Fermanagh	Canon McKeena, P.P.	Parochial House, Pettigo	April 15
Materials, Sevenoaks	Wrotham U.D.C.	A. J. H. Powell, Surveyor, Borough-green, Sevenoaks	do.
Cloak-room, Extension to Infant School	King's Norton and Northfield U.D.C.	A. W. Cross, Engineer & Sur., 23, Valentine-rd., King's Heath	April 7
Cast-iron Emergency Staircase to Boys' School	do.	H. Bewick, County Architect, Chester	do.
Painting Asylum Buildings, Parkside, Macclesfield	Leeds Gas Committee	R. H. Townsley, Gas Offices, Leeds	do.
Cast-iron Pipes, Report Castings, etc.	Southampton Harbour Board	J. E. Pailthorpe, Clerk to the Board	do.
1,500 tons Guernsey Grey Granite	East Indian Railway Co.	G. W. Atkinson, Architect, 1, Mark Lane, Leeds	do.
Additions, etc., Royal County Hotel, Durham	Glasgow Corporation	G. W. Lackie, Engineer, 75, Waterloo-street, Glasgow	do.
Materials and Carling	do.	do.	do.
Cast-iron Joint Boxes	Kingston-upon-Hull Corporation	A. R. Bennett, Queen Anne's-chambers, Westminster, S.W.	do.
Water-Space Telephone Cable	Castleblayney R.D.C.	E. Berrin, Engineer, 46, Westmoreland-street, Dublin	do.
Ballyvaughan Waterworks	Merch U.D.C.	C. Greenwood, Clerk, Council Offices, March, Cambs.	do.
Materials	Dr. C. J. Perrott	J. MacKav, Architect, Regent-street, Kingswood, near Bristol ..	April 16
Villa Residence, Regent-street, Kingswood	Llantrisant & Llantwit Fawr R.D.C.	G. S. Morgan, Surveyor, School-street, Pontypridd	do.
Supply and Haulage of Limestone and Gravel	Stretford U.D.C.	H. Williams, St. George's-square, Dartmouth	do.
Renovating Dartmouth Wesleyan Chapel	Stratford and Wolverton R.D.C.	E. Worral, Surveyor, Council Offices, Old Trafford, Manchester ..	do.
Private Street Works	Goole R.D.C.	A. E. Abbott, Surveyor, 3, The Square, Wolverton	do.
Reconstructing part of Footway	Walmer U.D.C.	R. Pilews, Surveyor, 40, Burlington-green, Good	do.
Stone and Ashes	East Indian Railway Co.	H. W. Barker, Surveyor, Council Offices, Walmer	do.
Sewerage Works, Walmer, Kent	Committee of Management	C. W. Young, Secretary, Nicholas-lane, London, E.C.	April 19
Sixteen-Deck Spans (100 ft. in the clear)	Rathdown (No. 1) R.D.C.	A. C. Vargo, Secretary	do.
Cleaning, Painting, etc., Battell's Indrway, Oxford	Bootle Parks Committee	P. Cumlann, Clerk's Office, Longhulme, Dublin	do.
Sewage Purification Works	Chipping Sodbury Guardians	Borough Engineer, Town Hall, Bootle	do.
Demolition of Buildings, Falkner-crescent, etc.	Market Bosworth R.D.C.	Bernard & Son, Surveyors, Baldwin-street, Bristol	do.
Boardroom and Offices, Workhouse, Yate	Truist	J. Wiltet, Architect, Elgin	do.
House for Electric Installation, Arbury, Alnes	Hemsworth R.D.C.	W. M. Sykes, Surveyor, Chapel-street, Buxton	do.
Earthware Pipe Sewer, etc., Bagworth	South Molton R.D.C.	W. Beddoe Rees, Architect, 3, Dumfries-place, Cardiff	do.
New Hope English Baptist Chapel, Caern, Maesteg	Bradford Corporation	T. H. Richardson, Surveyor, Hemsworth, near Wakefield	do.
Water Supply, Shafton	do.	F. Day, 9, East-street, South Molton, Devon	April 20
900 ft. of Sewer, Chiffchamption	do.	J. Watson, Engineer, Town Hall, Bradford	do.
Requisites, Parks and Cemeteries	do.	J. H. Cox, City Surveyor, Town Hall, Bradford	do.
Station Buildings for Light Railway, Nidd Valley	Rutland C.C.	H. A. Adam, Clerk, Oakham	do.
Wrought-iron Railing and Gates, Gillingham Ground	Bournemouth Corporation	Robert & Heron, Architects, Scottish Provident-buildings, Belfast ..	April 21
Materials, Oakham	Committee of Presbyterian Church	F. Harris, Engineer, Broadway, Southborough, Tunbridge Wells ..	do.
Steel Poles, Overhead Line, Section Boxes, etc.	Tonbridge R.D.C.	O. Thomas, Engineer, Gas and Water Offices, Fearn, Glam.	do.
Resettling Church, Ballygilbert, Helen's Bay, Co. Down	Rhonda U.D.C.	G. Lintott, Cranleigh, and S. B. Hasell, Milford, Glamorgan	April 22
Materials, Team Labour, etc.	Hambleton R.D.C.	K. Thompson, Architect, Post-office-chambers, Eland	do.
Supply of 9,000 yds. of Cast-iron Pipes	Mr. J. Carter	J. F. Smille, Borough Surveyor, Tynemouth	do.
Laying Pipes	Tynemouth Corporation	R. W. Hamilton, Secretary	do.
Materials and Carling	Willington Co. Durham, Co-op. Soc.	B. Brown, Surveyor, Winstan	do.
Two Houses, Huddersfield-road, Eland	Barnard Castle R.D.C.	A. O. Evans, Williams, & Evans, Architects, Pontypriid	April 23
Conversion of Schools into Fire-station, etc., N. Shields	Messrs. Crosswell's Brewery, Ltd.	H. Sutherland, Town Clerk, Town Hall, Wick	do.
1,200 yds. of 6-in. Sewers, Tanks, etc., Cockfield	Wick Town Council	R. Routledge, Surveyor, Council Offices, Stanley	do.
Alterations, etc., Wingfield Hotel, Llanbadrach	Stanley U.D.C.	G. Armstrong, Architect, 24, Bank-street, Carlisle	do.
Water Supply	Carlisle New Brewery Co., Ltd.	W. H. Dashwood Caple, Architect, Church-st-chambers, Pontypriid ..	do.
Making Back Townley-street, Stanley	The Trustees	A. L. Thomas, Engineer, etc., Church-street-chambers, Pontypriid ..	do.
Alterations to Balmoral Hotel, Silloth	Caletonian Railway Co.	District Engineer, 16, Killermont-street, Glasgow	do.
Alterations to Hall, Abercromby	Burgess Hill U.D.C.	A. F. Hardwick, Clerk, Church-road, Burgess Hill	April 25
Chapel, Moriah English Baptist Church, Abercromby	Perth Town Council	R. McKillop, Burgh Surveyor, 13, Tay-street, Perth	do.
Steelwork, Renewal of Six Underbridges	Settle R.D.C.	T. A. Foxcroft, Engineer and Surveyor, Town Hall, Settle	do.
Road Works, St. Mary's-road	Wimbleton Education Committee	A. Steele Sheldon, Council Offices, Wimbleton	do.
Causewaying Glover-street	Marsh Trustees, Newport, Salop	H. G. U. Elliott, Newport, Salop	do.
Causewaying Dunkeld-road and Barrack-street	Deshborough U.D.C.	D. J. Driver, Surveyor's Office, Desborough	do.
Bentham Water Supply Works	Ilford U.D.C.	H. Shaw, Surveyor, Town Hall, Ilford	do.
Oak Fences, Queen's-road School	Edmonton U.D.C.	H. W. Dobb, Architect, Town Hall, Dublin	April 26
Reconstruction of Surface Paving of Street	Dublin Corporation	R. Campbell, Town Clerk, City Hall, Dublin	do.
600 tons of Granite	Newcastle-under-Lyme Baths Com.	J. B. Langley, Architect, 49, Deansgate, Manchester	do.
Filter Beds and Material, Outfall Works, Water-lane	Hoxne R.D.C.	N. B. Garrard, Clerk, Hoxne, near Eves	do.
Erection of Building for Stores	Whitby R.D.C.	W. S. Gray, Clerk, 38, Flowergate, Whitby	do.
Inconducent Mantles and Jena Chimneys	Booke Corporation	B. J. Wolfenden, Borough Engineer, Town Hall, Bootle	April 27
King's Memorial Baths, Brunswick-street	Library, etc., Committee	Grasme-Watt & Tulloch, Architects, 77A, Victoria-street, Belfast ..	do.
Feildingdale Water Extension (Contract A.)	Wirral R.D.C.	F. E. Priest, Engineer, 13, Harrington-street, Liverpool	do.
Brick Sewer	Luton Town Council	Borough Surveyor, Town Hall, Luton	do.
Branch Free Library, Oldpark-road	do.	J. Edey, Surveyor, South-street, St. Neots, Hunt	do.
Sewers and Sewage Works, East Ham Village	St. Neots U.D.C.	Surveyor, Council Offices, Romford	do.
Sewering, Paving, etc., Smart-street	Romford U.D.C.	F. E. G. Bradshaw, Borough Surveyor, 36, Aldergate, Tamworth ..	do.
Broken Granite, etc.	Tamworth Town Council	Borough Surveyor, Alma-road, Windsor	do.
1,000 tons of Broken Granite, and 50 tons of Slag	Borough of Southend-on-Sea	Town Clerk, Town Clerk's Office, Southend-on-Sea	April 28
1,640 tons of Blue Guernsey Granite	Colchester Corporation	E. E. Blain, Waterworks Superintendent, Town Hall, Colchester ..	do.
Fencing, etc.	do.	do.	do.
*New Police and Fire-station in St. Leonard	do.	do.	do.
Erection of Public Library	do.	do.	do.
Direction of Horizontal Pumping-Engine	do.	do.	do.
Triple-Extension Horizontal Pumping-Engine	do.	do.	do.
Multitubular Steel Boiler, etc.	do.	do.	do.
Connecting Line at Miles Platting	do.	do.	do.
Bridge & Approaches over River Alyn at Rhydyrnwys	do.	do.	do.
Sand Drying Apparatus	do.	do.	do.
*Telephone Exchange at Sutton	do.	do.	do.
Nurses' Quarters, Swaffham	do.	do.	do.
Whitstone and Slag	do.	do.	do.
Seaweeding	do.	do.	do.
Timber and Concrete Pier, etc., Oban	do.	do.	do.
Two Electric Lifts for Goods	do.	do.	do.
One Electric Passenger Lift	do.	do.	do.
Boundary Walls at Workhouse	do.	do.	do.
Two Houses, Manchester-road, Denton	do.	do.	do.
Superstructure, Manchester Bridge	do.	do.	do.
New Sewers	do.	do.	do.
Additional Sewage Disposal Works	do.	do.	do.

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered
Site Drainage, Southern Section (Contract 2)	Glasgow Corporation	City Engineer, 64, Cochrane-street, Glasgow	May 2
Site Drainage, Primrose Meadow, Healey	Sheffield Health Committee	C. F. Wike, C.E., Town Hall, Sheffield	do.
Site Drainage, new Post-office, Salisbury	Commissioners of H.M. Works, etc.	The Postmaster, Salisbury	May 3
Quoting, General Repairs, etc., at Infirmary	St. George's Union	A. H. Newman, Workhouse, Fulham-road, S.W.	do.
Quoting, General Repairs, etc., at Infirmary	Lichfield B.D.C.	P. L. Tomkys, Chesterfield, near Lichfield	May 5
Quoting, General Repairs, etc., at Infirmary	Ordnance Survey	Officer in Charge of Stores, Ordnance Survey Office, Southampton	do.
Quoting, General Repairs, etc., at Infirmary	Wallasey U.D.C.	Manager's Office, Egremont Ferry, Cheshire	May 8
Quoting, General Repairs, etc., at Infirmary	Great Northern Railway Co., Ireland	W. H. Mills, Engineer, Amiens-street, Dublin	do.
Quoting, General Repairs, etc., at Infirmary	Metropolitan Borough of Islington	Borough Engineer, Town Hall, Upper-street, N.	do.
Quoting, General Repairs, etc., at Infirmary	Middlesex C.C.	H. T. Wakelam, County Engr., Middlesex Guildhall, Westminster	May 10
Quoting, General Repairs, etc., at Infirmary	East Ham Education Committee	E. L. Curtis, 11, Finsbury-square, E.C.	May 11
Quoting, General Repairs, etc., at Infirmary	Dublin Port and Docks Board	J. P. Griffith, Engineer, East Wall, Dublin	May 16
Quoting, General Repairs, etc., at Infirmary	Barrow-in-Furness Corporation	Sir B. Baker, K.C.B., 2, Queen's-pl., Queen Anne's-mans., S.W.	do.
Quoting, General Repairs, etc., at Infirmary	Kensington Royal Borough Council	Borough Engineer & Surveyor, Town Hall, High-st., Kensington, W.	do.
Quoting, General Repairs, etc., at Infirmary .....	.....	A. G. Dalzell, Architect, 15, Commercial-street, Halifax	No data.
Quoting, General Repairs, etc., at Infirmary	Newcastle United Football Co.	N. Lewis, Architect, Oak-street, Aberlilly	do.
Quoting, General Repairs, etc., at Infirmary	The Committee	F. G. Watt, Secretary, 10, Leazes-crescent, Newcastle-on-Tyne	do.
Quoting, General Repairs, etc., at Infirmary .....	.....	Davidson & Philipson, 148, Aldersgate-street, E.C.	do.
Quoting, General Repairs, etc., at Infirmary .....	.....	Worsfold & Hayward, 80, Cannon-street, E.C.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
Quoting, General Repairs, etc., at Infirmary	South Shields Corporation	Not stated	April 22
Quoting, General Repairs, etc., at Infirmary	Brentford Union	See advertisement in this issue	April 25
Quoting, General Repairs, etc., at Infirmary	Metropolitan Asylums Board	3l. 8s. per week each	April 26

Those marked with an (*) are advertised in this number.

Competitions, iv.

Contracts, iv. vi. viii. x.

Public Appointments, xviii.

TENDERS.—Continued from page 421.

REBELEY (Sheffield).—For sundry alterations at the Police Station, Healey, Sheffield, for Messrs. Thos. Brown & Co., Ltd. Messrs. Hall & Fenton, architects, 11, R. Lane, new, Sheffield. Quantities by architects:—
J. Sheppard, £394 2 10 J. Masson, £280 15 0
C. H. May, £365 15 0 W. W. Mours, £275 15 0
C. B. May, £337 0 0 E. Moore, £274 0 0
C. B. May, £319 0 0 F. Drake, £271 7 0
J. H. Hodge, £312 0 0 T. Margerison, £385 0 0
J. H. Hodge, £297 15 0 Dronfield*, £208 17 6

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H. Bouneau, £214 12 Mayfair-avenue, £164 0
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Woollaston Bros., £218 0 J. Haydon & Sons, £148 8
H. Willmott, £175 0 St. Thomas*, £120 0
J. Grover & Son, £168 0 Works, Hackney*, £120 0
Hackney, S., Berger-street.
A. J. Sheffield, £209 0 Unassigned, £133 0
A. E. Symes, £164 0 A. W. Derby, £130 0
W. Sharnum, £147 10 Barrett & Power, £115 0
Sons, Ltd., £147 10 St. Thomas*, £115 0
J. Stewart, £138 15 Works, Hackney*, £115 0
Hamstead, Netherwood-street.
H. Eady, £231 0 General Builders, £155 0
J. Peattie, £187 5 Ltd., Wharf-road, £155 0
F. Chidley & Co., £170 0 P. T. Chinchin & Co., £147 0
W. Chappell, £155 0 Co., £147 0
Holborn, Rosebery-avenue.
W. Hornett, £230 0 J. R. Sims, £131 0
T. D. Long, £168 0 T. L. Green, £123 0
Holloway Bros., £170 0 P. T. Chinchin & Co., £90 10
(London), Ltd., £165 0 Co., Kensaal Green*, £90 10
J. Peattie, £155 13 Co., Kensaal Green*, £90 10
Islington, N., Thornhill-road.
McCormick & Son, £180 0 F. W. Harris & Co., Ltd., £137 0
G. S. S. Williams, £164 0 Marchant & Hirst, £136 0
Patman & Fotheringham, Ltd., £168 10 Wilton Works, £108 0
G. Kirby, £153 10 Islington*, £108 0
Stevens Bros., £139 10
Islington, S., Richard-street.
McCormick & Son, £212 0 Barrett & Power, £160 0
A. Porter, £202 0 F. W. Harris & Co., Ltd., £159 0
G. Kirby, £193 0 Ltd., £154 0
Patman & Fotheringham, Ltd., £192 5 P. T. Chinchin & Co., Kensaal Green*, £164 0
Stevens Bros., £173 0
Newington, W., Beresford-street.
W. Hornett, £397 0 Appleby & Sons, £277 0
H. J. Williams, £317 10 Maxwell Bros., Ltd., £268 0
W. Smith & Son, £305 0 W. Saver & Son, £258 10
W. Y. Good, £290 0 85, New Kent-road*, £258 10
J. Greenwood, Ltd., £278 0
St. George-in-the-East, Lower Chapman-street.
A. J. Sheffield, £325 0 J. Haydon & Sons, £202 12
A. E. Symes, £218 0 Vigor & Co., £178 0
A. W. Derby, £211 0 King-street, £178 0
G. Munday & Sons, £204 0 Poplar*, £178 0
Wandsworth, "Frogmore."
W. Read, £279 0 Rice & Son, £149 0
R. A. Jewell, £70 0 C. Gurling, £36 0
Hudson Bros., £63 0 Ethelburga-street*, £39 15
E. B. Tucker, £54 0
LONDON.—For repairs and decorations to the Half Moon, Bow, E. Mr. H. Riches, architect, 3, Crooked-lane, King William-street, London, E.C.
Clemons Bros., £165 10 J. S. Robey, £147 10
Elkington & Sons, £165 0 A. W. Derby*, £120 0
T. Osborn & Sons, £158 0

REBELEY (Sheffield).—For sundry alterations at the Police Station, Healey, Sheffield, for Messrs. Thos. Brown & Co., Ltd. Messrs. Hall & Fenton, architects, 11, R. Lane, new, Sheffield. Quantities by architects:—
J. Sheppard, £394 2 10 J. Masson, £280 15 0
C. H. May, £365 15 0 W. W. Mours, £275 15 0
C. B. May, £337 0 0 E. Moore, £274 0 0
C. B. May, £319 0 0 F. Drake, £271 7 0
J. H. Hodge, £312 0 0 T. Margerison, £385 0 0
J. H. Hodge, £297 15 0 Dronfield*, £208 17 6

LONDON.—For the erection of three shops at Putney, S.W. Mr. H. Riches, architect, 3, Crooked-lane, King William-street, London, E.C. Quantities supplied:—
H. B. Oldrey & Sons, £4,970 S. L. Scole & Son, £4,600
J. Dorey & Co., Ltd., 4,875 W. H. Williams, £4,297
H. Burman & Sons, £4,822 Courtney & Fair-T. Adamson & Sons, £4,750

LONDON.—For repairs and decorations to the Prince of Wales public-house, Bethnal Green, E. Mr. H. Riches, architect, 3, Crooked-lane, King William-street, London, E.C.
W. Irwin, £367 Ellington & Son, £246
T. Osborn & Sons, £290 J. T. Robey*, £228

LONDON.—For additions to Messrs. Cox & Co.'s Bank, 16, Charing-cross, S.W. Mr. H. Ling, architect, 21, Charing-cross. Quantities by Mr. G. Jackson, 6, Lebanon-gardens, S.W.
Hayward & Son, £2,697 Holloway Bros., £2,120
Hollingsworth, £2,580 Collis & Sons*, £2,112

NEWPORT.—For additions to premises of the Cardiff Pure Ice and Cold Storage Co., Shaftesbury-street, Mr. E. W. M. Corbett, architect, Castle-street, Cardiff:—
R. C. Jordan, £13,781 J. T. Partridge, £9,349
Knox & Wells, £9,398 J. Charles, £9,215

OLD PENSHAW.—For building thirty-eight houses, Houghton-le-Spring Rural District, for Messrs. Kirby & S. Tulp and others. Mr. J. Fallisier, architect, Philadelphia, Durham:—
J. Johnstone & Sons, Boldon Lodge, Boldon, near Sunderland*, £6,904

PONTFRAC.—For erecting shops and offices in Pontefract, for the Pontefract Industrial Society, Ltd. Messrs. Garside & Pennington, architects, Exopergate House, Pontefract, and Castleford:—
Gill & Sons, £1,327 0 0 Thompson & T.H. Moverley, £1,305 0 0
B. Walker & Jackson, £1,127 13 0
Sons, £1,238 9 0 Dumberline, £1,125 0 0
G. Spurr, £1,233 14 3 H. Randall, £1,076 11 0
Walker & Ward, £1,128 14 0 A. A. Askam and others, Pontefract*, £1,009 1 0

RUSHDEN.—For the erection of a villa residence on the Knuston-road, Rushden, for Mr. J. Knight, jun., in accordance with plans, specifications, and quantities prepared by Mr. E. Knight, architect and surveyor, Newton-road, Rushden:—
Lilley & Bull, £1,010 0 Harrison & Winsor, £980 0
Capps, Rowley, £909 10 Whittington & Tomlin, £925 0
F. Benson, £980 0 T. Higgs, £920 0
A. Johnson, £977 0 W. Packwood, £851 12
Hacksley Bros., £949 0 Rushden*, £851 12

SPINKHILL.—For alterations and additions to the Angel Hotel, Spinkhill, near Sheffield, for Messrs. Thos. Hawson & Co., Ltd. Messrs. Hall & Fenton, architects, 11, St. James-row, Sheffield. Quantities by architects:—
D. O'Neill & Son, £570 0 T. Margairison, £611 13 6
Wollerman Bros., £67 0 H. White, £610 0
J. Wright, £563 11 3 Charlesworth, £610 0
H. Brumby & Son, £557 0 J. Bertram, £605 0 0
E. & W. Oxley, £544 15 0 W. W. Mears, £537 0 0
C. Portass, £537 0 0 Leavygreave-road, Sheffield*, £497 15 0
E. Moore, £515 0
F. Drake, £512 16 0

SHERINGHAM.—For public lavatories, cloakrooms, and promenade approach, for the Sheringham Urban District Council. Mr. T. Inglis Goldie, architect, Bank Plain, Norwich, Surveyor to the Council:—
C. A. Sadler £2,100 0 0 H. Bullen .. £1,850 0 0
J. W. Weston 2,002 16 0 Edwards & Hannant .. 1,947 0 0 Utting .. 1,809 19 1
[Architect's estimate, £1,800.]

SHINFIELD.—For rebuilding York Pool Bridge, Shinfield, near Reading, for the Berkshire County Council. Mr. J. Morris, County Surveyor, Broadway-buildings, Reading. Quantities by the County Surveyor:—
W. A. Baker .. £1,569 9 9 Rogers & Wood .. £1,098 0 0
F. Morton .. 1,551 4 11 Richards & Sons .. 1,077 0 0
Pedretto & Co. 1,491 0 0 W. Manders 1,077 0 0
H. W. Godwin .. 1,488 0 0 East & Hyde 1,075 0 0
Cunningham .. 1,441 8 3 Co. 1,056 16 0
J. H. Vickers 1,345 0 0 J. O. Brellell 1,039 0 0
A. Pindley .. 1,298 4 10 E. C. & J. Tiddeley 1,038 16 7
& Co. 1,216 16 11 G. Pilgrim .. 1,033 0 0
Long & Allen 1,208 4 10 E. C. & J. A. T. Catley 1,190 0 0 W. H. Tuckor 952 0 0
Howarth & Froude .. 1,180 0 0 A. J. Ellis .. 950 0 0
Woods & Moor .. 1,175 6 8 G. Thompson 903 12 6
Fulham .. 1,150 0 0 C. W. Cox & Sons .. 900 0 0
S. A. Steel .. 1,150 0 0 Parsons & Co. 856 11 6
Newham & Love .. 1,135 0 0 E. Wheeler 818 10 0
A. D. Daw .. 1,132 2 0 Black .. 818 10 0
Chelmsford .. 1,116 12 8 Hants* .. 815 4 0
[County Surveyor's estimate, £911 19s.]

SOUTHALL (Middlesex).—For making-up roads, for the Southall-Norwood Urban District Council. Mr. Reginald Brown, Engineer and Surveyor, Public Offices, Southall:—

	Beaconsfield-road (part of).	Grange-road.	Lady Margaret-road.
	£ s d.	£ s d.	£ s d.
Free & Sons ..	816 17 8	743 7 6	813 10 0
Chambers ..	911 1 0	743 7 6	960 8 8
Harry & Co.	831 12 10	671 1 10	820 6 8
T. Watson, jun.	760 13 2	595 4 3	771 5 7
J. Macklin ..	—	—	926 4 9
A. & B. Hanson ..	777 0 0	602 0 0	755 0 0
J. Mowlem & Co., London ..	747 0 0	580 0 0	760 0 0
W. Neaves ..	825 0 0	662 0 0	834 0 0
Rowyer ..	—	595 0 0	820 0 0
T. Adams ..	794 15 5	629 15 0	816 15 1
Harvey Bros.	783 0 4	616 12 0	758 8 11
C. W. Killingbeck & Co.	891 16 8	712 14 10	920 13 6
Engineer's Estimate ..	768 0 0	608 0 0	767 10 0

SOUTHALL.—For construction of roads and sewers on the Southall Glebe Estate, Southall, for Messrs. Baxter & Gosney. Mr. C. G. Miller, architect and surveyor, 65, Chancery-lane, W.C.:—
Neave & Son £1,772 0 0 Killingback & Co. £1,320 0 0
H. Morecroft 1,839 0 0 T. Adams .. 1,249 0 0
A. & B. Hanson .. 1,325 0 0 T. Watson, jun. 1,247 17 6

SOUTHWICK (Sussex).—For private street works, Walling-road, for the Urban District Council. Mr. C. W. Warr, Surveyor, Council Offices, Southwick. Quantities by Surveyor:—
Woolgar Bros. £276 9 4 A. C. Soan .. £232 10 8
J. Parsons & Co. 276 0 0 E. H. King .. 231 9 0
Sons .. 276 0 0 G. Hackley .. 227 3 0
J. Whittington 248 15 6 Southwick* .. 227 3 0

SWANLEY JUNCTION (Kent).—For the construction of a villa residence for Mr. W. G. Burgess:—
J. Lonsdale .. £1,875 Purton & Johnson, Dartford* .. £1,325
W. F. Blay .. 1,550
T. Ellingham & Sons .. 1,475

TREDEGAR.—For erecting twenty-eight houses at Park Hill, for the Tredegar Chamber of Trade Building Club. Mr. W. Beddoe Rees, architect, 3, Dumfries-place, Cardiff. Quantities by architect:—

	Months.
Barnes, Chaplin, & Co. ..	£9,566 0 0
D. J. Vaughan ..	8,540 0 0
R. Edwards ..	8,894 0 0
J. Newcombe ..	8,812 0 0
W. Watts ..	10,150 0 0
E. P. Davies ..	7,905 17 6
J. Charles ..	8,400 0 0
J. Davy ..	8,860 0 0
D. W. Davies, jun.	7,840 0 0
D. Jones ..	9,850 0 0
D. Davies, son.	8,900 0 0

Amended Tenders on Bill of Deductions from the First Lowest Tenders.
J. Charles, Newport .. £7,300 0 0
J. Newcombe, Tredegar .. 7,412 0 0
D. W. Davies, Cardiff and Tredegar* .. 7,224 0 0
E. P. Davies, Dowlais .. 7,220 13 3
D. J. Vaughan, Tredegar .. 7,549 0 0
It was decided to retain Ebbw Vale brick facing, and the tender of D. W. Davies, Cardiff and Tredegar, was accepted at £7,324.

WATH BROW.—For building a reading-room at Wath Brow, Cumberland, for the trustees of the Wath Brow Working Men's Institute. Mr. W. Dixon, Engineer and Surveyor, Cleator Gate, Cleator, Cumberland:—
H. Tinnion .. £490 0 0
Ellbrook & Son .. 471 2 6
R. Pearson, Jack Trevors-road, Cleator Moor* .. 470 0 0
Masons: Ellbrook & Son .. 196 0 0
Mason: S. Wilkinson .. 180 15 9
Joiner: J. Martindale .. 181 10 0
Joiner: J. Kelly, Cleator Moor .. 183 0 0
Plumber: J. Sumpton, Cleator Moor .. 21 8 0
Slater: T. Mandale, Maryport .. 33 15 0
Painter: J. B. Douglas, Egremont, Cumberland .. 0 18 6
* Sub-contract let out to them.

WIMBLEDON PARK.—For the erection and completion of proposed residence for Mr. E. Sokon Scott. Messrs. W. B. Tait & Co., architects and surveyors, 18, Ironmonger-lane, E.C.:—
E. J. Saunders & Co. £2,935 Patman & Fotheringham, Ltd. £2,373
Leslie & Co. Ltd. .. 2,680 W. H. Lorden & Son 2,360
Higgs & Hill, Ltd. .. 2,640 J. Appleby & Sons 2,300
J. W. Brooking .. 2,573 G. Neal .. 2,290
J. Shelbourne & Co. 2,484 Turtle & Appleton 2,245
Knight & Son .. 2,381 J. Burgess & Son .. 2,200

W. H. Lascelles & Co.

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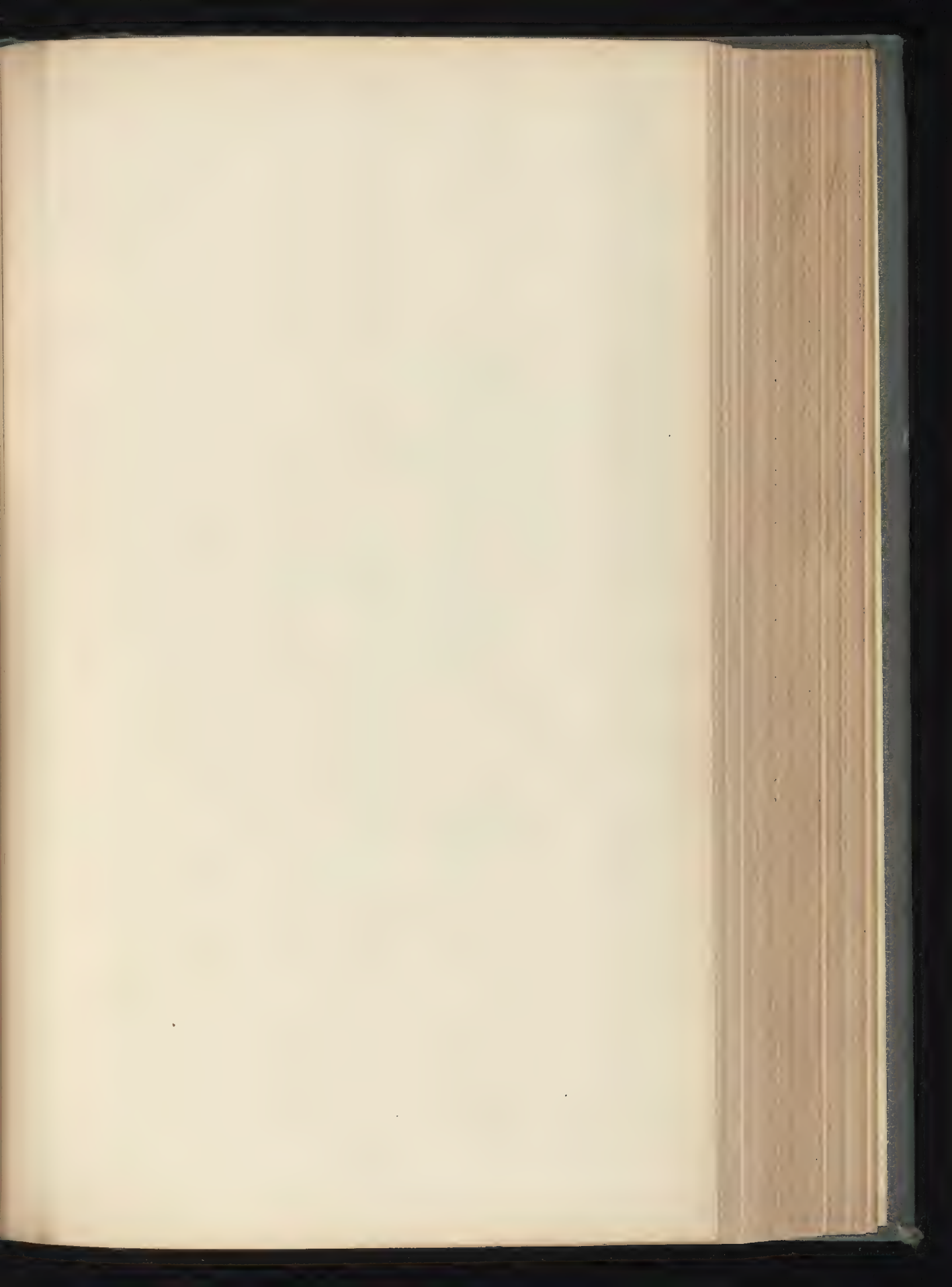


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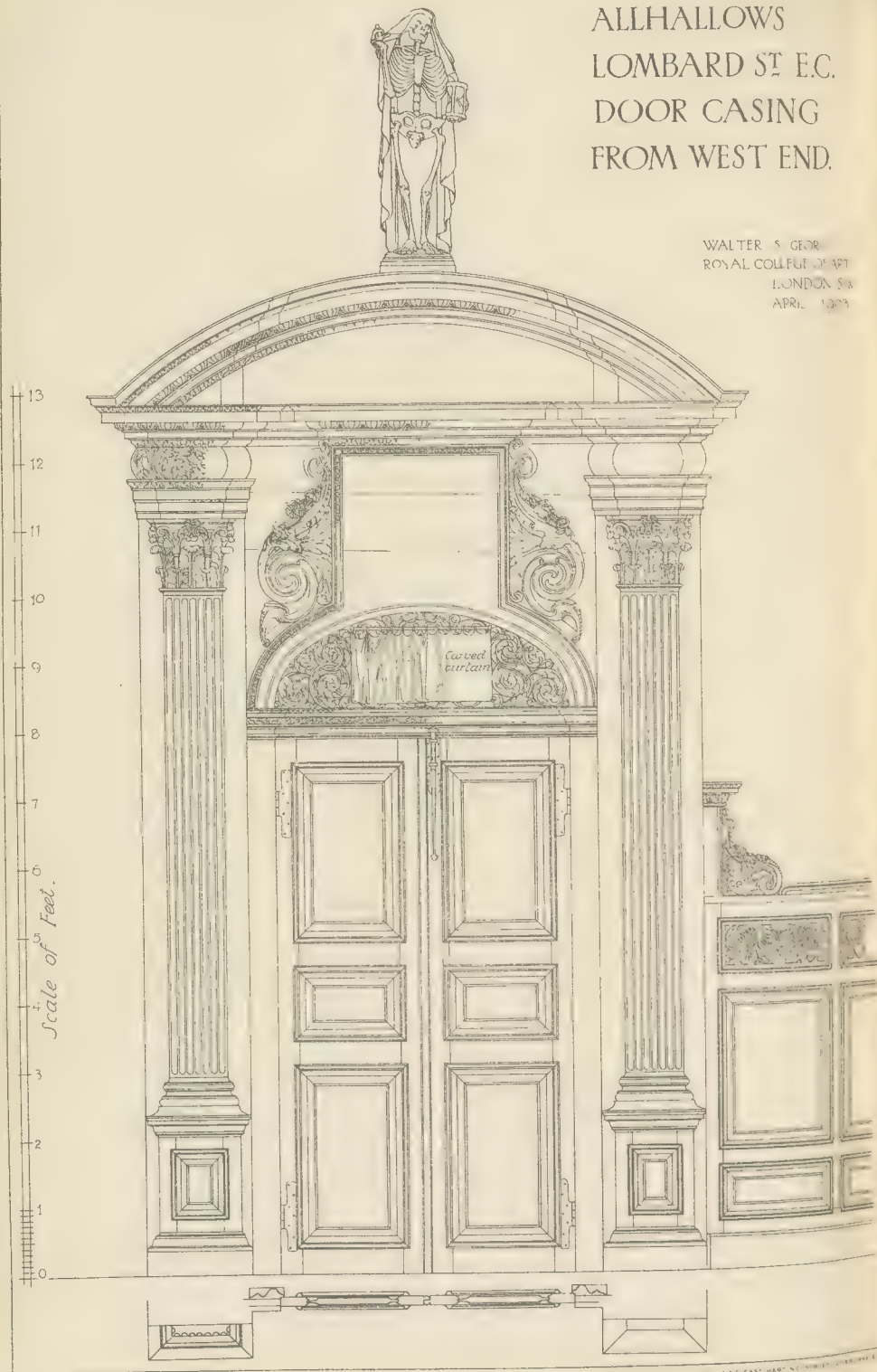


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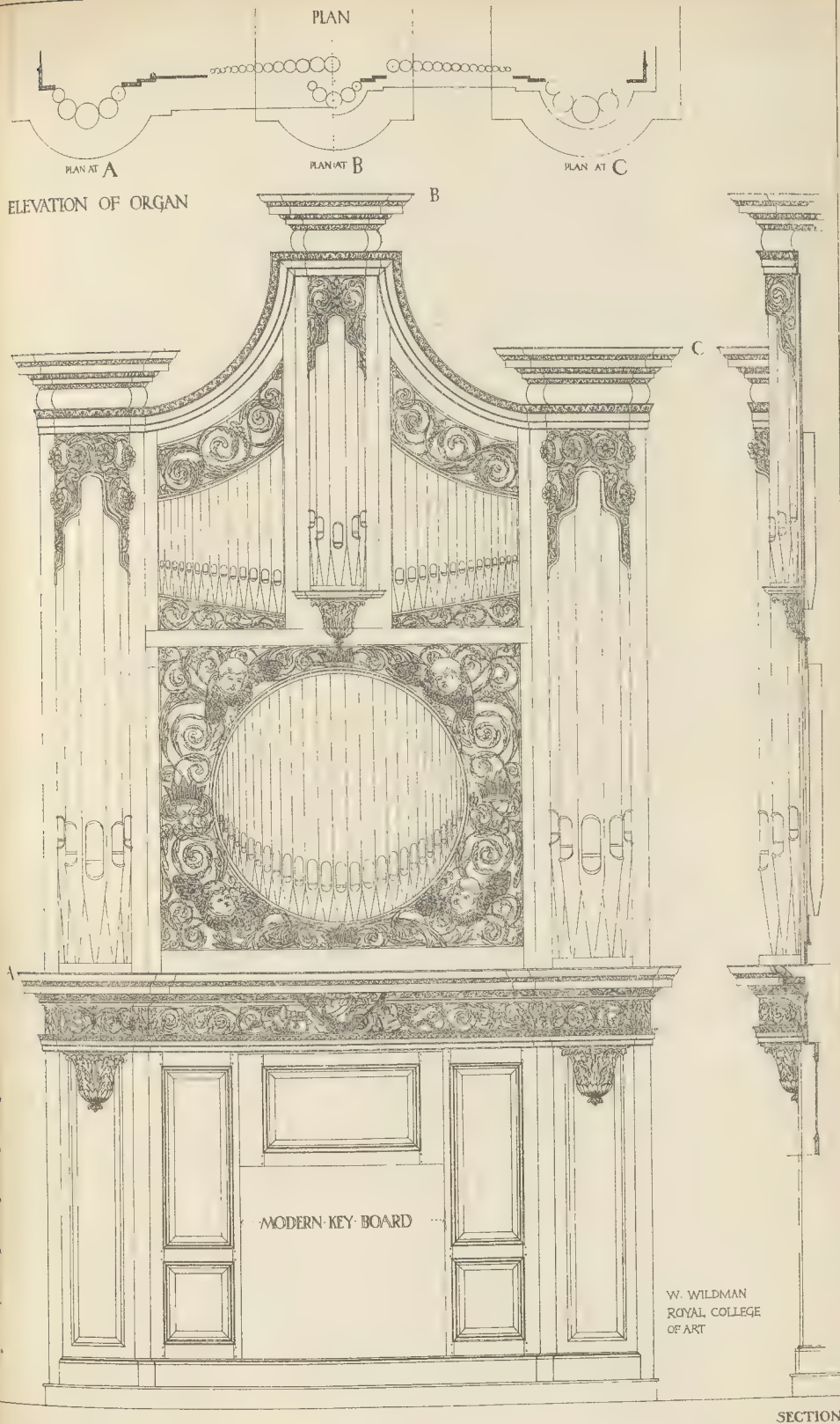


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INTERIOR VIEW.

The Builder.

VOL. LXXXVIII.—No. 3246.

APRIL 22, 1905.

ILLUSTRATIONS.

Memorial Hall, Massachusetts State House, Boston, U.S.A.....	Mr. Charles Brigham, Architect.
The Chapel, King Edward VII. Sanatorium, Midhurst.....	Mr. H. Percy Adams, F.R.I.B.A., Architect.
1. Exterior, from the Road.	
2. Exterior, South View.	
3. Interior.	
Buildings in Dunedin, New Zealand.....	From Photographs.

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Notes in New Zealand.

THE Britain of the South is the description New Zealanders often give of their admittedly beautiful country, with its cool and bracing climate, and its green and

and a present population of only 800,000, there is plenty of room for healthy expansion for generations to come.

But cities there are and cities there must be, so it may be interesting to note their present condition and the promise of their future. Commencing at the south, Invercargill may be referred to as a wide-spreading town of 11,000 inhabitants, with a few streets devoted to business and the rest to residences, mostly of moderate size but universally detached, one-storied, built of wood, and surrounded by hedges and gardens full of brilliant English flowers. The hedges are of "cupressus macrocarpa," clipped to perfection, and would charm the heart of the up-to-date young architect of "formal" tastes, for there he would see an ideal realised, which, alas! in our harsher climate requires the patience of many years. But over the architecture of most of the buildings it were kindest to draw a veil, for in the commercial portions cement is rampant and the detail "Colonial Italian," while weatherboard is the universal material for domestic structures. There are, however, one or two recent indications of capacity, so there is hope for Invercargill architecturally, and ten years hence another visitor may, and, let us hope, will, see a great improvement.

The city site is as flat as a pancake, its plan that of the prosaic chessboard, and only two buildings rise predominantly above the general level. One of these is the water tower, 100 ft. high, a circular iron tank elevated on the top of a four-storied structure of red and black bricks,

with as many windows as a dwelling; and as much misplaced feature and detail as could well be crowded on to its walls, an utter travesty of what a weight-supporting tower ought to be. The other is the unfinished Roman Catholic Cathedral, a Greek cross in plan, about 70 ft. by 70 ft., with an outer dome and drum of wood rising to 110 ft. But the main walls are only 14 in. thick and the windows large! It is true there are piers at the crossing, but 14-in. walls are rather too thin, even for a colonial cathedral. It is said that the architect is a clerical dignitary, assisted by a "practical" man, so one's wonder may cease. It will certainly make a great show for a little money while it lasts. Perhaps twenty or thirty years hence another will be required thrice its size, so possibly there is some sense in an apparent absurdity.

But adieu Invercargill, may your gardens prosper and your architecture improve! and away through the fertile southland to the Edinburgh of the Southern seas—Dunedin. Like its prototype, it is situated on an arm of the sea and is hilly, but there the resemblance ends. Why it is placed where it is, is hard to understand. A narrow strip of level ground, fronting shallow water and hemmed in by almost precipitous hills, up which the town has crept and overflowed into the valleys beyond, that is Dunedin. Towards the south and the sea beach a working-class quarter has spread out over what was once a sandy waste, but this is not the city, only an adjunct. On the narrow strip facing Port Chalmers, containing the business



smiling valleys, hills, and plains. But in their own opinion and that of many visitors it is, so far as nature is concerned, a new and improved edition on somewhat larger lines, with the one exception of volcanic activity which could well be spared. And as to its population, the British type is perhaps better preserved in this colony than in any other part of the Empire, for the stock is practically pure and food and climate are the same, or, if anything, better. It is also curious to note that at its colder southern extremity the population is predominantly of Scotch descent, while English monopolise the centre of the middle island, and the irrepressible Irishman is fortunately well distributed over the whole country. In a few generations they will mix, and a new and, let us hope, improved Anglo-Scoto-Celtic type be evolved in this southern land. Judging by present indications, they will be a tall, sturdy, fresh-coloured and self-reliant race, attached to the soil and outdoor life, and little likely to congregate in closely-packed cities as perforce do the great majority of Britons. With an area slightly larger than that of Great Britain,

quarters and more important buildings, the principal streets run parallel to the shore, but beyond them are set out diagonally to climb the hills, though even so are scarcely negotiable. In some cases the citizens have practically given them up as a bad job, so far as wheel traffic is concerned, and have formed them into sloping gardens with zigzag footpaths for foot passengers only; truly a most estimable way of turning a failure of one kind into a success of another. There are two centres to the city, the one designed, the other accidental; and, as often happens, the latter is the more important architecturally. The former is the Octagon, spanning the main thoroughfare (of course named Princes-street), and is graced by the town hall, but by nothing else of note (A: see lithograph plate of illustrations). This building stands well, and consists of a façade with wings and central tower. It is three-storied, treated as a basement with pilasters above, and the Renaissance detail is fair. The tower is surmounted by an iron balcony around the lantern, which is the chief blot on the design, but it looks like an afterthought, and is possibly the outcome of aldermanic wisdom.

Dunedin as a city strikes one by its air of solid prosperity, and, appropriately enough, its most important building architecturally is a bank, and that the Bank of New Zealand. It fronts the intersection of Princes-street and High-street (C on plate), the second centre above referred to, and is a really well-designed specimen of Renaissance type built in dark grey stone. Its two stories are marked by three-quarter Doric and Corinthian orders, and the only point for criticism is the somewhat redundant detail, especially in the upper frieze. Some may perhaps choose the neighbouring First Presbyterian Church as the typical building of Dunedin. It certainly is more prominent, and shows up finely on its bluff from the harbour, but it is of that lean and starved though graceful Gothic so much affected in the middle of the last century. The illustration (E) will save description, and it will be noted how much it would have been improved had the square part of the tower been built 10 ft. or 15 ft. higher. For a wonder the Roman Catholics have not secured the best site, but then it must be remembered Dunedin was first settled by guaranteed members of the "Free Kirk," and it was not till long after that sufficient Catholics collected to support the institutions of their own faith. Their cathedral (B) is well up the slope of the hills above the town, and is at present only a front with two towers and nave and aisles. Its nearly black stone with white dressings is harsh in contrast, and its detail is of very ordinary character. But it is by no means bad, as is some of the remaining ecclesiastical work of the town. Education is naturally well looked after in a Scotch community, and is prominently in evidence in the University buildings and High School, the former on the flat near the shores of the harbour, the latter perched half-way up the hills adjoining "the Belt," a public reserve mostly covered with the dense but beautiful native "bush," and stretching for a long distance between the city and the suburbs. The University is still incom-

plete, but as far as built gives promise of an effective composition in its style, the early Domestic Gothic of forty years ago. The tower is the most striking feature, but it looks somewhat top-heavy, owing to the corbelled angle turrets. The High School, on the other hand, is complete, and its more massive principal tower, with its portico and bay windows, fits better into the general scheme, though even in this case the pinnacles are too pronounced for the size of the tower. But the whole of the building stands well and looks well, and its Tudor Gothic seems to be more in harmony with scholastic traditions.

The most noticeable work of recent date is perhaps the Law Courts (F), a rather florid but, on the whole, satisfactory design in Early Domestic Gothic. Internally, the details are carefully studied in the style, but practically the plan, though well arranged, is defective in light and air; the passages and principal courts are entirely dependent on top lighting and artificial ventilation, and hence are somewhat stuffy. The Police Court alone possesses windows, and is apparently the only one in which the acoustics are not faulty, for the others are lined with cloth hangings. A hideous feature of the exterior is the iron fire-escape balcony to the caretaker's quarters, which, though treated ornamentally (?), disfigures one part of the front. And this to a building of two stories only!

These iron fire-escapes are seen all over the city, attached to hotels, warehouses, factories, etc., wherever a few people are congregated. In cities like Chicago and New York, with buildings of great height, they are essential to safety, but to see them applied indiscriminately to two-storied brick structures, as well as to those of three or four, is simply absurd, and a satire on the lack of common sense characteristic of the official mind. One especially glaring example is a two-storied hotel, in one of the busiest of the city thoroughfares, with a substantial verandah over the pavement reaching to the first floor windows. But here also the iron balcony, with railings complete, is set close above the verandah roof. Verily, with our over-abundant Acts and regulations and hordes of inspectors, modern civilised life affords us but little of the freedom and liberty on which Britons so pride themselves.

But to return to our criticism of architectural efforts. The Prison, close adjoining the Law Courts, is a new Free Renaissance building of red brick and stone in two stories; it is of very commendable design, and, though anything but repellent, unmistakably expresses its purpose. The Police Courts adjoining are older, and designed very fairly in Gothic "à la Waterhouse," but artistically quite secondary to the Prison. A little distance away work is proceeding on the new railway-station, which, if the promise of its ground story is fulfilled, should form one of the architectural triumphs of the city. It is built of dark stone walling with white stone features, as are most of the larger buildings, and the contrast is rather hard. A noticeable structural item is the cement concrete backing to external stone work and concrete internal walls. The central entrance and its flanking arcades with

rusticated red granite Doric columns look well, but the unequally-balanced wings show some eccentricities of detail that had better have been avoided.

The original Hospital building (G), standing in a large block at the University end of the town, is such a curious structure that one wonders why it was ever built. It is of three stories apparently, but really only two, the lower windows being very large and round-arched and the upper small. Internally, there is a large central hall, top lit, with a narrow wooden gallery around it. The building also possesses two large towers and four small ones. It seems that the people, who many years ago wanted an Exhibition, could only get a grant in aid from the Government on condition that the building should be made use of subsequently as a hospital. Hence the anachronism. Of course pavilions of normal design have since been added, and the original structure is now used solely for administrative purposes, with the exception of two wards still retained therein.

It would occupy too much space to criticise or even refer to the many other buildings showing architectural character, of which the Stock Exchange, the Grand Hotel, the Standard and the Australian Mutual Provident Insurance Co., Sargood's warehouse, and the New Zealand Clothing Factory may be noted. There is also a very fairly-designed Gothic memorial at the intersection of Princes-street and High-street (C), and another in the Octagon, amusing for its inscription, which leaves one in doubt as to who is the person commemorated, the erector, or the ecclesiastical dignitary in whose honour it was nominally built. As to the suburbs, they are charming in their natural features, but there are few buildings of any size or good design, and wood is still the dominant structural material. So, with most pleasant recollections of a solid, steady-going, prosperous town which shows wonderful progress for its fifty or sixty years of growth and 50,000 population, one may take leave of Dunedin and wish for it steady advancement in all the arts of life.

NOTES.

The Trades Union Bill. THE section of the Trades Union Bill as to peaceful picketing has, after considerable discussion, emerged from

mittee in its original shape, all the amendments on it being rejected. This important provision runs now as follows:—

"It shall be lawful for any person or persons, acting either on their own behalf, or on behalf of a trade union, or other association, registered or unregistered, in contemplation of, or during the continuance of any trade dispute, or to attend for any of the following purposes, at or near a house or place where a person resides or works or carries on his business or happens to be:—(1) for the purpose of peacefully communicating information; (2) for the purpose of peacefully persuading any person to work or abstain from working."

There can be no doubt that if the Bill becomes law it will—as regards this section—become law in the above form, and it is certain to get on the statute-book sooner or later. Nevertheless, it will sanction a form of moral and physical violence, since it is altogether a different thing for a crowd of men to assemble round the gate of a factory and

considerable purpose of persuasion, and for one individual to meet another and to argue with him on a given subject. The value of the section to trades unions lies in its power of menace, and the section is one which, say what trades unions like, is contrary—as experience shows—to individual freedom.

The Channel Ferry Scheme.

This project, which is essentially the same as that brought forward years ago by Sir John Fowler, is again before the consideration of Parliament, but we doubt very much whether the sanction sought will be obtained. For the accommodation of the ferry steamers at Dover—the port selected as the English terminus of the service—an extensive marine station would be necessary, and for this there is really no room in the Commercial harbour. The Dover Harbour Board have their own plans for the future development of the port, and it is not likely that they will timely submit to the authorisation of the proposed marine station for the train-ferry. Between the Prince of Wales and Admiralty piers there is no room to spare for vessels in addition to the transatlantic and cross-channel steamers and craft of various kinds using the tidal harbour. On the landward side of the harbour gates all available space is already taken up, and it is difficult to see where the projected station could be established. Moreover, the considerable tidal range at Dover is a distinct obstacle to the scheme. Except in the middle of the little bay, the town is almost crowded into the sea by cliffs and downs. The Admiralty will allow no site to be made of the National harbour for commercial purposes, and the only available site would be on part of the area controlled by the Harbour Board. For the reasons already stated, we do not think it probable that any portion of this will be secured.

The Non-provided London Schools.

THE very careful Report of the Education Committee of the London County Council to the non-provided, or old "voluntary" schools in London, which was submitted to the Council on Tuesday, is an important document in regard to the structural state of these 438 schools. In 242, or 78 per cent., the drains have been found unsatisfactory; 25 per cent. are found unsuitable for their purpose. In some the staircases are dangerous in the event of fire or panic; ventilation and masonry is often bad; and "in several instances," says the Report, ventilation is secured only by opening both windows and doors. It is shown that the Report must necessitate immediate work to remedy the defects or to replace the deficient buildings. It shows what has been constantly insisted on in these columns, that the inspection of school structures by inspectors whose primary business is education is ridiculous. A scholarly gentleman may be a good judge of education, but in regard to sanitation and building construction he is a mere amateur. The Report may very well make other local authorities all over England look to this matter. Many outbreaks of diseases of an epidemic character are certainly due to bad ventilation and drainage in elementary schools,

and the health of the children is permanently lowered by the character of the buildings in which they study. At any rate, Londoners now know the state of the non-provided schools, and it is their duty to bring them up to the mark.

Tramways on the Embankment.

By the casting vote of the Speaker, the thorny question as to the desirability of tramways on the Victoria Embankment will come again before Parliament after consideration by a committee. Whatever may be thought about the advisability of tramways in the streets at all, it is quite certain that lines already in operation cannot be abolished, and that, so far as the southern system is concerned, the County Council will continue the programme to which they are virtually committed. At the present time an enormous traffic is conducted to and from Westminster and Blackfriars bridges, and considerable portions of the public highways at these places have been converted into what are virtually open-air railway-stations, very inconvenient for passengers, and particularly obstructive to ordinary vehicular traffic. The County Council have no moral right to monopolise the public streets in this way, but having a legal right they will continue to do so until some preferable alternative is offered. In our opinion, the best way of mitigating the nuisance would be to create a loop, *via* the Embankment, connecting the Westminster lines with those of Blackfriars, so that cars arriving at either of the present termini could cross over to the other, and commence the return journey without having to be shunted from one line to the other. The Embankment is not a popular resort, nor is it crowded with traffic. Hence no serious objection offers; while the removal of long rows of cars from the southern approaches to the two bridges would be a great advantage. Further, passengers to and from town would not be under the necessity of crowding round the cars at two points, for the loop-line would permit and encourage them to enter and to leave the vehicles at various stopping-places distributed between the two ends of the Embankment.

The Recent Telephone Fire.

MANY of our readers may have occasion to remember the fire that recently caused so serious an interruption to their telephone service. The inquest held at the City of London Coroner's Court, under the City of London Fire Inquests Act (1888), serves to emphasise the desirability of fire-resisting construction in all buildings where electricity is dealt with on a large scale, even if at low voltage. Under normal conditions there is no risk of fire from the current actually used, but lightning or the accidental contact of telephone cables with highly-charged conductors may cause a fire, with the most inconvenient results. This is exactly what happened in the case of the "Bank" exchange of the National Telephone Company, owing to the contact of a telephone cable with a conductor-rail on the District Railway. The immediate results were a fire, which destroyed a two-roomed timber structure beneath a cable-supporting derrick on Mansion House-

chambers, and another fire in a distribution-room on the top floor of a building 200 yds. away. The consequential result was the interruption of some 6,000 exchange and private telephone services. In these days, when incombustible building materials are practically as cheap as wood, it is astonishing to find they are so little used. In the case of fire it is always the unexpected that happens, and no precaution should be neglected, especially in places where a mishap, trivial in itself, may involve far-reaching consequences.

Iron and its Alloys.

AN important paper by Mr. T. Baker, describing the results of a research on the magnetic properties of some alloys of iron and silicon, appears in the *Journal* of the Institution of Electrical Engineers, which was published this week. In addition to testing the alloys mechanically and electrically, Mr. Baker employs the method of microscopic research which has proved so helpful in metallurgy. The alloys experimented on were made of Swedish wrought iron and a small percentage of silicon. It was found that if the silicon present did not exceed 3 per cent. there was no alteration in the mechanical strength of the alloy. If the quantity of the silicon exceeded about 4 per cent. the alloy became hard and brittle, and was very difficult to shape in the lathe. The presence of the silicon makes it much easier to magnetise the metal, but prevents it from becoming so powerful magnetically when subjected to high magnetising forces. It prevents it also from retaining its magnetic qualities so well. Whilst making it therefore less suitable for the field magnets of dynamos, it makes it much more suitable for use in alternators and in the cores of transformers. Dr. Hicks had previously suggested that those elements which give iron high permeability and low retentive force would cause it to crystallise in large crystals. It is interesting to note that Mr. Baker has found that the size of the crystals seen by the microscope in the mass of the iron increase as the percentage of the silicon in the alloy increases. On the other hand, it is well known that the addition of a small quantity of tungsten and chromium makes the metal crystallise in very small crystals and enormously increases its retentivity. The microscope apparently will be a powerful aid in the future to the manufacturer of dynamos.

The Blackwell's Island Bridge, N.Y.

ACCORDING to the plans authorised in the year 1884, this bridge was to consist of five cantilever spans, with one pier on Manhattan Island two piers on Blackwell's Island, in the middle of the East River, and one pier on Long Island shore. After the lapse of several years the municipal authorities of New York took up the project, and in 1902 the Bridge Commissioner decided to make the spans of the following lengths:—The Manhattan shore span 469 ft. 6 in., the main river span 1,182 ft., the Blackwell's Island span 630 ft., the second river span 984 ft., and the Long Island shore span 459 ft. Thus the proposed structure will include one of the longest cantilevers in the world, although the span will fall far short of the 1,710 ft. cantilevers of the Forth Bridge.

Up to the present time no particular hurry seems to have been displayed in connexion with the progress of work, but as the congestion of cross-river traffic has increased very rapidly of late years there is reason for believing that operations will be pushed forward with all possible speed. The masonry piers are already built and the superstructure is well in hand. When completed, the Blackwell's Island bridge will constitute the fourth means of cross-river communication, and will form a welcome addition to the three suspension bridges between New York and Brooklyn.

The jury concerned in the Paris Façades Competition prizes now annually given for what are adjudged to be the best modern house façades in Paris, have just given their awards in respect of the houses built in Paris in 1903. The prizes are given for the following houses: 48, Quai de la Rapée—M. Frièsé, architect; 41, Rue Darremont (M. Goujon); 9, Rue Claudechahu (M. Klein); 98, Avenue Malakoff (M. Natanson); 185, Rue St. Honoré (M. Sibien); and 96, Rue Beaubourg (M. Walwein). The number of competitors becoming more and more important each year, M. Quentin-Bauchart proposes to ask the Municipal Council to award further prizes for the future competitions.

THE new buildings which form the headquarters of the Seven Dials Mission, comprising Sunday-schools, clubs for men, girls, and boys, gymnasium, meeting-rooms, etc., have been erected after plans and designs of Mr. C. W. Reeves. They cover the site of the former mission-house—the old vestry house in West-street, which was built, together with the adjoining chapel, in 1693, for a Huguenot congregation who had migrated to Newport Market from Weld House in Great Wild-street. The Episcopal Chapel, at first known as La Pyramide de la Tremblade, subsequently became a scene of John Wesley's labours during the period 1743-1790, and is frequently mentioned in his diary; in 1800 it was added to the establishment. The Seven Dials Mission removed from Short's-gardens to West-street, where they bought for 4,500*l.*, in December, 1887, the freehold property, but three or four years ago the London County Council called for the demolition of the premises as being in a dangerous condition. The first floor of the vestry-house contained an apartment having three windows opening into the chapel; it was known as the "Nicodemus room," being used by those who attended the Methodist services, yet desired that their presence should not become known. A drawing of the old house and Wesley's portable open-air pulpit have been preserved as relics.

THE Exhibition of examples of Process Engraving at the South Kensington Museum is a very useful one for those who wish to follow out the progress of the methods of what may be called mechanical reproduction of pictures and drawings, and it is rendered more useful in this sense by a long and carefully written account of the history of the subject by Mr. J. Waterhouse, which forms the preface to

the catalogue. In looking at some of the examples of photolithography of half a century ago, one is struck by their comparatively excellent character, so that it does not appear that the results have been much improved on since then, though probably the facility of production has much increased. The Art Photogravure Company show one or two remarkable reproductions in colour, especially M. Benjamin-Constant's portrait of the late Queen, which are described as in "one printing." Messrs. J. Swain & Son show a set of six small pictures reproduced by their "Half-Tone" Colour Process, which are very successful, one of a picture by Mr. Montague Smythe appearing really almost like a water-colour drawing. The defect of many colour reproductions is to be too hard and precise; a broken surface is better. This is attained very well also in the reproduction of a number of Mrs. Allingham's drawings by the Hentschel Colour-Type Process. One cannot but reflect, however, on seeing a large collection like this of mechanical process work, how uninteresting all this is in comparison with the hand-work of engraving and etching. Process reproduction has no doubt had the advantage of extending the knowledge of pictures by multiplication at a cheap rate, but it has none of the artistic interest of engraving by hand.

THE Ninety-second Exhibition of the Institute of Painters in Water-Colours. Painters in Water-Colours is held under difficulties, for owing to alterations going on in the building their fine staircase is closed, and the visitor only mounts by the other staircase through an atmosphere of dust and plaster. The Institute Exhibition contains a great number of the class of drawings of which one looks in the catalogue to see what is the subject before finding any interest in it; and it may be questioned whether there is a single work in the gallery of the highest order of interest. Mr. Lee Hankey, who seems to aim at producing very large water-colours with a moral meaning, has fortunately got a better subject, in his picture of the sceptical clergyman administering the sacrament (473), than the disagreeable one which he chose a year or two back, and his picture is striking, though the interest depends rather on the thing meant than the way it is painted. All Mr. Frank Dadd's semi-humorous subjects are excellent both in point and in artistic execution. In a very different way Mr. Henry Stock pleases us with his picture of a naked infant on "A Bed of Roses" (6), a work in its feeling and colour a little recalling Watts. "The Shepherd" (30), by Mr. Sainton of silver-point celebrity, is conventional but very pretty. There are few other figure pictures that are more than commonplaces: Mr. Henry Stock's allegorical group, "Influences" (333) is fine in colour but rather grotesque in idea; Mr. Walter Langley's "His Only Pair" (503) is a very good and pleasant piece of genre painting; and a half-length figure by Mr. Mortimer Menpes called "Iris" (244)—but not Juno's messenger—shows very delicate painting and characterisation in the head. There are, it is true, plenty of figure-pictures of what ought to be important subjects, but they

are not interesting. Among landscapes those of Mr. Weedon and Mr. John White can always be depended on, also the seascapes by Mr. David Green; and an inland landscape by the same artist, "A Surrey Common" (397), shows a grand bit of sky. Among others to be looked at are Mr. Hait's fine freely-treated garden scene at "Hampton Court" (14), all those bearing the name of Mr. John R. Reid; Mr. Cotman's "Mill on the Ouse" (49); we may say that artists will find a great many subjects among these old timber mills of the Ouse, which have been rather neglected; Mr. Arthur Severn's "The Taj, Agra" (165), a much better representation than some we have seen; Mr. Frank Walton's "Barden Bridge" (184); Mr. Tatton Winter's "Dusky Eve" (239), an original effort; Mr. Claude Hayes's "Near Wells" (256); Mr. Thos. Pyne's two small drawings, "After Rain" (270) and "The West Wind" (274); Count Seckendorff's brilliant sketch of "Venice" (276); Mr. Bruhl's "February Floods" (373); Mr. Hubert Coutts's "An Anglesey Common" (454); and Mr. Leslie Thomson's "La Pernelle—Normandy" (506), a smaller edition of one of his pictures at the last "Six Landscape-Painters" Exhibition.

At the Leicester Gallery are two rooms full of charming water-colour drawings, the one set by the late Mr. Hine, the other, illustrations of Sussex, by Mr. Wilfrid Ball. The work of Hine, who died in 1895 at the age of 84, goes back to a period in water-colour painting different from the taste of the present day, with less glitter of effect, less cleverness, but more repose and more attention than we often find at present. Hine made down scenery, especially that of Sussex, his special study, and for many years his landscapes of this class, with their receding planes of colour in fold after fold of hill, were pleasantly familiar in exhibitions, and one is glad to renew acquaintance with a collection of them. The finest perhaps is "Durlstone Bay, Dorset" (22), so remarkably true to the character of Dorset coast scenery, and in which the zones of light and colour on the sea are so finely treated. "Bible Bottom" (18), another of the finest, appears to be the same scene which is painted on a larger scale in "On the Malling Hills" (24); if not, the resemblance in the lines of composition is curious. Among the smaller works are many that are admirable, dealing with down scenery, seascapes (see No. 8, "A Breezy Day"), and ancient structures, such as "Wareham Bridge" (5). The views of "Old Hastings" (44) and the "Old Fishmarket, Brighton" (47) have a certain historical interest. Mr. Wilfrid Ball's drawings are, all but one, small sketches of country and village scenes, executed in a broad and true water-colour style: the small landscape "Wood" (11) (5) is one of the best examples. "The White Mill" (10), a scene by a river, is a very fine work, notable for a grand effect of detached masses of floating clouds. In the vestibule at the same gallery is a small collection of chalk drawings by M. Helleu, portrait figures of women in the same style as his well-known drawing sketches, but

like him better as an etcher than in these sketches. Even in his etchings there is a certain want of refinement, not of artistic style but of character; his ladies are essentially "mondaines," which is to say that they are not exactly ladies, in the best sense of the term; and in these sketches the "mondaine" sometimes approaches too nearly to the "demi-mondaine" to leave an agreeable impression.

At the Gallery of the Fine Art Society is a collection of water-colours by Mr. Ernest Briggs illustrating "Fishermen's Hauls in the Highlands." As might be expected from the title, these belong rather to the category of what may be called topographical drawings; but the author possesses of a good broad style, and "The Falls of the Tummel" (26) is a forcible painting of a rush and tumble of water. Occasionally, as in "Fir Trees at the Head of Loch Awe" (39), the artist seems to break from his programme of painting localities, and gives us a time and poetical bit of pure landscape art. "Stepping-stones at Kyleakin" (24), with the picturesque low white stone cottages beyond, is another landscape which is interesting for itself, as also "Scalassag, Island of Colonsay" (51). In another room is a fine collection of etchings after Meissonier, by various French etchers. The chief interest of this lies, perhaps, in the opportunity it gives us of seeing so many of Meissonier's designs together. Poetry there hardly is in any of them; the one solitary exception, perhaps, is "The Man at the Window" (16), which suggests more than meets the eye; but the scenes in the *Napoléon* series bring before us episodes of a great epoch with such truth and reality that, if the artist does not bring the poetry of art to his task, he enables us to realise the poetry of life. Meissonier's power lay in his unrelenting study to obtain perfection in the representation of life; he affords one of the most favourable comments on Reynolds's rather questionable dictum that genius was really "an infinite capacity for taking pains." In such a work as "The Sign-Painter," for instance, though the incident and the personages are of little interest in themselves, one is fascinated by the extraordinary personal reality of the landlord who stands looking at the signboard. He belongs to a period quite before that of Meissonier's own life; the painter could never have seen that man in that costume of the day; yet the figure impresses us with such a strong sense of personality that we regard him as a real person rather than a painted figure; we feel that he must have lived some time or other. That is the secret of Meissonier's art; it is not imaginative, but, on the other hand, it is so absolutely and triumphantly real.

A COLLECTION of small pictures of Indian subjects by Mr. Mortimer Menpes is on view at the Dowdeswell Gallery. There is a great deal of charming colour effect in these works, which it is difficult to class exactly; some few of them are paintings, the majority are in water-colour on a ground of opaque white, which shines more or less through the colour

laid on, producing an effect which is brilliant but rather artificial. There are among them brilliant little fantasies in colour, such as we see in "Workers in Silver and Gold" (7), the front of a shop with two foliated arches in its white walls, two figures in one of the windows, another dimly seen within; the stall-board casts a deep blue shadow on the wall beneath, and on it two bowls, green and red, contribute their colour to the scheme. It is in such scenes as this and "The Red Shutter" (55) that the artist's special gift is best shown; a three-quarter length of "A Woman of Delhi" (14) is however a very interesting sketch; the character of Indian architecture is also well shown in "Through the Streets of Delhi" (59) and "The Golden Temple, Amritsar" (61). In short, these may be called records of impressions of colour and incident rather than pictures in the usual sense of the word.

The private view of the Tenth Annual Exhibition of the Society of Miniature Painters. Painters drew a crowd of visitors to the Modern Gallery on Saturday. The art is not one with which we feel very much sympathy; miniature-painting is rather in the nature of an "elegant accomplishment" (as people would have said in Jane Austen's time) than a serious art, and the chief value of a miniature is for furnishing a portrait on a small scale of some one we are interested in. The collection, however, seems to be a very good one. Among the best things are the portrait of "Miss Eva Brand" (10) by Miss Lee Hankey; Miss Worsfold's "Mrs. Warren" (17); Mr. Jeffcock's piquant portrait of "Mrs. Jeffcock" (23) in a hat and a spotted lace veil; Mr. Sainton's little half-draped "Andromeda" (50), one of the few attempts at an ideal subject; and Miss Stratten's charming portraits of two infants (62 and 63). Miss Jessie Bayes exhibits some miniatures on vellum, of a mediæval character, and a portrait on gesso "A Garden Enclosed" (116), a complete seated portrait of a lady, which is very successful in effect.

At the Dickinson Gallery in Bond Street there is a small exhibition under this title, of which the principal portion consists of a series of water-colour drawings by Mr. A. C. Wyatt, purporting to represent "Shakespeare's Country and Woodland and Meadow"; but the connexion with Shakespeare is not very prominent, nor can we care much for the style of the drawings, though two or three of the New Forest scenes are effective. In addition to these there is a rather interesting collection of engraved portraits of Shakespeare; they differ very considerably, but from among them a certain central type emerges. There is also an oil portrait of the poet, lent by Lord St. Leonards, the history of which is not given, but which rather inspires belief in its authenticity from its marked and individual character. Some old editions of the plays are to be seen, and also (what interested us most) impressions of Stothard's designs of the "Seven Ages of Man," which show more vigour of characterisation than would be expected from Stothard's usually graceful and equable art.

NOTES AND SKETCHES IN SOUTHERN ITALY.—VIII.

BARLETTA AND CANOSA.

The earliest mention of Barletta is in the "Tavola Pentingeriana," where it appears as *Bardulos*. It lies on the Ofanto, the ancient *Anfidus*, on which Canusium had its emporium, a proof that the river was then navigable for over nine miles. Ancient sepulchres have been found on one line which traverses the city from east to west, and probably shows the direction of the military road—the *Via Valeria*—which went from Rome to the *Aternus*, then along the shore to *Anfidum*, and so to *Barium*, where it joined the *Via Egnatia*, or *Minucia*, a prolongation of the *Via Appia*, which went from Beneventum through Canusium to *Barium*, *Egnatia*, and *Brundisium*. It became the port of Canusium about the time of Theodosius. The mole was of the IIIrd century. The sea is retreating, and remains of it were found during excavations far from the sea, and the castle, which is now surrounded by arid sand, was close to the water in the middle of the XVIIIth century. In 747 the town was called *Baruli*, but the name *Baroletano* does not appear till 845. It seems certain that many of the people of Canosa came to live in Barletta, and S. Sabinus, Bishop of Canosa, built a church with the dedication of S. Angelo, which was consecrated in 493. At the Norman conquest of Apulia Barletta fell to Pierre d'Hauteville. The piazza of the market (now *Piazza del Plebiscito*) was called "*Paniero del Sabato*" a few years ago, a word derived from the Greek *παραγορη*, or Saturday market, which shows that this market was established while Greek was the common language of the people, probably in the Xth century, when the Byzantine colony was numerous and prosperous. It was one of the three ports from which Crusaders embarked for the first crusade. Bohemond and Tancred leading more than 7,000 men thither, Normans and native Apulians together. In 1151, by way of reprisal, the town was sacked by the Saracens. In 1172 William the Good stayed in Barletta for some time and gave much to the clergy, and hence the galleys set out for Venice in 1177 which carried the Pope and two legates on his part to settle terms of peace with Frederick Barbarossa. Frederick II. was often at Barletta, and Conrad, after landing at Siponto in 1252, proceeded hither and returned again after the ten months' siege of Naples had been successfully terminated. Manfred made a solemn entry into the town on February 2, 1259, when he was met on the Ofanto bridge by 700 persons with palms in their hands, who sang "Blessed art thou, coming in the name of the Lord." The palace at Barletta was offered by Charles of Anjou to Baldwin, formerly Emperor of Constantinople, after his dispossession by Michael Palæologos in 1267. There he died in 1275. Charles also established a mint in the city from which the first "regali" and "tari" made of gold issued, according to Lazari and Muoni. In 1459 Ferrante, son of Alfonso, was crowned King of Naples here, and in the same century Ferdinand of Aragon pledged it to the Venetians, together with Trani, Brindisi, and Otranto, against a loan for the purpose of making war against Charles VIII. of France. Ferdinand was besieged in the city by Giacomo Piccinino, who was René of Anjou's general, and only got free by calling in Giorgio Castriota, prince of Epirus. The governing body was called "*Università*," and had great liberty. The king only interfered to recommend the selection of upright and popular citizens and to require the delivery of accounts. There was no communal palace, the council met in the church of S. Mary Magdalene, where S. Domenico now stands, and the archives were kept in S. Sepolcro. The captain of the people had a palace, and the Largo del Palazzo marks the open space near its walls. This is united to the *Piazza del Plebiscito*, close to the *Porta Reale*, where the Palazzo Pretorio stood (built in 1540), at the end of the broad *Via della Corte*, which still goes from there to S. Sepolcro under another name. The present Palazzo del Municipio is on the site of the latter. The celebrated "*Disfida di Barletta*," the challenge given by eleven Italians to eleven French, fought near Corato by thirteen of each nation, in which the Italians were victorious, took place in 1503, when it was besieged for seven months by the French. While Lantrec was in Apulia, Barletta was sacked (1528). Afterwards Renzo da Ceri, determining to hold it for France at all hazards, levelled to the ground

showing Burgundian influence. The nave has six bays with a pointed arcade and one further to the west as narthex.

The piers are square in plan, with the addition of engaged columns east and west and a pilaster of the nave which runs up to the triforium. The caps are roughly carved with a good deal of variety, entwining forms in some cases and in others volutes and rows of leaflets turning over. Some of the abaci are heavily moulded, some slightly. The vaulting is quadripartite throughout. The section of the nave arcade is a simple torus within an un-moulded arch, while on the other the angles of the inner arch have little hollows stopped just above the cap. The arms of the crossing do not project beyond the apses, which are three in number and bear a shallow-pointed arcading on the exterior, which appears also on the south side. The small windows of aisles and clearstory are round arched. The central window has the usual Apulian beasts on corbels. A pointed window is also in the southern apse. The north door is pointed, with a gable surmounting it, but the west end has been modernised. Over the crossing is a later tower, where the arches were kept, dated 1784, but below it the earlier octagonal drum shows angle pillars corbelled out apparently supporting squinches. The tower was pulled down in 1737. The narthex divided into three bays, which continue those of the nave and aisles and are connected with them by pointed arches of two orders, the middle tier springing from low pilasters. The upper tier has an arcade of five arches, the central one larger and flanked by piers, the side ones with corbelled columns between them, and above the flat-pointed arch below is a queer little monster supporting a corbel table, which M. Enlart says was to provide space for a small altar on the floor above, an arrangement which was frequent, but has not often been preserved. A similar arrangement occurs in the tribune of La Madeleine at Vézelay. In the chapel are some remains of Byzantine wall paintings. The side bays have each a door opening on to the flat roofs of the aisles. An open porch with a single square vaulted bay formerly projected from the centre of the west front, but has now disappeared with the exception of the shafts on the wall from which the lateral arches sprang. The masonry of the vaults is brought to a uniform slope and covered with roofing tiles. The font is like a great circular cap set on a base much too small, round it are eight corbelled arches, with the symbols of the Evangelists and bosses alternately below them and five-pointed stars in the spandrels. Pine-cones and gourds appear in the carved ornament. It had a dome-shaped cover like a Swiss dome added during the Renaissance period. M. Enlart says that two towers were projected for the west end which never reached the level of the roof. The decoration is Romanesque, and it more nearly resembles the buildings of the Seine and Loire than those of the Yonne, Oise d'Or, and Nièvre. He holds a brief for a French origin and remarks that "the beauty of the sculpture reveals a French hand." It seems more probable that the French influence is indirect, since it was built by the prebendaries of the Holy Sepulchre at Jerusalem, and that the architect was a member of the order who came from Palestine.

A church of S. Andrea was consecrated by Gelasius I. in the VIth century and was then dedicated to S. Peter and later to S. Salvatore. A door remains, with carving of the end of the IXth century signed "IncoLa Trancensis sculpit simeon RagVseVs. Domine Misere." The same sculptor who dates his work at Monte S. Angelo 895. Herr Mothes points out that H R. is accepted as meaning forty, the larger letters of the inscription form a chronogram giving the date 900. The tympanum shows Christ with the Virgin and S. John and angels at each side beneath a rich arcade, but on the jambs are figures of saints in low relief with Byzantine decoration above and below. The church was given to the Franciscans in 1532. A Gothic door of the Angevin period still remains in S. Stefano, and in the main street is the Gothic Palazzo Bonelli of the XIIIth century, the preservation of which is due to the Ufficio Regionale, which refused to comply with the request of the municipality to be allowed to destroy it.

Canosa, the ancient Canusium, stood on a prolongation of the Via Appia. Horace says it was founded by Diomed and calls its inhabitants bilingual. It was a Greek colony with the name of *καλονισιον*, as shown by coins

found on the site. Livy notes it as the refuge of the Romans who escaped from the field of Canne, and it appears to have been one of the most magnificent and cultured cities of Italy from the cameos, objects of gold and silver, Greek and Roman coins which have been frequently dug up, as well as fragments of columns, architectural carvings, and mosaic pavements. It was much larger than the modern Canosa, which stands on part of its site. The remains of constructions are slight and sometimes scarcely recognisable, but the circuit of the walls was nearly nineteen miles. An aqueduct brought water to the city from twenty miles away. On the road towards Egnatia the constructional part of a triumphal arch exists, believed to have been built in honour of Trajan, though the common name of it—Porta Varrese—attributes its construction to Terentius Varro, and among the ruins are some which appear to have formed part of an amphitheatre. The city fell under Roman domination about 300 B.C., and a colony was established there. A list of the names of the Romans sent to form this colony, with their rank and employment, was found near the church of S. Sabino, engraved on a tablet of brass, and was sent to the museum at Naples. The "Campi di Diomede" stretched along the Anfidus between Canusium and Canne. The bishopric was established before 347, in which year a Bishop Stercorius of Canusium appears at the council of Sardis. According to some, S. Felix; to whom there is an altar in the cathedral, was the first bishop; certain names are S. Probus (470), S. Rufinus, S. Memor (about 500), and S. Sabinus (514-66); the last has supplanted S. Peter as patron saint. The city was destroyed by the Saracens in the VIIIth century, and most of the population fled to other places, but it was rebuilt 963, and, though the body of S. Sabinus was taken to Bari and the cathedral, as the seat of the archbishop of Bari and Canosa, was transferred to that city in 1902, the church of Canosa retained its

independence under the government of a prelate, called "prevosto." In 1818 it was joined to the bishopric of Andria. The castle on the hill, built with great stones taken from the ancient Canusium, is in ruins (restored by Charles I. in 1270), and the city, which was founded under it in the Middle Ages, has descended towards the plain. It now has about 13,000 inhabitants. Under the Normans, Robert Guiscard, Roger, Boemond, and William his nephew, it regained prosperity. In 1643 Filippo Affaitati of Barletta bought it from the Grimaldi of Monaco, but his creditors afterwards sold it for 48,000 ducats to Fabrizio Capece Minutolo. It has suffered much from earthquakes, especially in 1361, 1456, and 1627. In 1851 more than 370 houses were thus ruined, and in 1857 a good many people lost their lives.

A mediæval gateway ornamented with remains of antique reliefs is called "Porta Diomedis." The ancient cathedral of S. Peter is in the now ruinous city and practically nothing remains of it but the plan. The newer one, S. Sabino, was built between 1093 and 1100, according to local tradition by Boemund Prince of Taranto and Antioch. It was consecrated by Paschal II. in 1101, as an inscription at the entrance of the sacristy records. The church is a Latin cross in plan, and is entered by steps descending beneath a western tower, which was rebuilt in 1825, for the level of the ground has risen considerably. The nave is roofed by three flat cupolas, which rest on pillars set in the angles of the bays. Six are of verde-antico, valued by Vanvitelli at 18,000 ducats, each, and two of the four in the north transept, which are of granite taken from ancient buildings, bear Corinthian caps of the Norman period, worked in white marble. Between the columns the nave walls are pierced by two low arches on each side. Outside the low vaulted aisles are three modern chapels. The plan with the cupolas shows direct Byzantine influence and that this is probably the



Fig. 2. Arch beneath Campanile; S. Maria Maggiore, Barletta.



Fig 3. Tomb of Bohemond, Canosa.

most ancient church in the Terra di Bari. M. Bertaux wrote in 1897 that the celebrated bishop's seat and ambo were put aside into a dark corner, while the nave had a gaping opening showing rough ends of vaulting, beneath which steps descended to the crypt; and this is still the condition of things. The seat shows considerable resemblance to that at Bari, and is older than the present church. It bears an inscription on the side:—"*Ursus preceptor Romualdus ad hoc fulcrum*." Ursus was archbishop of Bari and Canosa between 1078 and 1089. The seat rests upon two long-bodied elephants, which have arabesques on thighs, heads, and breasts. In front are two peacocks, and on the sides two griffins, flanked by heads projecting on a lower level. On this level the front has a central cross and scrolls at each side. Above each upright are ornamental balls. They are ornamented with narrow rows of diamond-shaped inlay. The top ball is surrounded by tall acanthus leaves and is carved like a fircone. The wings and tails of the other beasts have been painted red at some time. The ambo is so much like it that it is generally considered that they must be by the same hand. It stands on high octagonal pillars. The curved projection in the centre has the usual eagle on a man's head, the head is cap to a pillar, and the projection is panelled, the book-rest projecting above the eagle on a lion's head. There is a round arch below with inlays and a little carving. The caps look very Oriental in design. The church has a fine pavement of marble also. It seems possible that the building is earlier than the received date. The seat of Ursus seems to prove that either there was another church here in his time or that the

construction of the present church was considerably advanced. The outside of the nave walls shows a Byzantine mode of construction—alternate courses of stone and triple rows of bricks. The plan is nearly that of S. Mark's, Venice, the difference being that the fifth cupola is at the end of the nave instead of being east of the crossing. The cupolas have no drums, but rest directly on the columns, and M. Bertaux says that the only other group of cupolas without pendentives in Apulia is in the ruined church of S. Maria di Calena on the point of Monte Gargano, an early XIIIth century church. The cupola over the crossing has pendentives, it is true, but it was probably rebuilt in 1699.

Against the south side of the church the tomb of Bohemond is built (Fig. 3). He died in 1111 at Antioch, and his body was at first placed in S. Sabino. His mother, Albareda, built the sepulchre. It has a portico, which was covered with two pyramidal roofs terminated with balls, now removed. It consists of three thick pillars of violet marble with caps of white marble, two of them imitated from the Corinthian, while the third has a cushion cap decorated with vesicas. The chapel is rectangular, with an altar niche to the east. The external walls have shallow pilasters and an arcade of four semi-circular arches (to the south) with carved caps but no bushes, though there is a base between them, in the second of which is the door. The east side has two arches, and the apse and the west side three arches. There is a little cornice and sloping roof up to a square base, from which the octagonal lantern starts. This has columns and caps at each angle, a little crowning cornice, and a cupola

roof, replacing the pyramid which shows in the older drawings of the monument. The interior has two very small bays crossing each other, made by two round arches resting on three rough Pentic columns with roughly-cut caps. The two first columns are a continuation of the portico, and suggest that it may perhaps have been originally a chapel or baptistery. The walls are plastered and there is no altar now. The bronze doors are signed by Ruggiero di Melfi, who is also credited with the architecture. One leaf is wider than the other, as is the case at Anagni. That on the left has three rosettes in the panels, which are divided by bands of elaborate ornament. In the highest was inlaid a Madonna and Child, as shown by the inscription. The middle one had a lion's head, and the lowest inlaid ornaments. Between them verses are engraved in praise of Bohemond. The right door has at the top and bottom roundels with ornament, birds, and beasts. The middle compartments contain two kneeling young men in the upper, and in the lower three male figures. In each case the lines are traced and the flesh was filled in with silver, which disappeared during the French occupation. The inside of the doors has the same inequality as the outside, one leaf having foliage in relief, while the other has none. The design of the ornament shows strong Oriental influence, and it is disputed whether Roger was a native of Amalfi or Melfi, and the fact that Molfetta also appears in chronicles as "Melfi" adds to the uncertainty. F. H. J.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The usual fortnightly meeting of the Royal Institute of British Architects was held on Monday evening at No. 9, Conduit-street, W., Mr. J. Belcher, A.R.A. (President), in the chair.

Deceased Member.

Mr. A. Graham, Hon. Sec., said he had to announce the decease of Mr. Francis Edward Caws, Past-President of the Northern Architectural Association. Mr. Caws passed the Associates' examination of the Institute, and was admitted a Fellow in 1893. He was the author of various contributions to the *Journal* on subjects of artistic and scientific interest in connexion with architecture. Mr. Caws was responsible for much architectural work in Sunderland and the neighbourhood, and designed and carried out the piers at S. V. V. Isle of Wight, and the suspension bridge across the Wear at Stanhope. A memoir of Mr. Caws had been contributed to the *Institute Journal* by a Vice-president of the Northern Architectural Association. He had to move formally—and he knew it would have their tacit consent—"That the Institute do record deep regret at the loss of an esteemed colleague, and that a letter of sympathy and condolence be sent to his family."

Garden Architecture.

Mr. Mervyn Macartney then read a paper, illustrated by lantern views, on "Garden Architecture," of which the following is an abstract:—

The author said that recently an subject had been so exhaustively studied of late years as that of garden architecture, and hence controversies had been waged over the rival advantages of formal and informal gardens. At present the former held the balance. He hoped that in this case fashion would prove constant. Citing some ancient instances of formal gardens, the author quoted at length the graphic description given by the winner Pliny of his villa garden, which was a well-proportioned portico, in front of which was "a sort of terrace, embellished with various figures and bounded by a box hedge, from whence you descended by an easy slope adorned with divers animals in box, answering alternately to each other, into a lawn overspread with the soft acanthus; this is surrounded by a enclosed with tinsle evergreens shaped into a variety of forms." Later, there were the formal and natural schools as represented by Lucullus and Martial, fighting the "battles of the style" even thus early. The author confessed he could not see why, in the construction of a garden, human thought and labour should be those on the most interesting examples had been cases in which the greatest skill had been expended. Not that the larger the amount of skill and labour employed the better the result. It was possible to create the best result with the least skill.

failure. In the case of Versailles there was a sense of enormous effort with little result. Vast terraces, lagoons of water, and huge fountains produced no satisfactory result, only a sense of futility, a useless expenditure of labour and money without adequate return. Turning to some English examples, the author said: "Montacute, to my mind, is the most satisfactory—it fits the position, and yet, like so many other English and British examples, it owes little to site. It is comparatively flat, and there is no distant view. What charms it is of its own making. So it is with Wilton and Melbourne, and herein lies a difference from the Italian examples. They generally owe a great deal to position; perched on a hill you have vistas of distant country framed by towering cypresses into delightful pictures. Yet in the British examples you have a distinct sentiment; it is of a garden that you love—a charm that can only be gained by the employment of rare knowledge and design. There is a subtle charm about the terrace at Haddon Hall and the bowling green at Bramshill that is absolutely absent in Trentham or Versailles. There is no great striving after effect. I would rather be the designer of Montacute than Versailles—I will go farther, and say of the Haddon Hall terrace rather than Versailles. Indeed, there are few of the vast garden conceptions that please me. Chatsworth bores me, so does the Crystal Palace; yet they are hid out on grand lines—they are meant for spectacular performances, and unless all the fountains are playing the effect is dismal as an empty theatre." The gardens placed on hills give the architect an opportunity of showing his skill in designing terraces, balustrades, and steps. Some of these in the Italian gardens are wonderfully ingenious and beautiful. Water is part of the garden design was very largely taken into account by the Italians. Garden flowers were no part of the scheme, and scarcely came in at all. Architectural features and evergreen trees were the two principal factors in considering the effect to be produced. Antique fragments, such as vases, urns, capitals, altars, etc., were largely used, some as cisterns, others as receptacles for plants, etc. These were useful to lighten up the sombre depths of the elix groves, and were suitable in that climate; but here they looked odd and unhappy. The author exhibited lantern views of various notable examples of Italian gardens to show what masters in their art and craft their designers were. Remarkable on the essential differences between English and French, Italian and Spanish gardens, the author referred to the beauty of the English lawns. Abroad they could only be obtained by great care and attention, and are a source of trouble and difficulty. Shade, too, in these countries was of vital necessity. Here it rarely was the case, and many of the pergolas that people were so enamoured of were nasty damp places totally unfit for the climate. A third point was the effect of strong sunlight and heat. A marble seat here was a very uncomfortable place to sit on. It was generally damp and cold, and therefore unsuited to our climate. The author next dealt in considerable detail with home gardens, showing examples of different ways of treating some of the many factors that make up the sum of an architectural composition—such as terraces, steps, etc. As regards the width of terraces, there is more chance of failure by putting a narrow terrace than a broad one. Generally speaking, the width is largely governed by the amount of surplus earth excavated from the foundations. If the site is a very steep one the terraces are usually narrow. Balustrades admit of much play of fancy. The turned baluster is very commonly used, and the author favoured the widely-spaced English balustrade. Quaint terminals on the piers, and also pavilions at intervals and at the corners, are introduced to vary the monotony of lengthy balustrades. Montacute is a case in point; the play of fancy in this design is very happy. Other architectural details referred to and illustrated were gate piers, fountains, ponds, sundials, pavements. Summing up his own views on the subject, the author said that if he were called on to lay out an extensive garden in England he should avoid geometrical lines—those unhappy compositions with shapes like tadpoles, kidneys, etc. Neither should he embark on topiary work on any great scale. Hedges of yew, privet, hornbeam, etc., were charming adjuncts to a garden, and here and there trimmed shrubs were useful; but he could not admire Levens, Elvaston, or Blickling. As our country is the most beautiful in the world,

he would take advantage of every opportunity that offered of incorporating it into his scheme. Supposing he had not merely the laying out of the site of a garden, but also the choice of its position, he should not choose a lofty hill with a panoramic view. From the result of his experience he was certain that this was a mistake: foreground and middle and distance was wanted—human interest. Avenues of trees bordering a long stretch of water, as seen at Fontainebleau and Hampton Court, pleased him more than the terraces and beds of Versailles. One could not disserve oneself from one's climate; and though he vastly admired the superb cypress, ilex, and arbutus groves of Italy, he was as fond of our deciduous trees, even in winter. He did not care very much for the appearance of evergreens in England, except the yew and holly: their foliage had a hard metallic look that seemed to indicate that they were not happy in their surroundings. To his mind the detail, invented and perfected in this country, of terrace walks, balustrades, etc., was preferable to that of any other country. Further, he would avoid marble, as looking too white and staring. A very fair surface can be got in cement (concrete), provided too much sand and water is not used, and that it is not rammed down to well; otherwise, the sand and cement will come to the surface and show the lines of the plank strutting. Dwarf walls of brick laid dry assume an appearance of age very rapidly. The author's conclusion was that we have nothing to learn now from foreign examples, that we have enough in this country to guide us, and that the best are those which are not slavish copies of other lands.

Mr. T. H. Mawson, in moving a vote of thanks to the reader of the paper, said he felt that the paper and the examples showed how much there was to be learned from the study of gardens. He noticed one thing, which was that, whenever Penshurst, or any of the places to which the late Geo. Devey lent his great abilities were shown, his name was seldom given in connexion with them, and he was rather sorry that when the view of Penshurst was shown Mr. Devey's name was not mentioned, because he was a wonderful and charming designer. He would like to say one thing, which was that, in designing a garden, they must try to consider the matter from the centre rather than from the circumference, and they found that the centre really lay in their client. They had first to consider him and to humanise the circumstances with which they had to deal, so that they might accord with his requirements; and that the house and the landscape, being considered together, they could say one had been suitably received into the other. He was afraid there was some fear that in considering the garden rather than from the point of view of detail than from the design in mass they lost what ought to be the chief characteristic of the design. He was perfectly sure that Mr. Macartney thought so, too, and that in giving so many details instead of plans and the larger conceptions connected with gardens he had in his mind the helping of the younger men of the profession. Still, they must first of all consider the garden in its larger aspect, and, having decided upon the composition as a whole, finish it in detail, and then they would arrive at a scheme which was good from the centre to the circumference. They must never forget that the first thing to consider was the opportunities which the site afforded, and that brought him to another point, especially in connexion with Montacute, where they were told there were no distant views. Here the object of the designer was surely to create a world immediately around the house, but in other districts, and particularly in Windermere, where he resided, they saw much that was beautiful in nature on the one side and the house on the other, and what they had to consider was really the linking up of the two. Wordsworth was not only a great nature poet, but he had also much to do with the design of many of the gardens in Lakeland, and he had noticed that, whenever Wordsworth directed or advised in the design of a garden in this district, what he always tried to do was to weld the rugged and pastoral into one fine picture. In the case of Montacute they had to produce a world, but in the other case there was a world already existing, or a number of worlds, each one linked together. He felt that it was by taking the house as a fixed point on one side and the landscape on the other, also as something fixed, and by welding together the two into a

homogeneous scheme, that they would realise their best effect. He had seen one garden designed by Mr. Macartney, and he had realised far better than anyone else whose works he had seen how much there was to do in linking up the two, and it was owing to his having seen the satisfactory result that made him refer to the matter in this way.

Colonel Prendergast seconded the motion, and remarked that he was old enough to recollect when it was considered that when the last slate was put upon the roof the architect's business was ended. Nowadays they were asked to design a great deal more than that, and the subject discussed that night was one which must come before them if only times became better. It was rather a question of pounds, shillings, and pence what they did in the way of architecture or the architectural laying out of gardens. With regard to the paper, he must confess he was absolutely at issue with the author on the question of the geometrical laying out of land. Nature required no help from them, it was true, and would give all the charm and delight necessary, but geometrical laying out was absolutely necessary. He would ask them to go no further than Hampton Court Palace and see what Dutch William did there. William laid out the grounds which were now the glory of the Metropolis. They were not chucked here and put there as people did now who thought they could draw up anything without any rules or principles whatever. There was not an avenue at Hampton Court which was not carefully laid down on architectural principles. William did not act for his own period, and nature had filled up the gaps, and now they had one of the most enticing things of its kind on a very inferior site. He was sorry to differ from a gentleman who had done such service in bringing the matter before them, but he could not give way to that insular interpretation which had been put on these great subjects. He was aware that in that room they had had from the greatest of their architects a lack of appreciation of great buildings, and it was nothing new to him to find people who said that Versailles was not to be looked at. They had their own specialities in that little land, and they should make the best of them, but do not let them go about the world contending that nobody knew anything but themselves. He would like to know one thing. On the border of the Thames there was a place called Beaumont College, which was the house of the conqueror of India, Warren Hastings. He would like to know whether the garden of that house, to which allusion had been made, was the original garden of the period of Hastings or whether the allusion was to some new addition which had been made to that interesting house.

Mr. F. R. Farrow said that one thing occurred to him in regard to the architect's connexion with the garden, and it was that they seemed to forget that a garden was a place for growing things. He felt that their work as architects ought to be confined simply to the provision of the frame in which things might grow. If they adopted that as the basis of their work they should abstain from much of the formal cutting of hedges and distortion of nature into geometrical form, which he thought was one of the points that Mr. Macartney objected to. As architects he fancied their work would be done when they had laid down the general lines of the mass, and then they should turn to their friend Mr. Mawson and ask him what plants and shrubs should be planted in order to produce a succession of colour during the different months of the year, so that the garden might be not a joy for a short time, but for always. The architect had first to provide the frame and such adjuncts as might be necessary to complete that frame. In an English garden, which was very different from an Italian garden, they must have opportunities for shade and for shelter, and that gave an excuse to architects to put in summer-houses and arbours as part of the scheme in framing a garden. He agreed with the remarks of the author as to the introduction of sculpture in English gardens. Sculpture, to be of any effect in the form of single figures, must be more or less nude figures, and nude figures in white marble in an English garden against a background of dark green produced one of the most distressing effects one could possibly imagine. Therefore in laying out a garden he felt that sculpture was one of the things they should avoid unless they could induce their client to spend sufficient money

to build a loggia or museum in which to place the sculpture.

The Chairman said that with respect to gardens generally they afforded the architect opportunity for linking his work with nature. The rigid geometrical lines of architecture would come rather suddenly on nature left to itself, and the garden was the opportunity of pushing out the tendrils, as it were, and linking the building to the soil—the opportunity of softening the harsh lines and bringing them into unity with the more rounded and undulating forms of nature. Mr. Macartney had drawn their attention to one thing which he thought was important, and it was that architectural details in connexion with gardens should not be too refined, because they were not in scale with nature. There was great truth in that, and probably it had something to do also with the size of gardens, because it was all a question of proportion, and he felt that gardens should not be unduly extended or they would be out of proportion with the house. They simply wanted to link the house with nature, and the garden should not be extended too great a distance from the house. Another thing which occurred to him was the beauty and advantage of screening certain parts of nature. The quiet, retired beauty of an enclosed garden was known to most of them—the being able to have peeps from one screened part to another, and of being able to frame in certain beauties of nature. It was one of the difficulties architects had in dealing with their clients. It was a difficult matter to persuade the client that screening off of some portion of his garden was an advantage, for the client liked to see it all at once. Whereas the great charm was to see a portion at a time. He thought Mr. Macartney had been misunderstood in some respects with regard to his views on formal gardens, and he believed he was in sympathy with the formal garden up to a certain point.

The motion was heartily agreed to.

Mr. Macartney said with regard to Penshurst, he knew it very well, and he fancied that Lord de L'Isle had more to do with the design of the gardens than Mr. Devey. He believed that Lord de L'Isle wrote to Mr. Blomfield about the gardens being ascribed to Mr. Devey, and said that he was the author. As to Beaumont College, there were photographs of that in the room, and they were the work of Mr. Bentley. Colonel Prendergast had mistaken him about the laying out of a garden. He was quite in sympathy as to its being geometrical, but he did not like a carpet garden, and that was the point at issue. No doubt they were used largely in Italy because they had no flowers, but in England they had flowers. He knew that William Morris had something very pertinent to say about the laying out of a garden, and he was a man able to speak about the correct management of colour. Mr. Farrow alluded to the garden as being a place for growing things, and that was excellent, but the thing to do was to incorporate the surrounding country as far as possible, and have vistas. There was a great deal to be done by leading the eye from the immediate garden to the surrounding country. It need not be very extensive, but anything which gave them food for thought, and made it poetic, was always interesting. Mystery was always interesting, and this was achieved by the screening off of portions of the garden.

The Chairman announced that the annual general meeting would be held on May 1, when the annual report would be submitted for adoption, and other business would be proceeded with. The Council, at that meeting, would submit for adoption the Institute paper on the conduct of competitions, as revised by the Competitions Committee.

CHILDREN'S CONVALESCENT HOME, ST. ANNE'S-ON-THA-SEA.—The Children's Convalescent Home at St. Anne's-on-the-Sea, which has been built by Sir John Thursby, was opened on the 11th inst. The home is fitted up for ten boys and ten girls, and it has dormitories and a playroom. There is a frontage of 165 yds. to the high road. Mr. Thomas Muirhead, of Manchester, is the architect for the work.

FREE CHURCH HALL, WINWICK.—On the 6th inst. the new Free Church at Winwick was opened. The building will accommodate 200 people. It is built of red brick with slated roof, and its dimensions are 50 ft. by 25 ft. All the woodwork is pitch-pine, with pitch-pine dado, the floor is composed of wood blocks. There is an entrance porch, vestry, and offices. Mr. G. H. Catley, of Bristol, was the architect, the builder being Mr. H. Fairclough, of Warrington.

BRITISH SCHOOL AT ROME.

The third open meeting of the British School at Rome for the present season was held in the library of the School, on Monday, April 3, Professor Pelham, the President of the Executive Committee of the School, being in the chair. His Excellency the British Ambassador (Sir Edwin Egerton) was present, and the meeting was also attended by archaeologists of our own and other nations, and by British residents and visitors to Rome.

Mr. Thomas Ashby, junior, the Acting Director, read a paper on Monte Circeo, the promontory which rises in solitary grandeur from the coast of Latium, which is otherwise flat and monotonous. It looks, indeed, from a distance like an island, and must have been an island once, but at a remote period, when the general sea level was considerably higher than it is now. Tradition, even in ancient times, made it the dwelling-place of the enchantress Circe, whose name it still bears; and Circe was certainly worshipped there—probably upon the highest peak, which rises to 1,775 ft. above the sea, on one side almost sheer, and has upon it ruins which may well be those of the substructures of her temple. At the time when this was the frontier of the dominion of Rome a colony was settled here (as one version has it, under Tarquinius Superbus, while the more accredited date is about the beginning of the IVth century, B.C.) as an outpost against the Volscians. The ruins either of this colony, or of a still earlier town, lie under the modern village of S. Felice Circeo at the eastern extremity of S. Felice Circeo, the *enceinte* of which is built upon rough walls of so-called Cyclopean masonry; and these are, it seems, connected by walls ascending the mountain side with a citadel on the summit of the ridge, which is built in a rather more careful style—very fine Cyclopean work on the outside, the blocks lending towards rectangularity, and being finely jointed with dressed faces, though on the inner side of the wall the blocks are left comparatively rough, and are not well jointed. Such masonry is generally used for terrace walls, but here we have a rare instance of such a wall standing free, and, in order to give it stability, it increases in width considerably towards the base. The site of the Roman town at the end of the Republican period, however—whether it originally stood on the height or no—was to the north of the west end of the promontory, by the shore of a salt-water lake, used now, as probably in Roman times, as a fishery. Here are the remains of immense water reservoirs and other buildings half-hidden by the undergrowth. Several villas, large and small, are dotted over the promontory itself, and the wondrous beauty of the situation evidently attracted the Romans of the Empire—Domitian had, we are told, a villa there.

Mr. W. St. Clair Baddeley followed with a paper upon the ruins of what may well be a hitherto unknown temple in the neighbourhood of the villa of Hadrian, not far from Tivoli. On the south-east of the villa proper, upon a hill called the Colle di S. Stefano, are the remains of a group of buildings which have up till now been generally considered to belong to it, but which the evidence of the fragments of an important inscription recently discovered there proves to have been a separate and very large villa, belonging to the Vibii or the Plancii Vari, though contemporary with the Imperial villa hard by. Its importance is shown by the fact that immediately below it the ravine is crossed by an enormous viaduct, constructed, it seems, expressly for the use of this villa. Within its precincts is a small isolated building, rectangular in plan, with a rectangular niche opposite the entrance, which is reached by a flight of steps; and close to this edifice a small marble tablet was recently discovered and acquired by Mr. Baddeley, which bears the words LVCV SANCTV—sacred grove. The use of "sanctus" for "sacer," as applied to a grove, is uncommon, to say the least, and both the form and the phraseology of the inscription are of interest.

Plans and drawings were exhibited of several portions of this important group of buildings, which will certainly repay further investigation and study.

PUBLIC LIBRARY, YARMOUTH.—The new free library at Yarmouth, the gift of Mr. Andrew Carnegie, was opened on the 12th inst. The building has been erected from designs prepared by Mr. J. W. Cockrill, surveyor, by Messrs. Carter & Wright, builders.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION

The last meeting of the session was held at No. 18, Tufton-street, on the 12th inst., when Mr. A. N. Wilson read a paper upon "Village Churches."

He commenced by remarking that in these days of depopulation of rural districts an architect seldom had the opportunity of designing a village church in its entirety, and he trusted that the attempt now being made to get the people back to the land would remedy this state of things by creating a demand for more churches. The speaker then proceeded to trace the history of the village church from its earliest inception to the present day and showed how intimately it was bound up with the village life in the past, and he emphasised the point that, by taking an intelligent interest in such history, much good would accrue both in the work of the architect and his pleasure in carrying it out. For this, if for no other reason, he pleaded for such study from the archaeological point of view. A suggestion, which in the ensuing discussion met with general acceptance, was that a record of the history of each church, both in writing and drawing, should be made and carefully preserved among the records in each diocesan registry, and this should be insisted upon by the bishops of the various sees. There were men who could read you the intimate history of a church after an inspection of the building as easily as if written on a printed page, and a compilation such as that suggested would make for a more general diffusion of knowledge, not so much of church history in general, but in an individual sense. Another suggestion, although purely speculative on his part, was the provision of the north door found in so many churches. This, he thought, might have been provided in view of the use, in former times, of the churches for purposes other than religious, and the consequent desire upon the part of the clergy to keep the secular meetings and spirit distinct from the religious, this door being too small for rubric purposes and often built up entirely at a later date. The subject of seating was of more than archaeological interest, for its date of introduction and partial use were instructive from the secular and religious point of view. Mr. Wilson sounded a note of warning in regard to the vexed question of restorations, and pointed out that, whereas an architect designing a new church could start unhampered, the restorer had to deal reverently with a storehouse of historical relics, and his fear of diminishing by the slightest degree the glamour was apt to turn him into a mere antiquary. This was a mistake, and an architect should, in his opinion, try to be "modern," and not a slave to tradition. Future generations should read the history of the church as well as those which preceded it. Such questions as the provision of organs and vestries, heating, lighting, and seating were matters which now much occupied us, but which did not much trouble, if at all, our forefathers. He deplored the incongruity in the introduction into old village churches of the highly ornamented and coloured reredos so common in these days, and thought some simple hangings much more to be desired. He also regretted the want of religious atmosphere in modern work, and attributed it in great measure to the overloading of churches. In conclusion, he showed how sketches on the blackboard, by means of which a knowledge of the history of a building and the careful examination of it in detail led to the solving of what, without it, would have remained a perpetual enigma.

Mr. L. Ambler, who opened the discussion, proposed a hearty vote of thanks to Mr. Wilson for his fascinating paper, full as it was of historical research and put together with much literary skill. He quite agreed with Mr. Wilson in regard to the increased interest and good accruing from a careful study of church history from the antiquarian standpoint. He thought that the building of village churches was perhaps of not quite such rare occurrence as Mr. Wilson suggested, and, to instance this, he would mention the many old villages which had sprung up during the last few decades, and there were other industries and villages in addition growing up in various parts. He was not quite clear as to Mr. Wilson's remarks in reference to the desirability of being "frankly modern" in present-day design. It seemed to him that with present-day arrangements and him that with present-day arrangements and modern, even though one tried to be "frankly spirit and tradition of the past; but he strongly deprecated the attempts at originality.

had recently been seen. The glamour of old work could only be obtained by age, he thought, and no amount of skill in design could effect this; he gave the reader of the paper as to the governing of planning by modern requirements, but he thought that suitability of a building with regard to its surroundings was too often lost sight of. As to the amount of light admitted to a church, he pointed out that architects usually designed the windows with a view to their being filled with stained glass, which would diminish the light considerably. Regarding seating and other wood fittings, he was of opinion that most of the architects of the last Gothic revival period made a mistake in attempting to design XIIIth century woodwork, of which there were few, if any, old examples. He thought that the use of arched went a good way towards imparting an atmosphere of mystery, and it took off from the barnlike appearance of a building.

Mr. P. J. Turner, who seconded the vote of thanks, in a short speech said that the present prevalence of agricultural depression was to be regretted the most as it militated against the most necessary upkeep of the churches in country districts. As to Mr. Wilson's suggestion of compiling the history of the various churches, he was glad to say that he knew of one body—the Suffolk Archaeological Society—which had taken up the subject wholeheartedly. He agreed with Mr. Wilson as regarded the amount of light in modern churches, and thought that the cathedral at Westminster was an example where it had been treated successfully. He thought that the use of an east window filled with clear glass was a mistake.

Mr. R. H. Weymouth said he believed in the help derived from the spirit of tradition, and as church history was a most powerful factor in upholding this, he strongly advocated a study of it, and he thought Mr. Wilson had no need to apologise for taking up the question of archaeology in his paper. Personally, he believed in getting plenty of light into a church. A point which he believed most influenced planning today, and which did not trouble our forefathers, was one of cost of materials.

Mr. Mears differed from one of the speakers inasmuch as he knew of one church where the internal walls were treated with plain whitewash, and yet the interior was very satisfactory.

Mr. A. H. Belcher anticipated a more practical paper, but, after hearing Mr. Wilson, he was glad he had been disappointed. The paper had produced as an effect upon him the impression that restorations were at all costs to be avoided, and the building of an entirely new church advocated. He did not quite agree with Mr. Wilson as regarded the rerodded question, as he knew of some successful examples.

Mr. H. Gregory Collins (Chairman) advocated a careful study of church history, for, whilst basing directly upon the practical side, it took us away from office routine. As having reference to Mr. Wilson's "frankly modern" remark, he thought that Mr. Norman Shaw's church at Chiswick and Mr. T. G. Jackson's at Wimbledon were two excellent examples of buildings adapted to modern needs.

Mr. W. H. Seth-Smith, as Special Visitor, then summed up the discussion. In dealing with the historical side, he said he had been much charmed by Mr. Wilson's way of putting this before them and grateful to him for the practical manner in applying it. Personally, his life had been too busy to allow him to study archaeology deeply, but he had always found great pleasure in dipping into it, and a book he could cordially recommend was Dr. Cox's "How to Write the History of One's Village Church." Referring to the modern side, he thought that the question of cost hampered us most, and had much to do with planning. The influence exercised by the bishops and the Ecclesiastical Commissioners also influenced the matter. Simplicity was certainly a principle to be aimed at, and he called to mind a small church near Blackheath which the Architectural Association visited lately, which he thought a successful example. He agreed with Mr. Ambler that the question of aisles and gangways was an important one, as giving character to a building, but the piers should not interfere with the view of the preacher. He believed that the question of heating and ventilation would have more and more influence church roofing in the future, and quite rightly, as these were matters affecting the health apart from the comfort of the occupants. He thought the provision of a gallery in the west end desirable as securing good acoustic properties, and its

staircase turret gave the architect a chance of making a feature of this part of the building. He quite agreed with Mr. Weymouth as to the desirability of using local materials, as it made for fitness to surroundings, and he believed that many valuable hints were obtained from a careful study of local work. He was also in agreement with him as regarded getting sufficient light for reading. In concluding, he advocated not a slavish copying of old work, but a study sufficiently careful to be of use in having to do with ancient or with new work under modern conditions.

The vote of thanks having been carried with acclamation,

Mr. Wilson in reply said that the point in his paper most requiring explanation was that having reference to his expression "frankly modern." What he really wanted to convey was that the spang of old work was too frequent, and he would like to see the same treatment applied to church design as had been done in our domestic work of to-day, which he ventured to think was second to none in the world. Mr. Wilson answered one or two other queries, and the meeting then terminated.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

VII.—CENTRAL LIBRARY, HAMMERSMITH.

THE concluding or seventh spring visit of the Architectural Association was made to the Central Public Library, at Hammersmith, on Saturday, the 15th inst. The building is the gift of Mr. Andrew Carnegie, and in a limited competition, assessed by Sir Aston Webb, the design of Mr. H. T. Hare was selected for erection.

Although the interior was found to be in an unfinished state, it was at once evident that the principal merit of the scheme lies in the excellent simplicity of plan. A central entrance leads directly into a large lending library, having a news room to the left and magazine and boys' rooms to the right. A simple staircase and landing, with a plaster vaulted ceiling, all sufficient for the purpose, gives access to the reference library and committee room on the upper story. The remainder of the accommodation consists of caretaker's residence, stores, and minor accessory departments.

The difficulty of the problem was to produce a building of the required areas for 10,000, the amount of Mr. Carnegie's gift, and with but slight excess, due to subsequent modification, the architect has succeeded in doing this. Some further change will, we think, be found necessary in the one very narrow entrance, which is to be choked by a patent revolving door. These fittings are useful enough in a hotel, but hardly suited to the demands of the busy entrance to a public library in a borough such as Hammersmith.

The lending library of 30,000 volumes, with its public space, is one large room, wherein the borrowers' counter measures 55 ft. long. The first floor landing and stack-room, which overhang this apartment, are carried by two lattice steel girders, 55 ft. in length, 10 ft. deep, and cased in breeze concrete 9 in. thick; columns are thus avoided in the lending library, which is a great improvement upon the original plans.

It cannot be said that the opportunity afforded by the breadth of the plan in the treatment of the main front. There is massive dignity in the wall surfaces in which the brick and stone materials are wisely kept distinct, but the pediments which emphasise the break at each end of this facade appear to be introduced with but little relation to the detail of other parts of the composition, and the effect of these imported features weakens the general idea which is otherwise honest and vigorous.

Some interesting carving and modelling by Mr. Schenck is to be seen both in and out of the building. The two external stone figures, representing Shakespeare and Milton, excellent of their kind; are, however, too large in scale and too realistic in treatment for the shallow niches which they affect to occupy.

Taken as a whole, the design of the library will do much to exercise a good influence upon the tastes and opinions of the residents in Hammersmith.

THE BUILDING TRADES EXHIBITION.—We may remind our readers that the Building Trades Exhibition, to be held in the Agricultural Hall, will be opened by Lord Windsor on Thursday next, the 27th inst.

THE QUANTITY SURVEYORS' ASSOCIATION.

AN ordinary general meeting of this Association was held on Wednesday, last week, at the Freemasons' Tavern, Great Queen-street, W.C., Mr. Walter Lawrance, President, in the chair.

The minutes of last meeting having been read and confirmed, and the Council's list of nominations for officers for next session having been read, the following gentlemen were appointed to act as scrutineers on the occasion of the ensuing election—i.e., Messrs. G. A. Ovitte, C. A. Kennett, and C. D. Nixon.

Mr. A. G. Cross, F.S.I., then read a paper, entitled, "The Practice of Our Profession and Suggested Reforms."

The author divided his paper into two parts. Part I. was entitled—

A Plea for a Uniform System of Measurement in England.

His object, he said, was to indicate some of the more cogent reasons for the introduction of a uniform system of the measurement and valuation of artificer's work, as the science of quantity surveying was formerly called, and to elicit the views of members thereon so that they might be in a position to frame some practical suggestions for further consideration by the Council of the Association, should this course be considered desirable. The main differences which exist between the Northern system and the London one appeared to be the neglect on the part of those who practice the former to measure many items of labour which most certainly should be embodied in a bill of quantities, to their custom of merely making an item, or, as we should say, "an allowance," for some important labours which should either be numbered or measured. He had seen the following item in a bill of quantities for a building costing upwards of 150,000L: "Allow for building in or cutting brickwork around the ends of all iron and steel joists, built, box and lattice girders, ends of roof trusses, etc.," and to their separation of, in many cases, the labour from the materials, although on this last point they were not consistent.

The length of a bill of quantities supplied by an architect or surveyor practising in the North country was frequently the subject of comment, and one would naturally inquire why, when the work was not measured so much in detail as in one supplied by a London surveyor, should such an imposing document be produced? Probably an explanation was to be found in the fact that in many instances the bill of quantities served also as a specification, and the consequent necessity of separating the work very considerably in order to inform the builder where the materials and labour, of which the quantities were given, were to be used, rendered the repetition of many items imperative.

In an examination of a bill of quantities prepared by a North country surveyor, and on comparing it with a similar document issued from a London office, one was (besides the omission to measure many items of labour) chiefly struck by the following methods of measurement which appeared therein:

The measurement of the labour to hollows in brickwork and plastering.

The deduction of the brickwork in the flues and the measurement of them by the foot run for "labour forming," the number of flues cored and parged being also given.

The Northern system of measurement of the carpentry and joinery differed in many instances materially from the London system, the separation of the labour from the materials in the measurement of the floors and roofs, measuring the former by the yard super, as "Labour and Nails" or "Labour Framing," and the latter by the foot cube, was unknown in the London practice. The labour framing for the roof-trusses was numbered, the extra labour trimming for an opening was numbered, and in the cube timber in the roofs was included rafters, purlins, hips, ridges, roof trusses, and curved ribs, measured by the foot run. Very little labour was expended in the measurement of a staircase, the number of steps, their length, width of tread and rise being given and the wall and outer strings included in the description. The measurement of the founder and smith's work hardly varied from the London method, and although a London surveyor would condemn the neglect to measure the labours on the lead, such as welts, bedding flashing, and copper nailing, and the inclusion of all bends and

joints (including branch joints) in the length of the lead pipes of any diameter up to 2 in., this also applied to the plumber. A London quantity surveyor would also comment on the absence from the painter's bill of any reference to "frames" and "squares," both sides of the windows were measured all over and billed by the yard super. for the painting.

A comparison of the bills of quantities issued by several of the leading London quantity surveyors revealed many important variations in their customs, and leads one to consider whether previous to the encouragement of the extension of the London method it was not desirable to make that system uniform. To name a few only of the items appearing in a bill of quantities upon the mode of measurement of which the views held by some surveyors differ materially from those held by others, there was in the first place the question of the measurement of stonework. As they were all aware, some quantity surveyors still adhere to the practice of measuring the labours upon Portland, Doulting, Bath stone, etc., whilst others merely did so on the Portland stone, and measure other stone including all labours. Again, the system of measuring all stonework irrespective of its description as "stone and labour," was favoured by many surveyors, some of whom bill their stone in one item, and some separate the items as "cube stone" in "plain quoins," moulded "cornices," etc. There was much to be said in favour of a continuance of the old-fashioned and, in his opinion, the best system of measuring all the labours; there could be no doubt that by this means the fairest price was obtained by the builder and paid by the employer; it was more easily billed, and the confusion caused to some estimators by a surveyor's endeavour to separate his items of cube stone and labours so as to make the work on every feature sufficiently clear was avoided. On the other hand, it was contended that sufficient time was seldom allowed the quantity surveyor to take off the quantities, and that the adoption of any system which tends to minimise his labours was to be recommended; there was, in addition, a good deal to be said for an argument he had frequently heard expressed—i.e., "Why should I take the trouble to measure a stone front in the orthodox manner when my neighbour merely measures the work by the foot cube, and in consequence enabled to get through considerably more work in the course of the year than I, with a result equally satisfactory both to the architect (who is, as a rule, absolutely indifferent on this point) and to the contractor?"

The practice of billing the rough brickwork as so many rods reduced brickwork, including all rough cuttings and rough arches, was becoming only too common, and here the difficulty of a contractor arriving at a fair charge for the cuttings was apparent. Rough cutting, according to most authorities, was priced by the superficial foot, and birdsmouths and squints by the foot run, and in the absence of the necessary information on these points the contractor had to guess at the amounts and include in his estimate a sum which would, in his opinion, cover the cost.

Mr. Cross then gave an example upon which the method adopted by those present that evening would, he said, certainly vary—i.e., in regard to the measurement of glazed brick facings. "What is regarded as the custom? Do the majority of quantity surveyors simply take the sight measurement of the area covered by the work and allow nothing for bonding in at the internal angle, or is it the general custom to measure an additional $\frac{1}{4}$ in. by the height of each internal angle and include this in the super? My own practice is to measure the height of each angle by the foot run, and to bill it as 'extra on best quality white glazed facing to internal angle for bonding.' The foregoing instances of the varied systems practised by London quantity surveyors could, of course, be very considerably increased. I have, however, I think, given you enough examples to convince you all that the London practice, although infinitely superior to any other, is neither perfect nor uniform.

It is a very difficult matter to convince a professional body, more especially those members who are, by reason of their seniority, recognised as its leaders, that any reforms are essential. I do not suggest that anyone of our leaders would maintain that the system which he adopts is the only correct method and is not capable of improvement (he would, indeed, be a bold man who would venture such a rash argument), but I do suggest that he

would argue that his methods have lasted his time and served him very well, and that his bills of quantities differ in mere matters of detail only from those issued by his contemporaries. I believe, however, that a large majority of quantity surveyors would be willing to give the most careful consideration to an inquiry whether the time has not yet arrived when some endeavour to reconcile the differences which exist in the method of measurement adopted in the bills of quantities issued by one surveyor from those issued by another should be made.

Is it not our duty to provide a recognised London system of measurement which all of us would adopt, and upon which our examinations would be based, previous to any endeavour to make that system uniform throughout England? My own view is that this object would best be attained by the publication by our Association of some regulations for the measurement of the materials and labour in the various trades similar to that pamphlet issued by the Glasgow Institute of Measurers, and I have one more argument to use in favour of such a publication. In view of a recent decision upon a question as to the manner in which a bill of quantities had been prepared, some amendment to Clause 12a in the Conditions of Contract (where quantities form a part) issued by the R.I.B.A. has been suggested, it is, I understand, proposed to insert the words "or omission from," so as to make the clause read as follows:—

"Should any error appear in 'or omission from' the bills of quantities other than in the contractors' prices and calculations, it shall be rectified, and such rectification shall constitute a variation of the contract, and shall be dealt with as hereinafter provided."

To my mind, the insertion of those three apparently inoffensive words opens up a fine field for arbitration and litigation, as the question "what constitutes an omission from the bill of quantities?" will very frequently arise.

Upon the question what constitutes an omission? opinions will vary very considerably, the neglect to finish the rake of a roof, thereby dividing the amount of slating, boarding, battening, etc., by two, is definite and unanswerably an "omission from" a bill of quantities. On the other hand, is the neglect to measure certain items of labour which many quantity surveyors would measure an omission from the quantities? Possibly as good an illustration to explain my meaning as any I can give is the question of the measurement of an internal angle in glazed facing work.

A quantity surveyor acting for the builder would claim to have the additional $\frac{1}{4}$ in. up each angle included in the measurement, and his contention would meet with the support of some leading members of our profession who adopt this course, whilst his opponent would argue that the actual sight measurement only of the surface covered should be measured, that he has done so, and that the builder has no claim for an extra by virtue of an "omission from" the quantities in respect of this item. In the absence of any recognised system of measurement to which reference should be made on all questions in dispute, by whom are questions such as the foregoing to be decided?

Suggested Reforms.

In the second part of his paper Mr. Cross dealt with reforms in the employment and payment of the quantity surveyor. He said:—
"The system under which a quantity surveyor is paid for his services to my mind stands greatly in need of reform. The practice (almost universal in the case of private works) of a quantity surveyor's being paid through the builder is one, the wisdom of which is very much open to question, and is probably a survival of the time when he was employed by the builder frequently without the knowledge of the architect, and in nearly every instance without the knowledge of the building owner. A quantity surveyor, whether employed direct by the building owner or by the architect as his agent, is virtually also an agent for the owner, and why in the one case the fees are paid by the owner and in the other by the builder has never been clear to me. The desirability of payment direct is also urged by the Institute of Architects, who state in their schedule of charges, 'when an architect takes out and supplies to builders quantities on which to form estimates for executing his designs he should do so with the concurrence of his client, and it is desirable that the architect should be paid by him rather than by the builder, the cost of such quantities not being included in the commission of five per cent.' It is a matter for regret that this point was not

considered by the Council of the R.I.B.A. when their conditions of contract were revised a few years ago, and the Clause (No. 13) providing for payment of the quantity surveyor's fees amended so as to bring it more in accordance with the view expressed in the schedule of professional charges from which I quote.

As the nature and extent of the work done by the quantity surveyor becomes better known his direct employment by the building owner will probably become the rule rather than the exception, and it is the hope of those who were instrumental in forming this Association that by giving greater publicity to our profession this object would be attained. It is now the general custom in London (and also to a great extent in the provinces) for public bodies, such as Borough and Urban District Councils, Boards of Guardians, Education Committees, and so on, to employ quantity surveyors direct, making the appointments under seal, and entering into a contract with the quantity surveyor under which he accepts full responsibility for the accuracy of his work, and to this course, as a general principle, no one can, I am sure, demur; there are, however, two points in connexion with it upon which some reform is, in my opinion, needed.

(1) As to the mode of making these appointments. We occasionally see advertisements in the professional papers from public bodies inviting quantity surveyors to send in tenders for taking out the quantities for works which they contemplate erecting, indeed, for works of any magnitude this is rapidly becoming the rule, and a more undesirable system it is impossible to conceive. The natural outcome of its adoption is that the lowest tenderer frequently gets appointed without any inquiry as to his qualifications and experience, a course which is alike unfair to the architect, who (although in many cases not consulted on the appointment) is surely entitled to some assurance (when he is appointed architect) that the quantity surveyor with whom he is to be associated is properly qualified and has had some experience in the preparation of the quantities for buildings of a similar character, and to the quantity surveyor, who after spending many years of his life learning his profession finds that his sole chance of obtaining work for public bodies is by underselling his neighbour, a course which is hardly likely to commend itself to a conscientious man who would regard the friendship of his brother professionals as too valuable to be jeopardised by its adoption. The fairer course for a public body to adopt, and this is occasionally done, is to fix the rate of remuneration to be paid themselves, and then invite quantity surveyors to apply for the position, stating what experience they have in similar work, and to send testimonials, and to this I am sure no one can object (if the percentage fixed is not an absurd one), as the "underselling" to which I refer is avoided, and quantity surveyors are not invited to quote for the supply of their professional services. The founder would be for the supply of a few of cast-iron pipes. In addition, this system would assure the architect's having a quantity surveyor of experience to work with, and the rate-payers would have the satisfaction of knowing that the services of the most experienced man available have been obtained on their behalf.

(2) As to the contract into which the quantity surveyor enters when appointed. Except in the case where the public bodies in question have large building works on hand, such as the London County Council, the Asylums Board, and some others, which are in the habit of frequently employing a quantity surveyor, there is, as far as I am aware, no recognised form of contract which would be applicable here, and for each separate appointment which a quantity surveyor may receive a contract has to be prepared more often than is drawn up by the clerk to the employer, who is generally utterly unacquainted with the professional details of our very special work in which the surveyor's responsibility is defined, and the document as a rule contains some stringent clauses which operate rather more favourably to the employer than to the quantity surveyor. Although I do not suppose there is a practising quantity surveyor in any position who would be unwilling to accept the full responsibility for the accuracy of his work (the fact that this Association, with its 1,000 members of the Articles has already a large and rapidly increasing members' roll, is sufficient evidence of this); still, I think you will agree that some recognised form of contract for the employment

of quantity surveyors by public bodies should be in existence.

With regard to the first point I raise—i.e., the method of appointing a quantity surveyor and the tendency on the part of public bodies to invite tenders—it is very difficult to formulate any scheme which should be adopted in order to remedy the existing evil, particularly in a short paper such as this dealing, unfortunately, in a very superficial manner with two such important subjects. Except by approaching the Local Government Board as I suggest hereafter, I personally know of no way in which we can control the action of those public bodies which are so blind to their own interests as to pay such inadequate fees for work of a highly responsible character, and I am afraid the only remedy for this method of inducing professional men to undersell each other lies with the professional men themselves.

In connexion with the erection of a public building to defray the cost of which application for sanction to a loan is made to the Local Government Board under the Public Health and other Acts, the work of the quantity surveyor is far more responsible and important now than it was in years gone by. Formerly an architect employed by, say, a Burial Board to design a cemetery chapel employed his own quantity surveyor, whose fees were included in the builder's tender and paid by him in the then usual manner, the extras and omissions were adjusted by the quantity surveyor on the completion of the building, and the accounts presented by the architect to his committee, which had in many cases no knowledge that a quantity surveyor had been employed.

In the erection of a building at the present day, say, for instance, a technical school, if, in the first place, often happens that a competition amongst architects is held, and here the quantity surveyor's services are occasionally required in making approximate estimates of the cost of erecting the building in accordance with two or three designs which the committee have selected for further consideration before making a final decision. It is often the quantity surveyor who prepares an estimate of the cost of the building upon which sanction to a loan is obtained from the Local Government Board, and this (at least, this is my own experience) is frequently made before the quantities are prepared. After the quantities are taken off and a tender is accepted for the erection of the building in question, the quantity surveyor is frequently employed to advise the committee upon the cost of any additions or alterations it may contemplate, and to prepare an approximate estimate on which to obtain the sanction of the Local Government Board to a further loan. The issue of certificates for progress payments is also becoming to be regarded as more within the province of the quantity surveyor than the architect, and on completing the measurements of the extras and omissions and effecting a settlement with the builder, it is often he and not the architect who presents the final accounts to the committee and explains how, when, and why the excess expenditure which many items involve has been incurred.

Finally (I speak more particularly of work for those public bodies whose accounts are audited by a Local Government Board and not by elected auditors) a quantity surveyor is often required to attend before the official by whom the audit is held to explain any point which may arise in the accounts of a building with which he is connected, an investigation from which, of course, no competent quantity surveyor would shrink. It must not be understood that I suggest that any of the duties which I have enumerated as being those which a quantity surveyor may be called upon to perform are those which should properly be rendered by anyone else. I have enumerated them solely in order to emphasise my point—that a quantity surveyor's duties and responsibilities have practically doubled within the past generation and his remuneration has apparently been halved.

In view of the fact that many thousands of pounds of public money are paid annually to contractors, in some cases on our certificate, in others on the certificate of the architect advised by the quantity surveyor, it is inimical to the public interest that the system of inviting tenders for professional services by their representatives should continue, and for this reason alone, I think, representation to this effect should be made to the Local Government Board, as far as I am aware, the only department which exercises any control over Municipal and

Poor Law expenditure. It appears to me desirable that power should be conferred so as to enable that department to stipulate when sanctioning a loan to defray the cost of any public building that the quantity surveyor employed should be one of whom the Board would approve, and as some members of a profession allied to ours and also practised under the comprehensive name of surveyor are appointed or licensed to act as arbitrators by the Board of Trade under the Arbitration Act, so in our case those quantity surveyors who are employed on work involving an expenditure of public money should be licensed to act in that capacity by the Local Government Board.

In order to give any effect to the suggestions I have made, it is in my opinion essential that a schedule of professional charges of quantity surveyors be issued under the sanction of the Quantity Surveyors' Association. There is, as far as I am aware, no scale of fees adapted to our practice in existence, with the exception of the rates of remuneration arranged between His Majesty's Office of Works and other Government departments and their quantity surveyors, and between the London County Council and the quantity surveyors whom they employ. These are, however, I presume, private scales of fees arranged between the respective bodies I mention and the individual quantity surveyor, and would be no evidence in support of a quantity surveyor's claim to be paid the 'customary' charges. There are, I admit, many objections made to the suggestion that a scale of charges applicable to the quantity surveyor's profession should be issued, amongst them possibly the three most serious, certainly the three most important that I have ever heard expressed, are these:—

(1) That a scale of fees published by our Association or by any body claiming to represent the interests of quantity surveyors would not be binding in law. Certainly it would not, and I do not suppose that any of us here to-night contemplate that it would. I think, however, that we might reasonably anticipate that a scale of fees issued by the Council of a representative body comprising among its members many of our leading quantity surveyors would in future become to be regarded as the 'customary' scale.

(2) That it is difficult, if not impossible, to arrange a scale of fees that would be satisfactory, inasmuch as a percentage that would be remunerative for one building would be the reverse for another, and that no two, or certainly no ten, quantity surveyors could be found to agree upon the question of adequate remuneration for preparing the quantities of buildings of the varied character which in the course of the year pass through the quantity surveyor's hands. This difficulty does not appear to have been insurmountable in the instances to which I have previously referred—viz., the various Government departments and the London County Council. Surely, if it has been possible to agree upon a scale which can apply to all the various buildings erected by these bodies, it would be equally possible for us to agree upon one which should apply to all buildings upon which we may be engaged.

(3) That if the Council of our Association were to publish a scale of fees our members would not adhere to it. This is an argument that can, I think, be dismissed as unworthy of serious consideration. Although in these days of keen competition it is certainly difficult to maintain a high standard of professional etiquette, there are, I am convinced, few, if any, of our members who would not be prepared to make some sacrifice, should the issue of a scale of fees involve any sacrifice, in order to improve the status of our profession.

I have now given the principal reasons that I have ever heard expressed against the issue of a scale of fees together with my own answers to them, and I believe that the advantages which will ultimately accrue to our profession by adopting that course far outweigh the disadvantages. The system adopted by the R.I.B.A. in fixing a uniform commission as applicable to all cases is one which, in my opinion, might well be improved on. As an alternative, I would suggest that the charges for preparing quantities be based upon a sliding scale, both having regard to the class of building upon which we should be engaged and its estimated cost—that is to say, for buildings of the domestic class costing up to, say, 5,000l. a certain rate per cent. and for a building of this class costing more the same rate up to 5,000l. and a reduced percentage on any

expenditure above. Again, for warehouses and similar buildings costing up to, say, 5,000l. a lower rate per cent. than in the case of domestic buildings and a sliding scale for any expenditure above that amount. I would suggest similar sliding scales for churches and chapels, hospitals, etc., schools, and public buildings based on their cost.

In conclusion, I should like to explain that this paper has been written more with the object of inviting discussion upon two subjects certainly, in my opinion, worthy of it, than of formulating and publishing any new and original ideas. Many of the suggestions contained herein have been made before, indeed, as regards the desirability of our adopting a uniform system of measurement, thirty-three years ago a special committee upon the employment of surveyors reported in favour of the extension to country work of the system of measurement usual in London, and, again, in one of the earlier editions of the late Mr. John Leaning's book on quantity surveying (published some five-and-twenty years ago) he states that 'there is much need that the duties, obligations, and charges of the quantity surveyor should be authoritatively formulated, and this could best be done by the Institute of Surveyors, and that the steps which that body has already taken are well calculated to effect this result.'

Although I have no wish to belittle the excellent work done and the excellent results in other directions obtained by the Surveyors' Institute (to which I am proud to belong), it is clear to me, and, I think, to us all, that quantity surveyors must not look to that body for much assistance and support in the direction indicated by Mr. Leaning, and the steps which he told us were five-and-twenty years ago being taken appear since then to have been retraced.

It must be remembered that only a very small percentage of the members of the Surveyors' Institute are quantity surveyors, and its Council would wisely and reasonably argue that to give any special support and assistance to a comparatively small section of their members would probably be adverse to the interests of the majority who practice other professions, and for this reason alone the interests of our profession are safer in the hands of a distinctive association with a council possessing power to act as they deem right in the interests of its members and elected by its members, all of whom are quantity surveyors."

Mr. A. J. Gate proposed a vote of thanks to the lecturer for his exceedingly interesting and instructive paper. In the course of his remarks, Mr. Gate said that, as to the advisability of making quantities uniform, he saw no difficulty in making them uniform in the United Kingdom, but that in the Colonies it was not possible to make quantities uniform with the quantities here. In England he believed that matters would gradually right themselves if surveyors did one thing—i.e., use the London system wherever they sent their quantities. That was his practice, and he found provincial builders not only liked that, but wished they could get quantities drawn in that way in their districts. But there were differences between the quantities of London men, and if the London system was to be generally adopted in the provinces, some of the best points of other systems would have to be included. Until that was done, those in the provinces could fairly object to adopt the London system, and if they wanted to make quantities uniform they must make their system as perfect as possible. As to taking the labours on stonework, the practice to some extent was being given up. The first object of quantities was to give a builder what he wanted in such a shape that he could price them—to give the builder all the items that he wanted to enable him to price. Nowadays, when the labours were taken, some builders asked to be excused from pricing. He should strongly object to the issue of any book or pamphlet of instructions as had been suggested. There had been one or two books published on quantities already, and people who got hold of them thought they were able to take quantities after reading them. They did not learn, but they did a lot of harm to the profession. As to omissions from the quantities, they must be errors in spite of what a learned judge said. An omission was as much an error as if one only took off half of an item. He was in favour of the quantity surveyor being appointed by the owner, and one-half of his work was done under that system. The client knew what

school purposes and is in a dilapidated condition; the drains are considerably out of level and the walls are out of plumb.

2. The buildings are old and much out of repair; there are several settlements in the walls; the bricks are soft and the stone pointing.

3. The building is in a very dilapidated condition; the walls are bad, and all the stone work has perished beyond repair; the roofs are bad, and the floors are very decayed.

4. The premises are very dilapidated, and are extremely awkward and inconvenient; there are no proper sanitary arrangements.

5. The building is dangerous in case of fire or panic.

6. The lease of the school expires in eleven years. The general arrangement of the premises is cramped and inconvenient.

7. The premises are held on lease with nineteen years to run. The boys' school is under the church four steps below street level, and is badly lighted. The girls' and infants' departments occupy a two-storey building on the south side of the church. These rooms are low, the class-room being only 9 ft. 0 in. high.

8. The buildings are so badly and firmly built that it would be better to build a new school in the adjoining street than to spend money upon repairs.

9. The school has been formed by dividing the original site of a church into two storeys; the staircase is of stone, is narrow, and the stairs are winders. The roof is inadequate, and there is no playground.

10. This is a three-storey building adjoining a coach-builder's and smith's yard; height of rooms, 10 ft. 6 in. and 11 ft. 3 in. There is only one staircase, and no emergency exit. The offices formerly been used as a stable, and the carriage driver's room is small.

11. The exit from the school is very bad, and great risk is occasioned by the position of tortoise stoves in middle of school-rooms. The drains are bad; there are no lavatories, and the premises are very dilapidated and practically require rebuilding.

12. The Board of Education will not recognise the school after last September, 1904. The department of boys' department open directly into the street; the police offices are bad. The infants' class-rooms are under the chapel, and the general structural condition is bad.

13. The school is under a church floor, and is some 14 ft. below the pavement level; the height of the school-room is only 11 ft. 4 in.; the offices are practically in a hiding, and as there is no playground it is impossible to build them elsewhere.

14. As to the drains of the non-provided schools, they are generally in a very bad condition.

"No fewer than 342, or 78 per cent., of the school drains tested have been declared unsatisfactory; 89 had under the water test, 30 under the smoke test, and 11 under both. The number of testing these drains has given one of considerable difficulty. Instructions were given for the drains of each school building to be tested, not in many cases one school is housed in two or are buildings of considerable size. In 26 separate tests than there are separate schools. In 26 separate tests the managers have refused to allow tests of any kind to be made, and it will be necessary for the Council to decide upon the action to be taken in regard to its decision of November 8, 1904. In seven cases the water test was objected to, although the smoke test, etc., was done."

The consideration of the Report was adjourned.

School for Mentally Defective Children, Peckham.—It was agreed to erect a senior boys' school and a junior mixed school for mentally defective children on the Basing-road site, Peckham; that expenditure not exceeding £10,541 be sanctioned, and that the work be carried out by the Works Committee.

Site for New Offices.—A long discussion then took place on a Report by the Establishment Committee as to the purchase of a site for new offices for the Council, at a cost of £60,000, on the south side of Westminster Bridge. The Committee recommended that a site should be acquired for the erection of a County Hall on the south side of the river, near Westminster Bridge, and having an area of just over five acres, with a western frontage of 800 ft. to the River Thames. On the basis of 150 superficial feet to each office, the building which it is proposed to erect will accommodate 2,589 officers, and 4,790 sq. ft. will be available for storage purposes. The estimated cost of acquiring the site is £60,000; the estimated cost of the buildings, foundations, etc., £1,056,000, and the estimated cost of the necessary embankment £4,000, or a total, exclusive of furniture and fixtures, of £1,700,000.

After the rejection of two hostile amendments, the Committee's proposals were carried.

Fire Brigade Stations.—On the recommendation of the Fire Brigade Committee it was agreed—

1. That expenditure not exceeding 20,345l. be authorised in connexion with the erection of the proposed fire-station.

2. That expenditure not exceeding 13,080l. be authorised in connexion with the erection of the proposed new fire-station.

3. That expenditure not exceeding 9,560l. be authorised in connexion with the erection of the proposed Herne Hill fire-station.

In each case the work is to be offered to the Works Committee, but in the event of their not being prepared to undertake the work at the amount of the architect's estimate, tenders are to be invited from selected firms.

Housing.—The Housing of the Working Classes Committee reported as follows:—

"We report that Valette-buildings, Jerusalem-square, Hackney, which consist of a five-story block of buildings, have been practically completed. The dwellings, which have been erected for re-housing some of the persons displaced through the widening of the road, Hackney, contain accommodation for 416 persons in 39 tenements of two rooms, 34 tenements of three rooms, and seven tenements of four rooms. Accommodation for the remainder of the persons displaced in connexion with the improvement has been provided in Darcy-buildings, London-fields, which were completed in June, 1904.

In continuation of previous reports on the subject of the displacement of persons of the working class in connexion with the re-development of private property, we desire to call attention to the clearance which is being effected in Barnaby-street, Collingwood-street, Somersford-street, and Tapp-street in the Metropolitan Borough of Bethnal Green. We are informed that 51 houses, comprising about 200 rooms, are already, or about to be, demolished, and that the displacement of about 370 persons of the working class is involved. New dwellings, which will contain 343 rooms, are being provided on the site, so that the accommodation on the area will be considerably increased in consequence of the rebuilding operations and the clearance of a practically insanitary area effected.

We are also informed that in the Metropolitan Borough of Southwark 57 small houses in Sterry-street, Myer's-place, Providence-place, and Fisher's-buildings have recently been demolished. The site lies on the east side of Tabard-street, and the houses contained about 144 rooms, occupied by about 280 persons of the working class. The clearance of the site was desirable from a sanitary point of view, and the property is now to be let on building lease."

Hoborn to Strand.—On the recommendation of the Improvements Committee, it was agreed:—

"That, in connexion with the provision of advertisement offices for the *Morning Post*, the offer of Mr. W. Brown to erect a cost of 702l. 10s. a temporary iron building be accepted, and that the Improvements Committee be authorised to arrange for the execution of the necessary works to adapt the portion of the ground floor of the existing *Morning Post* premises."

Working-Class Dwellings.—It was agreed to erect working-class dwellings on the Brixton-hill site, Lambeth, and to submit the working drawings, etc., to the Works Department.

Bridges.—The following recommendations of the Bridges Committee were agreed to:—

"That the plans for the proposed widening of Charing-cross railway-bridge, submitted on behalf of the South-Eastern and Chatham Railway Company by the engineer of the company under the provisions of the South-Eastern and London Chatham and Dover Railway Companies' Act, 1900, be approved, subject to the condition that if the Council so require during the execution of the work, or subsequently, the screen between the public footpath and the railway shall be backed by matchboarding of the same height as the screen, namely, 6 ft.; and that this approval shall not be, and is deemed to be, an approval under section 26 or any section other than section 22 of the above-mentioned Act.

That the plans submitted on behalf of the London, Brighton, and South Coast Railway Company, showing the widening of the bridge carrying the London, Brighton, and South Coast Railway over Prince of Wales-road, Battersea, be approved."

London Building Acts Amendment.—The Building Act Committee recommended, and it was agreed, that a copy of the memorandum by the Chairman of the Building Act Committee on the subject of the London Building Acts (Amendment) Bill, 1905, be sent to each member of the City Corporation and the metropolitan borough councils, and that copies be also sent to such of the other authorities concerned as may desire to have them.

Additions to, and Withdrawals from, the Selected Lists of Contractors.—The following recommendations of the Education Committee were agreed to last week:—

(a) That the names of the under-mentioned firms be added to the list of contractors selected to be invited to tender for the erection of new schools and additions to schools:—Galbraith Brothers, 46, Camberwell-green; W. H. Lucy & Co., 121, Bunhill-row; H. Lovatt, Limited, Darlington-street, Wolverhampton; L. Whitehead & Co., Limited, Portland Works, Portland-place North, Clapham-road; F. T. Chinnin & Co., Borens-road, Knaresborough; T. G. Sharphington, Mackell-road Works, Kimberley-road, Nunhead.

(b) That the names of the under-mentioned contractors be added to the list of contractors selected to be invited to tender for structural alterations, repairs to school buildings, etc.:—W. Eyre, 22, Great Chapel-street, Westminster; F. J. Gorman, Point-hill, Greenwich; Aldridge & Co., 73, Barnstead-road, Willesden-green; C. Johnson, 25, Dalling-road, Hammersmith; T. G. Sharphington, Mackell-road Works, Kimberley-road, Nunhead; A. Leather, Riverbank Works, Wandsworth; T. Laphams & Co., High-street, Lambeth; Grace & Marsh, 79, Tamworth-road, Croydon; Mattock & Parsons, 165, Gray's-inn-road; H. Bragg & Sons, 19, Roberts-street, Brixton-road; Crabbe & Sons, 38 and 40, Upper Tulse-hill; Kendall, 39, Bloomfield-road, Burdett-road; Bow, C. R. Price, 145, Church-street, Stoke Newington; H. Willmott, The Triangle, Hackney.

(c) That the names of the under-mentioned contractors be added to the list of contractors selected to be invited to tender for repairs to buildings, etc.:—W. Gray & Co., 76, West India-dock-road; J. Barton & Co., 122, St. John's-street, Clerkenwell; J. Sheiborne & Co., 79, Rosebury-street and High-street, Putney; W. Reason, Rosebury-avenue; W. Young, 1, Apaley-road, South Norwood; J. Martin, French, & Co., 8 and 9a, Warwick-street, Maida-hill; J. Scott, Farn 42, William-street, Woolwich; Langdon & Clark, 3, Grosvenor-road, Ilford; W. H. King, 59A, Inville-road, Surrey-square; C. Leather & Sons, 114, Merton-road, Wandsworth; G. Kirby,

Queensland Works, Holloway; T. Wilson, 6, Old Gravel-lane; J. Knight & Sons, 24, Gertrude-street, King's-road, Chelsea; P. Chidley & Co., Limited, 56, Lydford-road, Paddington.

(d) That the name of Mr. W. Harrow (works adjoining South Bermondsey station) be added to the list of contractors selected to be invited to tender for the erection of brick structures and partitions.

(e) That the name of Messrs. C. Leather & Sons, of No. 14, Merton-road, Wandsworth, be added to the list of contractors selected to be invited to tender for the erection of iron buildings and brick structures.

(f) That the names of the under-mentioned firms be added to the list of contractors selected to be invited to tender for heating works:—W. Richardson & Co., Darlington; John Jeffreys, 11, Old Queen-street, West; minister; Bolton, Fane, & Co., 298 and 300, Goswell-road; Russell & Co., 42, Berwick-street, Oxford-street; J. Jones & Sons, 66 and 67, Shoe-lane; A. Ritchie & Co., 12 and 13, Upper Thames-street.

(g) That the names of the under-mentioned firms be added to the list of contractors selected to be invited to tender for sanitary and drainage works:—E. Tabor, Cam-road, Cambridge; Davey & Roberts, 222A, Vauxhall-bridge-road; R. Harding & Son, 75, Arden-road, Brixton; Grubb & Son, 38 and 40, Upper Tulse-hill.

(h) That the names of the under-mentioned contractors be added to the list of contractors selected to be invited to tender for cleaning and painting schools:—J. J. Richards, 9, Shannon-grove, Brixton; H. Harding & Son, 75, Arden-road, Brixton; J. Knight & Sons, 24, Gertrude-street, King's-road, Chelsea.

(i) That the names of the under-mentioned contractors be added to the list of contractors selected to be invited to tender for providing and fixing iron staircases:—Geo. Mills & Co., Radcliffe, near Manchester; Pearson & Co., 17 and 19, St. Dunstons-hill, E.C.; A. Ritchie & Co., 12 and 13, Upper Thames-street.

(k) That the name of Messrs. W. Sugg & Co., Limited, of Vincent Works, Regency-street, Westminster, be added to the list of contractors selected to be invited to tender for supplying and fixing gas mains and fittings.

(l) That the names of the under-mentioned firms be removed from the lists of contractors selected to tender for works in connexion with L.C.C. schools:—E. W. Richbell, R. Redfern, J. Bower, H. C. Gray & Son, G. Bell, J. Sloper & Co., J. Williams & Sons (Cardiff), Limited; Mrs. H. Evans, Evans Bros. (name removed from cleaning and painting list only); H. Rumlum Brown.

Buildings—Repairs to—Printed Schedule of prices.—The following recommendation of the same Committee was agreed to last week:—

That the offer of Mr. C. J. Jerrard, the contractor for executing repairs to schools in groups 4 and 6 (Greenwich district), to undertake, temporarily, the work of executing repairs to schools in groups 1, 2, 3, and 5 (Greenwich district), at an addition of 5 per cent. to his present contract schedule of prices for (a) measured work, (b) sanitary work, and (c) other work, pending the acceptance of fresh tenders for the execution of the work in the whole of the county, be accepted.

The Council adjourned shortly before nine o'clock for the Easter holidays.

ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The annual meeting of this Society was held in their room, Leopold-street, on the 13th inst., Mr. T. Winder presiding. Mr. C. B. Flockton was elected a Fellow of the Society. The treasurer's statement of accounts and the auditors' report, which showed a satisfactory increase of the balance in hand to last year, was adopted, with thanks to the auditors. The annual report of the Council, which showed a membership of 120, being the highest number in the Society's record, was read and adopted. It was announced that Mr. W. C. Fenton, in consequence of increasing public duties, wished to be relieved from the office of Secretary, which he had held for eight years, and a special vote of thanks was accorded him for his excellent work. A ballot was taken, and the following gentlemen were elected officers:—President, E. Holmes; Vice-President, W. C. Fenton; Treasurer, R. Fowler; Secretary, J. B. Wigull; Council:—Past-Presidents, Messrs. E. M. Gibbs, C. Hadfield, R. W. Fowler, Jos. Smith, P. C. Hadfield, T. Winder, Fellows:—Messrs. H. Coverdale, W. J. Hale, J. B. Mitchell-Withers, H. L. Paterson, A. E. Turnell, and C. B. Flockton. Associates:—C. M. Hadfield, C. F. Innocent, and H. J. Potter. A prize of 5l. 5s. for the best set of measured drawings was awarded to Mr. J. M. Jenkinson. The Society's prize for the best work in the designing class was awarded as follows:—1l. 1s. each to Mr. G. R. Bower and Mr. J. R. Traclevor, and 10s. 6d. to Mr. D. H. Loukes. A hearty vote of thanks was accorded to the President and Council for their work during the year.

YORK ARCHITECTURAL SOCIETY.—In the York Museum Theatre, on the 18th inst., a meeting was held under the auspices of the York Architectural Society, when a paper was read entitled "Some Notes on Classic Art," by Mr. Wilfrid J. Milburn. The chair was occupied by Mr. G. Benson. Assyria was the first and greatest nation of antiquity with whose early efforts of art they had to deal. The building materials in Assyria were a great factor in determining the art of

this nation. M. Botta and Sir Austin H. Layard were the most notable discoverers of the ruins of the cities, and no fable of hidden treasures or wealth had half the romance that the story of the indefatigable labour of these men had. When digging, Layard unearthed notable "finds," but the greatest was the discovery of the human-headed bulls or lions. Probably of all the Assyrian masterpieces, the most famous was that of the wounded lioness, the expression of face being very fine. Of Egyptian art great finds had been heard of recently, and passing on to Greek art, which came to full perfection under Phidias, it might be said that the most famous representation of the goddess Athene was the large statue made by Phidias. The Olympic games and their celebration were a great festival in Greece, and the sculptors were able to see the finest models. The speaker showed many slides illustrating his subject, and at the conclusion of the lecture a vote of thanks to Mr. Milburn, proposed by Mr. A. Pollard, and seconded by Mr. Parker, was accorded by acclamation.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the evening meeting, on the 12th inst., Mr. C. H. Compton, V.P., in the chair, Mr. Emanuel Green exhibited a fine example of a moneyer's weight, of bronze, Portuguese, of about A.D. 1600, and equivalent to the weight of 3*l.* 12*s.* of our coinage. Dr. W. de Grey Birch exhibited an Egyptian vase of terra-cotta, supposed to be of about 5,000 years B.C., also a very elegant vase from Cyprus, of about 1,500 years B.C.; both are of the character known as labry vessels. Mr. C. Dack, of Peterborough, read a paper on "Folk and Weatherlore of Peterborough and the District," in continuation of one upon the survival of old customs in Peterborough read by him some few years ago. Peterborough being situated at a point of junction of the four counties of Northamptonshire, Huntingdonshire, Cambridgeshire, and Lincolnshire, forms, as it were, a centre for so many sayings that it becomes difficult to make a selection; Mr. Dack, therefore, confined his account to those proverbs he had himself heard quoted in Peterborough

and within a radius of twelve miles round, and the folk and weatherlore he had learned from old and young by word of mouth. In the local proverbs Peterborough is almost always associated with pride, from pre-reformation days even to the XXth century.

COMPETITIONS.

HAMMERSMITH BATHS AND WASH-HOUSES.—In a report circulated on Tuesday the Baths and Wash-houses Committee of Hammersmith Borough Council state that designs for the erection of baths and wash-houses have been received from the six competing architects, and are now under consideration.

SCHOOLS, PRESTON.—The following is the result of the recent competition (open to Lancashire architects) for new Council Schools in Roebuck-street, Preston:—(1) Mr. Herbert Howarth, Morecambe (50*l.* premium); (2) Mr. A. Brooklehurst, 30, Brown-street, Manchester (30*l.* premium); (3) Mr. F. Quentery Farmer, 38, Dale-street, Liverpool (20*l.* premium).

Illustrations.

MEMORIAL HALL, MASSACHUSETTS STATE HOUSE, BOSTON.

HIS illustration shows the interior of the Memorial Hall in the Massachusetts State House, at Boston, U.S.A.

Mr. Charles Brigham is the architect. The design, as will be seen, is entirely composed of long-accepted and orthodox classic details, but they are put together and used in a refined and suitable manner, and produce an apartment which should have a dignified and stately effect.

The illustration is reproduced from one which appeared in the *American Architect*. We have arranged with the editor of that publication that we should be at liberty now and again to reproduce an illustration of an important new building in the United States from his pages, by way of more easily giving our readers an occasional example of recent American archi-

tecture; it being exceedingly difficult to induce American architects to send drawings or photographs of their works across the sea. Mr. Flagg's kindness in sending his Naval Academy illustrations the other day was quite an exceptional case.

THE CHAPEL, KING EDWARD VII SANATORIUM.

This building is being erected through the munificence of Sir John Brickwood, and is designed on a unique plan as an open air chapel. It is V-shaped, with a nave for men and another for women, and the chancel centrally situated at the apex of the V. The whole of the one side is entirely open to the south, and protected on the north, west, and east with an open cloister on the south and open side as protection from the weather.

There is an outside pulpit, which can be used in very fine weather.

The heating is a novelty in this country; the heating pipes being under the floor, and the floor itself being warmed and giving off the heat. The outside of the buildings is of red and grey bricks and Bath stone, with local red tile roofs, the woodwork being of oiled teak.

Internally, the walls are lined with stone, and the ceilings plastered, and floors of stone and marble.

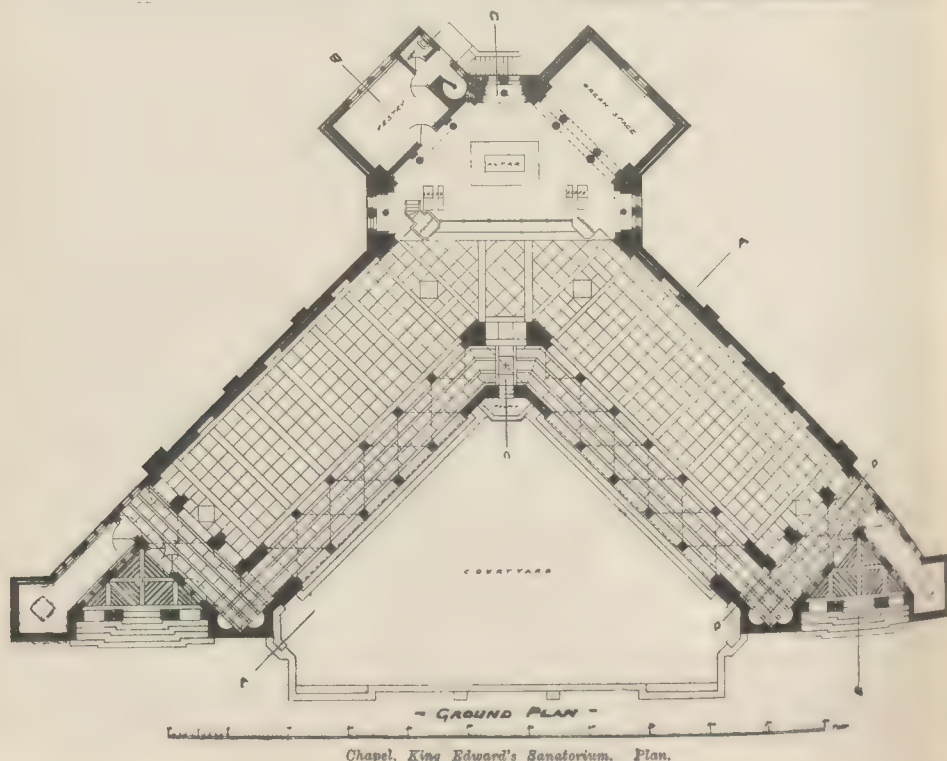
The builders are Messrs. Longley, of Crawley, who are carrying out the whole of the other work; and the architect is Mr. H. Percy Adams, F.R.I.B.A. (not "Percy H. Adams," as accidentally given on the title of the plate).

BUILDINGS IN DUNEDIN, NEW ZEALAND.

THESE illustrations are reproduced from small photographs, to accompany the article "Notes in New Zealand," which appears in the present issue.

The following are the titles to the subjects on the plate:—

- A.—Town Hall, Dunedin.
- B.—St. Joseph's Roman Catholic Church and Convent.
- C.—Corner of High and Prince's Streets looking up High-street; the Gargill Monument in the foreground.
- D.—The High-street in 1883.
- E.—The First Church, Dunedin.
- F.—The Law Courts.
- G.—The Hospital.



APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Erection of Buildings on Low-lying Land.

Westwick.—That Mr. Cook be informed that the Council will take no action with regard to the non-compliance with the condition as to the time within which the buildings were to be erected, contained in the licence, granted to Mr. T. H. Driver, for the erection of 106 buildings at Marmadon-road, and eight buildings at Church-moorway, Plumstead, provided that such buildings be erected within fifteen months from March 25, 1905.—*Agreed.*

Erection of Shelters over the Proposed new Entrances to the Royal Institute of Painters in Water-colours and Prince's Restaurant.

Strand.—Two iron and glass shelters to the Royal Institute of Painters in Water-colours and Prince's Restaurant on the south side of Piccadilly (Mr. E. R. Robson for the Royal Institute of Painters in Water-colours).—*Consent.*

Lines of Frontage and Projections.

Yerwood.—Ten houses on the northern side of Auckland-hill, Norwood, westward of No. 32 (Mr. J. W. Stevens for the exors of Mr. F. R. App).—*Consent.*

Hampstead.—An iron and glass porch at No. 24 Lyndhurst-road, Hampstead (Messrs. C. Saunders & Son for Mr. A. H. Curnick).—*Consent.*

Peckham.—An additional story to a one-story addition at the rear of No. 62, Queen's-road, Peckham, to abut upon Burchell-road (Mr. E. J. Stevens for Mr. R. J. Wade).—*Consent.*

Marylebone, West.—Bay-windows and balconies at Loudoun-mansions, Marlborough-road, St. John's Wood (Mr. P. Hoffmann for Mr. W. H. Dunn).—*Consent.*

Strand.—Two projecting signs at Nos. 1 and 3, Cockspur-street, and Nos. 18 and 19, Pall Mall East (Mr. H. Tanner, jun., for the International Navigation Company).—*Consent.*

Wandsworth.—Sham half-timber work and a projecting porch to a detached house on the east side of Larpent-street, Putney (Mr. C. F. Payne for Messrs. J. & S. Sampson).—*Consent.*

Chelsea.—A projecting illuminated sign to the painter on the east side of No. 13, Brompstone-road, Chelsea (Mr. W. Graves for Messrs. Evans, Ltd.).—*Consent.*

Lewisham.—The retention of a greenhouse at the projecting one-story shop at No. 71 Brockley-road, Lewisham (Messrs. C. Hayward & Co.).—*Consent.*

Marylebone, West.—A one-story addition to No. 16 St. John's Wood-road, St. Marylebone, to abut upon Cunningham-place (Mr. F. Cooper for Dr. W. Davis).—*Refused.*

Yerwood.—Houses on the south side of Fernside-road, east side of Poplar-walk, and north side of Haredean-street, Herra Hill (Messrs. R. Miles & Son for Mr. R. A. Sanders).—*Refused.*

Wandsworth.—Houses on the north side of Hildewell-road, Putney, to abut upon Camperdown-street and Larpent-street (Mr. J. Coleman).—*Refused.*

Width of Way.

Hampstead.—A boundary wall to the playground of the New End school, Hampstead, at less than the prescribed distance from the centre of the roadways of Murray-terrace and New End (Mr. T. J. Bailey for the Education Committee of the Council).—*Consent.*

Strand.—A building at No. 114, Wardour-street, to abut upon Ship-yard (Mr. H. Tanner, jun.).—*Refused.*

Width of Way and Lines of Frontage.

Hammersmith.—The retention of a wooden shed at the rear of No. 103, Askew-road, Hammersmith, with the external walls at less than the prescribed distance from the centre of the roadway of Lander-road (Mr. W. C. Smith).—*Consent.*

Hampstead.—Buildings upon the site of No. 105, Heath-street, Hampstead (Mr. W. Erby for Miss G. Eldon).—*Consent.*

Exminster.—Two houses on the south side of Viceroi-road, South Lambeth, with frontage boundaries at less than the prescribed distance from the centre of the roadway of the street (Mr. G. G. Rogers for Mr. H. J. Coleman).—*Consent.*

Line of Frontage and Construction.

Battersea.—A wood and iron building on the forecourt of No. 77, Battersea Park-road, Battersea (Messrs. J. A. J. Woodward & Sons for Battersea Park Brewery Company).—*Refused.*

Space at Rear and Projections.

St. Pancras, North.—A building adjoining No. 1, Lady Margaret-road, St. Pancras, with an open space at the rear (Mr. J. F. Parker for Mr. H. Freeman).—*Consent.*

Space at Rear.

Battersea.—That the Council do consent to Nos. 11, 13, and 15, High-street, Battersea, having open spaces about such buildings (Mr. H. Griffin for Messrs. G. J. Chadwin, W. D. Nichols and Miss C. Bennett).—*Consent.*

Lewisham.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building on the west side of Gillian-street, Ladywell, with an irregular open space at the rear (Messrs. Norfolk & Prior for Mr. T. C. Liffon).—*Consent.*

Wandsworth.—A deviation from the plans approved for the erection of a house on the west side of Nepean-street, southward of Umbria-street, Wandsworth, so far as relates to the erection of such house with a one-story studio (Mr. A. J. Hardwick for Mr. T. D. McMeekin).—*Consent.*

Formation of Streets, etc.

Westminster.—That an order be issued to Messrs. R. B. Grantham & Son sanctioning the formation or laying out of a new street for carriage traffic to lead from Francis-street to Cobour-row, Westminster (for the Ecclesiastical Commissioners).—*Consent.*

Kensington, South.—That an order be issued to Mr. D. Brown sanctioning the formation or laying out of a new street to lead out of the east side of Church-street, Kensington, and in connexion therewith the erection of buildings.—*Consent.*

Lewisham.—A deviation from the plans sanctioned for the formation of two new streets for carriage traffic in continuation of Sandrock-road and Overcliff-road, Lewisham, respectively, and of a street for foot traffic only to connect such two new streets, so far as relates to trees being substituted for the posts required to be erected across the street for foot traffic only, and an alteration in the level of such street (Mr. N. McDougall).—*Consent.*

Whitechapel.—Means of ventilating the new streets for foot traffic only, upon a site on the south side of Fashion-street, Commercial-street, Whitechapel, and the erection of Bostwick gates, 10 ft. in height, at the entrances to the new streets from Brick-lane, Fashion-street, and Flower and Dean-street (Mr. A. Davis).—*Consent.*

Buildings for the Supply of Electricity.

Kensington, South.—The retention of coal-conveying machinery on the roof of the Company's generating station, Richmond-road, Kensington (Messrs. Babcock & Wilcox, Ltd., for the Brompton and Kensington Electricity Supply Company).—*Consent.*

Bow and Bromley.—A steel chimney at the generating station, Glaucon-street, Poplar (Mr. J. H. Bowden for the Council of the Metropolitan Borough of Poplar).—*Consent.*

Working-class Dwellings.

Hackney, South.—Dwelling-houses to be inhabited by persons of the working class, and proposed to be erected upon a site abutting upon Homerton-row, Urawick-road, and High-street, Homerton (Messrs. Gordon & Gunton for Hackney Borough Council).—*Consent.*

Means of Escape at Top of High Buildings and Projections.

Kensington, South.—Means of escape in case of fire proposed to be provided on the sixth (top) story of two of the proposed buildings upon the site of "York House" and "Maitland House," Church-street, Kensington (the upper surface of the floor of which story is above 60 ft. from the street level) for the persons dwelling or employed therein (Mr. D. Brown).—*Consent.*

*The recommendations marked * are contrary to the views of the local authority.*

BATHS, EAST LEEDS.—The Lord Mayor of Leeds (Mr. Robert Armitage) has just opened the new baths which the Corporation have erected in York-road. The building, which has been erected for the joint purposes of a branch library (already opened) and public baths, occupies a position with a frontage of 110 ft. to York-road. The accommodation consists of slipper baths, Russian bath, swimming bath, laundry, boiler-house, etc. There are twenty slipper baths, sixteen for males and four for females, and the swimming bath has a water area of 75 ft. by 30 ft., the maximum depth being 6 ft., and the minimum 5 ft. The total cost of buildings, machinery, fittings, and general equipment of the library and baths will be about 80,000. Mr. H. A. Chapman, of Leeds, is the architect.

Books.

A History of Architecture on the Comparative Method. By PROFESSOR BANISTER FLETCHER and BANISTER F. FLETCHER. Fifth edition, revised and enlarged. London: B. T. Batsford. 1905.

In reviewing the previous edition of this publication we welcomed certain improvements and corrections. The present, or fifth edition, contains further developments, all of which have materially improved the value and widened the scope of the book. Mr. B. F. Fletcher, the original joint author, points out in the current preface that 200 pages and some 700 illustrations are added, whilst he has re-written much of its matter. All this, we observe, is accomplished without adding to the bulk of the volume; indeed, by changing the quality of the paper the actual size is reduced.

In view of the constant necessity for modification due to research and discovery, it is of paramount importance that any such book as this, which is forced to condense its contents, should be accurate in its references and varied to comply with the most recent disclosures and opinions. The author appears to be alive to this fact, and is to be congratulated upon producing an amended and extended edition in so brief an interval. The chief development lies in the treatment of the classic periods of architecture. Amongst many valuable additions are restorations of the Acropolis and of the Forum at Rome. A diagram termed "The Tree of Architecture" now prefaces the work, and is a device which should tend to mould the popular idea of what architecture really is.

It would be here impossible to enter upon a detailed criticism, but in a broad survey we should say that the treatment of the numerous phases of the art of building is somewhat disproportioned, that the work is written from the English standpoint, and that the influence of materials as a factor in all design is not sufficiently emphasised. So much is attempted, and much of it so well dealt with, that the average reader is disappointed in, for instance, observing that American architecture of the Renaissance has no illustration and but scant reference; that Scottish work is dismissed in two pages; that the Gothic building extending to Norway is not noticed; and that the architecture of Russia, a vast territory prominent in current affairs, is practically unheeded. We could wish also to see the pages of line diagrams less crowded, and what is attempted more completely dealt with. As an instance, St. James's Church, Piccadilly, has its tower cut off and no idea of its termination given, in an endeavour to accomplish everything on one sheet. Again, little pieces of design are often given without a key reference to show the actual relation to the whole.

We do not agree with the author in substituting the terms "early" and "late Victorian style" for the expression "The Nineteenth Century" of the fourth edition in concluding remarks upon English architecture. In this respect, also, several of the examples are open to question; we should not consider the new Westminster Cathedral as belonging to the Gothic school. Printers' errors are still present, and the general index is in need of revision.

In so comprehensive a work, however, defects are sure to arise which a constant and thorough re-editing will alone correct, but the "History of Architecture on the Comparative Method" is, in its present form, a work which deserves its success.

The XVIIIth Century Architecture of Bath. By MOWBRAY A. GREEN, A.R.I.B.A. Bath: G. Gregory. 1904.

MR. GREEN has produced a monumental volume worthy of its interesting subject. The book is rather one for a general library than an architectural one, as it deals in part with the social as well as with the architectural history of XVIIIth century Bath; but the author has given a good deal of pains to tracing out the architectural history of the most important streets and buildings, and the part which various architects had in designing them. Prior Park of course occupies a considerable space in the book; but the street houses in Bath are not neglected.

The development of Bath during the

period when the place was most fashionable is a testimony to the dignity of effect which can be given to a city by the employment of the traditional forms of classic architecture, even in a somewhat tame and prim version. Taken separately, the fronts of the houses would seem dull and commonplace enough; the effect lies in the bold massing of streets and terraces into one comprehensive design, to which classic columnar architecture lends itself so well. The Circus and Camden-crescent are effective by their breadth and continuity of treatment, to which all individuality in the design of any one house is sacrificed; one could only know one's house by the number, for all are exactly alike, a long façade divided up into tenements. Something is lost in domestic interest by such a treatment, but it must be admitted that if the taste of the private house-owner is neglected, public architecture is considered; with the result that in spite of its small size, Bath is the most stately city in England, the only one which (to compare small things with great) may be said to vie with Paris in dignified appearance. The best part of Milsom-street, too, with its segmental columned bay, answered by square columned and pedimented projections at an equal distance on each side, is a most effective piece of street architecture of the kind.

The author has aimed at showing the manner in which Bath was transformed, chiefly by the Woods, father and son, of whom the elder was a speculating builder as much as an architect, and financed his architectural improvements as well as making the designs for them. Among the interesting items in the volume is the reproduction of the working-drawing plans for one of Wood's country houses, that of Titan Barrow, Kingsdown, designed by Wood in 1748 for Mr. Southwell Pigott. These plans seem to combine plan and specification in one document. The walls are drawn in outline only, not filled in with shading, and over the floor space of each are the very neatly-written directions or memoranda as to the way in which it was to be finished; this was how things might be arranged before the days of "quantities." This is the description on the floor marked "drawing room":

"The Floor of this room to be boarded with clean Norway oak doubled, an architrave chimney-piece in Freestone to be carved, a white and veined marble slab, the room to go up to the Roof and to be covered a third or 1 of its altitude as shall be directed, and a compartment in the ceiling with an enrich'd bed moulding within. A Corinthian entablature round the room fully enriched in free stone, double architraves round the doors and blank door. Tabernacles round the windows with scrolls, festoons, and rolls (?). Wainscot Sur Base high, and the walls lued above to the Entablature with silk deal. The timbers of the floor to be 6 inches deep, and celled or otherwise closed to prevent air damp from penetrating into the room."

All dimensions are figured, though the scale also is carefully kept. The doors seem small, varying from 3 ft. to 2 ft. 6 in. This is a 24-ft. by 18-ft. room, so that of course the "6 in. timbers" were on sleeper walls, though no mention is made of this; but it is odd that in the adjoining study, 18 ft. by 16 ft. 6 in., we find special mention of a girder 12 in. by 10 in. and joists 10 in. by 2½ in. Presumably the study was celled under and the drawing-room was not. Apparently sections were not drawn; in the writing on the hall we find the note that "this room and the study and the dressing-room are to be ten feet high in the clear"; "the front door to be close or sashed as shall be directed. The same to be hung with good hinges and to have a Lock and Nocker to it."

In the upper plan the description of the drawing-room (which was "to go up to the roof") is continued—"The ribs on the cove of the room to be of old Beal Board of 2 inches thick, or of Sweeds deal." The whole document forms a curious record of house-building a hundred and fifty years ago. The plan of a house in Queen-square is another interesting record, with a bedroom opening out of the drawing-room on the first floor, with no other access (originally), and another bedroom opening out of that. In more recent times, too, single passages have been opened to get to the back rooms, by cutting a bit out of the corner of the staircase.

If the exterior architecture of the Bath houses was monotonous in its dignity, however, there was variety enough internally, in ceilings, fireplaces, and decorations generally; all in one style, but varied in detail, and all in excellent taste, characterised by refinement without display or exaggeration. Illustrations of many of these are given. There was perhaps no period when the interior decoration of dwelling-

houses was more refined in character, though it was no doubt deficient in colour.

The book is got up and printed in a sumptuous style, and is a credit both to author and publisher.

Laxton's Builders' Price-Book for 1905. Originally compiled by WILLIAM LAXTON. Eighty-eighth edition. London: Kelly's Directories, Ltd., 182, 183, and 184, High Holborn, W.C.

WHAT is in a name? One is led to exclaim when taking up the eighty-eighth edition of this work, the forerunner of the modern price-book; we, however, do not think there is much in common between this work and that originally compiled. A short time since we had the opportunity of examining the edition of 1861—just halfway back to the first edition—and could not fail to be impressed with the difference, in point of size and usefulness, between that volume and those of the past few years. The difference in the prices too was a revelation, notwithstanding the fact that, for obvious reasons, Laxton was in its earlier days the favourite book of reference for builders when any question arose. The prices in the edition before us have been generally brought up to date, but we are afraid that if the editor does not alter the prices of his brickwork his work will not find the favour with the architect that it does with the builder. True, a note is made in the heading that bricks are estimated at 46s. and 40s. per 1,000 for stocks and grizzles respectively. These prices have done duty for some time now, and we think they could be safely reduced. The harvest of the brickmakers of a few years ago is now a thing of the past.

It is obviously impossible to look at every one of the 72,000 prices, but we notice an awkward slip on page 125. On page 124 in the general notes on Westmorland slating the price is given at 70s. per square (a fair one), whereas in the prices proper on page 125 it is given at 55s., which is very misleading.

We are glad to see that the chapter "On the Adaptation of a Price-book to meet varying Rates of Wages" has been revised to meet the present rates, after having been for some years calculated upon an erroneous basis.

Rather more than a third of the total work is made up of various items of information re Building Acts and various regulations, legal questions and contract documents, as well as numerous tables, without which no price-book is considered complete nowadays. While not strictly appertaining to prices, they add to the usefulness of the volume as a work of reference.

Taking the work through, we may say that, with a few exceptions, it can be generally relied upon as far as is possible with a work of this nature.

The Scientific Design of Masonry Arches: with Numerous Examples. By THOMAS ALEXANDER, M.A.I., Professor of Engineering in the University of Dublin, and ARTHUR WATSON TROMSON, D.Sc., Professor of Engineering in the College of Science, Poona. Illustrated by Twenty-five Diagrams. Dublin University Press.

This is a folio pamphlet which has been incorporated in the second edition of a treatise upon "Elementary Applied Mechanics" by the same authors. The main object in view is the design of masonry railway bridges and viaducts with arches of long span and small rise. In order to carry successfully swiftly-moving traffic of the kind it is desirable that the middle portion of the arch-ring should be characterised by a considerable amount of elasticity, while the haunches are heavily backed to afford the requisite resistance to the horizontal thrust of the arch. The beautiful manner in which the authors have worked out the various problems connected with the designs of such bridges is truly worthy of the highest encomium, and in our opinion the method of treatment is the best hitherto published. In Rankine's "Civil Engineering," conjugate load areas are discussed in the characteristic style of that master by the aid of mathematical expressions which are difficult of application to the equilibrium of arches. The authors here substitute a semi-graphical mode of constructing the load areas, dispensing, to a large extent, with mathematics and extending the method to the complete design of segmental and elliptical arches, with their spandrels, abutments, and piers. The family of catenary curves is considered as divided into two groups, the more important of which has been designated by the authors "two-nosed" catenaries.

Consideration of these two varieties helps to demonstrate the manner in which masonry arches break up when the abutments are gradually removed. The most practical portion of the work is the one containing tables which furnish all the information necessary for the direct design of segmental masonry arches.

In this notice we cannot attempt to discuss in detail the methods followed by the authors. Their treatment is thoughtful and admirably lucid, the illustrations are of more than ordinary excellence, and the book is one which we can conscientiously recommend to all who desire to grasp the essential features of arch design as applied to structures of the class to which reference is made.

Practical Masonry: a Guide to the Art of Stone-cutting. By WILLIAM R. PURCHASE, Building Inspector to the Borough of Hove. Fifth edition, enlarged. London: Crosby Lockwood & Son, 1904.

The fifth edition of a book does not as a rule call for an extended notice, and the volume before us is no exception to the rule. It is an able and practical treatise on the art of stone-cutting which can be heartily recommended to students. The author writes clearly and tersely, and does not shrink any of the difficult problems occurring in ordinary practice, such as geometrical stairs, vaulting, domes, skew arches, and circle-on-circle work. There are fifty-two full-page plates, containing about 400 diagrams. In this edition new sections have been added on "Masonry Estimating and Quantity Surveying" and "Building Stones, Marbles, and Granites." These sections are decidedly useful. The author has taken pains to ascertain the current prices and other particulars of the stones mentioned, but the list is necessarily incomplete. It is, however, a matter of surprise that no mention is made of a marble now so well known as the Verde Antico, or of some other Greek marble. The Glossary of Terms is also incomplete; thus, we find "architrave," "cornice," and "entablature," but no separate entry for "frieze," "balustrade," "we look in vain for "balustrade," "foot-stone," "knee-stone," "dado," "die," "stringcourse," "trefoil," "pendentive," "stringcourse," "trefoil," and a number of other terms used in connection with masonry. The glossary is useful as a kind of index, but does not by any means include references to all the matter in the text. These are comparatively trifling defects, and do not detract seriously from the merit of the book.

The Year's Art: 1905. Compiled by A. C. R. CARTER. London: Hutchinson & Co. 1905.

THIS is the twenty-sixth annual issue of this useful publication. It contains the usual full world information as to the doings in the art-world during the past year, with a special report on the investigation in regard to the Chantry bequest, and portraits of the members of the Chantry Committee of Inquiry. The editor contributes a short review of "The Past Year."

Portland Cement for Users. By the late HENRY FAJJA, M.Inst.C.E., Hon. A.R.I.B.A. Fifth Edition, Revised and Enlarged by D. B. BUTLER, A.M.Inst.C.E., F.C.S., F.R.S.E., M.Soc.C.I. London: Crosby Lockwood & Son, 1904.

ORIGINALLY published some twenty-three years ago, this handy little book has been successively revised and enlarged by the addition of supplementary and extra supplementary chapters and appendices, first by Mr. Fajja, and then by Mr. Butler, but still without making the volume at all bulky. The present edition, as we should say, the editor—has been revised after the arrangement of the work, or to touch the writings of the original author more than necessary. Although the revising is necessary, we cannot help thinking that some of the motives of the added chapters consist of matter that belongs properly to other chapters in the book, and as the appendices now cover nearly as many pages as the main body of the work, it would be better if the whole subject matter had been entirely rearranged. Apart from this suggestion, no fault can possibly be found. Mr. Butler has corrected a few passages where the old edition has been corrected, required amendment or of modern knowledge, required revision or modification, he has added a revised form of specification, a chapter on "Adulteration," and a modern series of analyses, thus bringing the work thoroughly up to date, and preserving its former character as an admirable guide for users of Portland cement.

BOOKS RECEIVED.

REINFORCED CONCRETE CONSTRUCTION.—By A. W. Buel and C. S. Hill. (Archibald Constable & Co., 21s.)

A HANDBOOK FOR SUPERINTENDENTS OF CONSTRUCTION.—By H. G. Richey. (Chapman & Hall.)

STAINED GLASSWORK (Artistic Crafts Series of Handbooks). By C. H. Whall. (John Hogg.)

STRUCTURAL DESIGNERS' HANDBOOK. By W. Fry Scott. (Engineering News Publishing Co., New York.)

MODERN HOMESTEADS: A PRACTICAL AND ILLUSTRATED TREATISE. By Samuel Taylor, F.S.I. (The Land Agents' Record Office.)

Correspondence.

ARCHITECTURAL EDUCATION.

SIR,—As I find no further reference to this subject in the *Builder* this morning, I shall now briefly amplify certain statements in my article on the subject which you were good enough to publish, and which your correspondent, "H. M.," appears to have been unable to understand. Unfortunately, he confines his criticism to points of comparatively little importance—matters capable of easy adjustment when the Educational Board goes more into detail after they have elicited some general expression of opinion on the part of provincial societies and individuals—which I assume was their object in making their tentative scheme public. My knowledge of that scheme was derived from Mr. Blomfield's remarks and the discussion following, as reported in the *Journal* of the Royal Institute of British Architects of February 25 last, and if your correspondent will be so good as to refresh his memory by referring again to the recommendations of the Board, as explained by Mr. Blomfield, he will, I think, readily grasp my meaning when I speak of serving the architect only half-time during the third year. The proposal, as explained, was this (see p. 243 of the *Journal*):—

"These five subjects would be studied in the schools during the two years' preliminary or introductory course. The advanced course, which would follow on (that is to say, during the third year), would include the further study of materials and construction, design, history, and architectural drawing, with some rudimentary instruction in modelling."

The recommendation is that the first two years shall be devoted to study of a preliminary character, and that the third year he should go into an architect's office and that the more advanced scholastic studies should be continued. Does "H. M." mean to say that the student is to work daily full time in an architect's office and then to get this advanced instruction in any way he can manage to do it, and in the scraps of time that are left at his disposal? Now, if, as I contend, an essential condition in any course should be that the obligatory hours of work for any young man between sixteen and twenty years of age should not exceed nine hours daily, I should like "H. M." to explain how this is to be adjusted in any better way than that which I have suggested. Nor is the proposal so absurd as "H. M." seems to think. It is no use pleading that if architects are so deeply interested in the education of architectural students as they profess to be they might stretch a point and occasionally give one a stool in their office for four and a half hours daily, even if they were not actually in need of his services. What is more to the purpose is to show that in the suggested arrangement they would have much the best of the bargain. The would-be half-timer is not an ignorant lad interfering with the work of the office in any way. He has learnt everything essential to qualify him as a draughtsman—or, if not, he had better give up the idea of ever being one. He is in the position of an improver, and he comes to an architect with certificates proving his competency, and says, "If you will allow me a seat in your office four and a half hours daily this year I will do my best to assist you, and I shall serve you full time next year without asking for any remuneration." Of course, an architect who saw no chance of having employment for an odd hour of this kind should decline to have him, and no one should take more than one such improver at a time. That, of course, is only my opinion; and I think, further, that if an architect in such circumstances—as he is encouraged to do by the Educational Board—exact a premium for what

is nominally a year and a half's apprenticeship, it is simply degrading the premium to the level of a bribe for securing a situation.

Of course, there are other ways of dividing the time to suit the teaching facilities in different localities, but the time being strictly limited it must be judiciously allocated with due regard to the value of what is to be gained by its expenditure. For example, if we are of opinion that the knowledge which may be obtained by a student during his third year by attending classes in school or college is likely to be of more value to him than that which he could obtain in an architect's office, the time should not be equally divided between the two modes of tuition. The scholastic should decidedly have the preference and have the largest share of the available time assigned to it.

I can only ask you to allow me briefly to refer to one other matter regarding which "H. M." seems mystified, namely, my stipulation that during the first year of his preliminary course the student should have at least a month of holidays. In Mr. Blomfield's address nothing was said about the student's occupation during the first two summers, and as I had suggested filling up the blank by a few months' instruction in a merchant's or accountant's office, I took care to prescribe that the student should have a clear month of holidays. That is the simple explanation. But I now understand from "H. M.'s" remarks that the proposal is that instruction should go on during the summer, and that the terms and holidays should correspond with those of our public schools. I entirely agree with your correspondent in thinking that to be the most satisfactory course, but is it practicable? It may be in London, but not generally over the country. Here in Glasgow, for example, the classes available for the architectural student are, with some trifling exceptions, open only during the winter months. The architectural class and the building construction class are over now, not to resume till October; so is the civil engineering class at the University (an important class for young architects nowadays to attend), and the classes generally. A school or college, independent of the existing subsidised institutions, would not pay. Students drawn chiefly from the middle classes cannot afford to pay high fees; they would certainly seek to obtain the necessary instruction where it could be obtained most cheaply.


Allow me, in conclusion, to express the hope that the Educational Board will not confine their attention too exclusively to the requirements of London, and that they may be able to devise a scheme which may be practicable in all the larger cities at least to which students from the country may resort, as they do at present, for the preliminary studies in Divinity, Law, and Medicine. JOHN HONEYMAN.

Glasgow, April 15, 1905.

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE-STEEL.—XVI.

A FRENCH VILLA RESIDENCE.—(Continued).

 IN this article we draw attention to some further constructive details of the concrete-steel villa at Bour-la-Reine. Fig. 111 is a plan of the floors of the first story viewed from below, and, for the purpose of identification, the names of the rooms on the ground floor are indicated, with the exception of the linen-room (*lingerie et resserre*) and servant's bedroom near the water tower and the bedroom in the nursery wing, all on the entresol. The *loggia* and the *balcon*, as lettered, are on the first floor level, being above the verandah-conservatory of the *salon* and the balcony of the *salle-à-manger* (see Fig. 106 ante).

The floors above the nursery and children's dining-room consist of single slabs of concrete-steel 14 centimetres thick, without intermediate support between the walls, and the adjoining bedroom on the entresol has a similar slab 10 centimetres thick. On the west side of the nursery wing the upper balcony is carried by four cantilevers projecting from the main walls, the octagonal tower being supported partly by the wall continuations mentioned last week and partly by the massive corbelling shown in Fig. 108 ante and in plan (from below) by Fig. 114. The balcony on the south side of the nursery is supported by three cantilevers.

Country Workshop Practice. By C. F. and G. A. MITCHELL. London: Cassell & Co., Ltd.

This book is a volume of the Polytechnic Series, and is specially adapted to the requirements of students at the Polytechnic Institute. It is a well-illustrated and business-like little book, and covers an immense deal of ground in a small space. The first two-thirds of the text are devoted to the description of tools and timber. As a rule these descriptions are too brief to be very useful, but they are as accurate and complete as possible that they should be in the allotted space. They would be entirely admirable given by a pupil to his teacher or examiner, or as given by the teacher to his pupils if often doubtful if they would convey much information except to the most intelligent. We note the last three of six lines describing the "Knickage of Timber": "The seasoned section of a piece of timber may be determined by imagining these plates (the medallary rays) to be ribs of a system (such as a fan) and closing upon its centre." As a terse, philosophical statement of the theory involved, this sentence could hardly be surpassed, but would it convey to the average student the necessary information as, for instance, that a board in drying goes convex on the side nearest the heart, and concave to a less extent on the side remote? Some of the illustrations, however, such as that of the function of the "cap iron" are all that can be desired.

After the chapter on "Tools" we have chapters on "Operations," "Joints," and "Fineries," from the most elementary up to the construction of curved work, and the rendering in patterns of plain and curved surfaces. Here, again, the work is good, but it still suffers from the continuous attempt at almost impossible brevity. The directions given are absolutely dry and formal, without "life" or any intelligent anticipation of the beginner's difficulties. Even so, however, these directions are often better and more useful than many of two or three times the length that we have read in other books on the same subject. They are written at all events by an craftsman in a thoroughly scholarly way, and this is more than can be said of the majority of such manuals on the useful arts.

Art Woods: English and Foreign. By PERCY A. WELLS. London: Percival Marshall & Co.

This little book is No. 5 of the "Woodworker" series, and should be useful to the amateur. It is, however, for the most part, clearly a compilation, and not always as careful as it ought to have been. Perhaps it is not fair to criticise it without reference to the preceding volume of the series, by the same author, on "Soft Woods," which we have not seen; but that volume, we are told in this, explains various methods of seasoning, and other important preliminaries. It is sincerely to be hoped that this is the case, for in the present volume the subject of natural seasoning is discussed on page 9 by the quotation of a *note* of Laslett's, which, in its new context, is very misleading. According to this table a piece of oak 8 in. square can be dried by the natural method in six months, whereas the ordinary allowance for drying oak plank is one year for every inch of thickness, and for good dry or cabinet-making this allowance is considerably less than it ought to be. The compilation of the discrepancy probably is that Laslett's table was written for carpenters; and no doubt an oak beam may very well be put into a timber roof long before it is dry enough to be used for more delicate work. Laslett's book is, in fact, a treatise on the strength of the material as applied to building construction, ship-building, etc., and was never intended to furnish data to the cabinet-maker or the amateur.

Mr. Wells' book is cleverly illustrated with pen-and-ink sketches, and should be useful up to a certain point in the identification of timbers; but he has described a good many which he is obviously not familiar.

JOHN BARNES, LOWREMOOR.—The opening of Lowreemor Baths took place a short time ago. The baths, both swimming and slipper, were erected at a cost of 10,000*l.*, the architect being Mr. Stevenson, of Oldham, and the architect, Messrs. Groom & Grant, of Manchester.

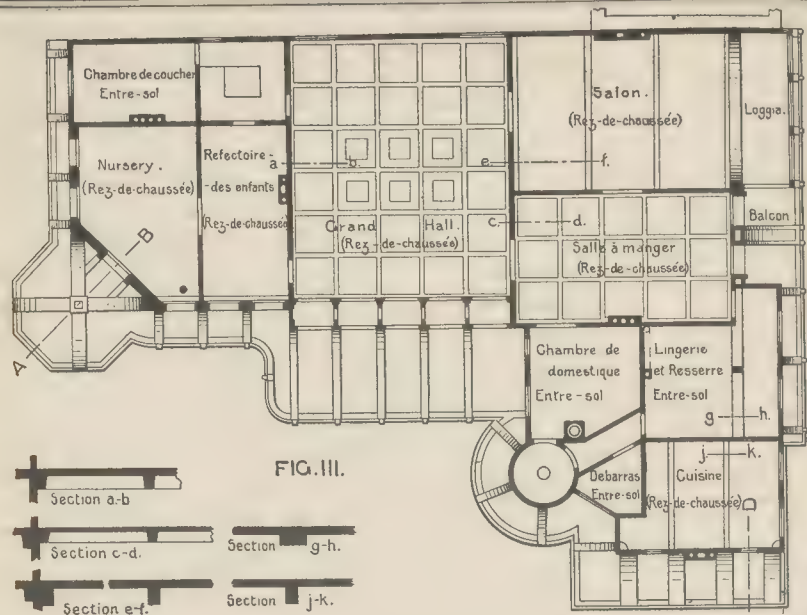


FIG. II2.

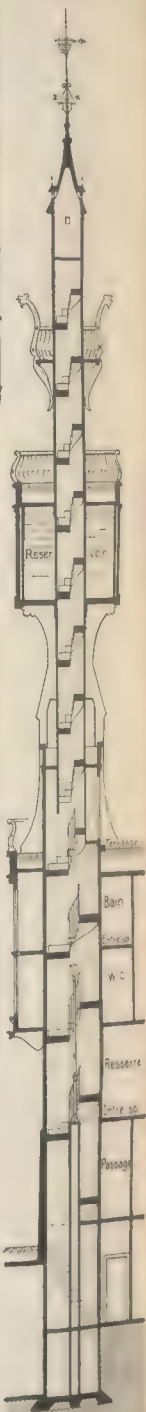
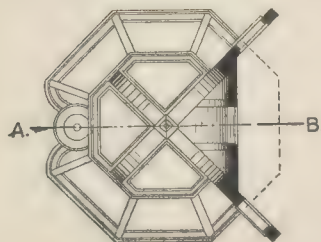
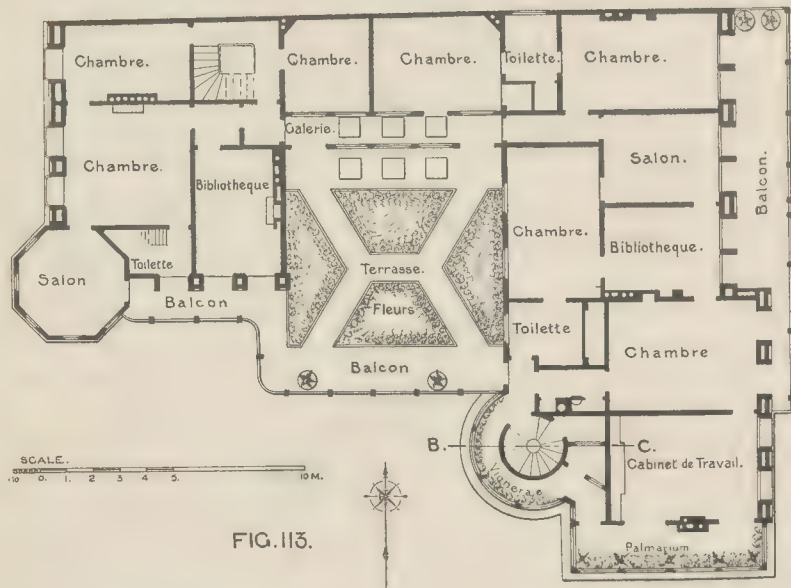


FIG. II6.

The bottom floor of the tower is 14 centimetres thick and the balcony floors are 10 centimetres thick.

Section *ab*, Fig. 112, shows the construction of the wall between the children's dining-room and the hall and a small portion of each floor slab, the thickness being 14 centimetres in the former apartment and 10 centimetres in the latter. It will be seen by Fig. 111 that the ceiling of the hall is divided into thirty square panels, each 1·60 metres square, by a series of longitudinal and transverse beams of equal cross-section. As shown by Fig. 112, the beams are 20 centimetres deep by 17 centimetres wide at the top and 12 centimetres wide at the bottom, but those at the walls, being supported on one side only, measure 14·5 centimetres wide at the top. In six panels over the middle of the hall ceiling lights of armoured glass 70 centimetres square are inserted, as shown in the plan. Fig. 111 also shows the corbelling, with a projection of 3·40 metres, supporting the balcony over the principal entrance to the villa.

The ceiling of the *salle-à-manger* is divided into fifteen square panels of the same dimensions as those in the hall. Support is given at the walls by tapered beams measuring 14 centimetres wide at the top and 12 centimetres wide at the bottom, while the intermediate beams are 10 centimetres wide at the top and 12 centimetres wide at the bottom, the projection below the floor slab in each case being 11 centimetres. The thickness of the floor slab itself is 6 centimetres (see section *cd*, Fig. 112).

The floor above the *salon* is divided into 12 rectangular panels each 5·70 metres long by 2·50 metres wide. The outer panels are supported by rectangular beams (see section *ef*, Fig. 112) projecting from the walls, the dimensions being 18 centimetres wide and 25 centimetres deep below the floor, and the intermediate beams are of the same dimensions.

Fig. 111 shows the supports of the balcony, with a floor 10 centimetres thick, extending from the kitchen wall to the north gable of the house. Part of this balcony is supported by corbelling of which the under side is shown in the drawing. The part lettered *loggia* is supported by the verandah outside the *salon*, and consists of a concrete-steel floor supported along its side by the front wall of the house and on the other side by the uprights of the verandah, as illustrated in Fig. 109 *ante*. Section *gh*, Fig. 112, shows the bressummer, 40 centimetres wide by 15 centimetres deep, beneath the linen-room on the entresol, the floor slab of this room being 10 centimetres thick. The other two rooms on the same level have floors 10 centimetres and 8 centimetres thick, respectively, without any intermediate support. The floor above the kitchen is divided into three panels, for which intermediate support is afforded by two concrete-steel beams each projecting 25 centimetres below the floor slab and having a width of 18 centimetres (see section *jk*, Fig. 112). The floor slab is 8 centimetres thick and the re-inforcement of the entire construction is connected with that of the walls.

The balcony outside the southern wall of the kitchen is carried by four massive brackets and has a floor slab 10 centimetres thick. It will be seen that this balcony is connected with the segmental gallery extending partly round the water tower, the latter construction being carried by three cantilever brackets and having a floor slab 10 centimetres thick.

Near the water tower will be observed a large flue, which is that proceeding from the hot-water boiler in the basement. This, together with all the other flues indicated in the plan, is constructed of reinforced concrete, monolithic with the walls of the building.

Fig. 114 is a view of the under side of the segmental tower at the angle of the nursery wing. This drawing shows clearly the design of the main corbelling described in Article XV, and the arrangement of the secondary corbelling extending to the outer walls.

Fig. 113 is a plan of the first floor of the villa. Communication between the various rooms on the eastern facade is conveniently afforded by the balcony previously mentioned as extending from the kitchen wall to the end gable. It is worthy of note that, with the object of minimizing the effects of extremes of temperature, the walls along this facade were built hollow, as shown in the plan and also in the section, Fig. 109 *ante*. The same method of construction has also been applied to the nursery wing.

The *cabinet de travail*, situated immediately over the kitchen, opens into the *palmarium*, which is a glazed verandah communicating by way of the *vigneraie* with the open-air terrace garden, which occupies a central position on this story. The glazed partitions, thus enclosing the *cabinet de travail*, serve the purpose of excluding any odours emanating from the kitchen without interfering with the ample supply of fresh air from the balconies on either side of the room.

The balcony of the terrace garden gives convenient outside access between the octagonal *salon* in the children's wing and rooms in the other portion of the house, while outside communication is afforded by the covered gallery which runs across the inner end of the terrace garden.

Fig. 115 is a plan of the *terrasse* of the octagonal tower. The inner area, covered with grass and planted with fruit trees, forms the roof of the kiosk over the small *salon* on the first story (see Fig. 108 *ante*).

As mentioned in Article XV., the whole of the flat roof at the top of the house is covered with earth to the depth of 1 metre, so that vegetables and flowers may be grown under favourable circumstances and to afford an adequate depth for the roots of shrubs and trees. Taking the weight of earth at 80 lb. per cubic ft., the metre depth of soil in the present case involves a dead load of 1,280 kilograms per square metre, to say nothing of the weight of the hothouse, which is situated along the northern wall of the building.

Although very considerable, this load is equal to only about one-half of that mentioned in connexion with the *Dépôt* of the *Compagnie Générale des Omnibus* (see Article VIII., p. 213), and presents no difficulty whatever to the concrete-steel designer. Of course, in a case such as that now in question, it is necessary that proper means of drainage should be provided and that the upper surface of the roof slab should be made impervious to moisture. These details, however, are perfectly easy of accomplishment, and the necessary resistance of the floor can readily be provided by the application of sufficient reinforcement to the concrete.

The most striking feature of the villa undoubtedly is the water tower to which incidental reference has already been made. The tower was built for the primary purpose of supporting a water reservoir with a capacity of 25 cubic metres at a height of 18 metres above the ground floor level, or 8 metres above the roof of the house.

The erection of a storage tank at this elevation was necessary to provide water at adequate pressure during the day, as supplies direct from the town mains were only available during the early hours of the morning. The tower also serves the purpose of providing convenient means of communication between the basement and the different floors of the building, as may be seen by reference to Figs. 106, 111, and 113. The top of the reservoir has been utilised as a balcony garden, and by continuing the tower still higher a second gallery and a small observation chamber were placed at the disposal of those desiring to enjoy a view of the surrounding country and to obtain fresh air far above the neighbouring houses.

In the design of the tower the architect has seized the opportunity of demonstrating the elasticity and homogeneity of concrete-steel, and from our present point of view the success of his demonstration makes amends for the somewhat incongruous appearance of the construction as an architectural detail of the villa.

Fig. 116 is a vertical section of the tower through the lines BC in Fig. 113. The total height from the foundation to the top of the vane is 40 metres, and, as may be seen by the drawing, the structure consists of two parts, one fitted into the other something like the joints of a fishing rod. The internal diameter of the lower portion is 2·50 metres, the thickness of the walls being 11 centimetres, except near the bottom, where a slight batter is established in order to permit the thorough connection of the tower with the lower walls of the facade. This was very properly regarded as a matter of much importance. The tube, of 2·50 metres diameter, continues up to the height of 3·50 metres above the terrace garden, and a few centimetres above the level of the latter the smaller tube commences, this portion having an internal diameter of 1·20 metres and a wall thickness of 5 centimetres. The socket formed by the overlap of the lower tube provides for

the doorway which gives access to the terrace garden.

The treads of the staircase in the lower tube are of concrete-steel, moulded in advance with a diagonal plate on the underside of each, so that when fixed in juxtaposition the undersides of the steps form a continuous ceiling over parts of the spiral staircase below. The treads were embedded to a depth of 3 centimetres in the concrete of the tubular wall. No string course was required at the inner ends of the treads, which terminate so as to form a central well-hole of 50 centimetres diameter. Up to the level of the entresol this well-hole is filled by a concrete-steel tube, as shown in the section, to shut off communication between the exterior and interior of the building, and upon the closed top of the tube a lamp standard is fixed.

The most interesting part of the tower is that above the terrace garden. As represented in Fig. 116, the staircase of the upper portion commences within the prolongation of the 2·50-metre diameter tube. In addition to the connections between the two tubes by horizontal members just above the terrace level and by the staircase, a secure fixing is furnished by the annular diaphragm of concrete-steel near the upper end of the larger tube. This diaphragm is utilised as the bottom of a receptacle for earth in which creepers and flowering plants can be grown.

Further, four radial counterforts, or buttresses, of concrete-steel, of which two may be seen in Fig. 116, are fixed outside and incorporated with the prolongation of the lower tube, above which they are carried inwards to stiffen the smaller tube, and continued up to the bottom of the water reservoir. The reinforcement of the buttresses is connected with that of the bottom, sides, and top of the reservoir.

The hollow shaft of the tower, with the reduced diameter of 1·20 metres and walls of 5 centimetres thick, passes through the centre of the reservoir to give access to the upper balconies and observation chamber. A horizontal section of this shaft, taken immediately above the concrete-steel cover of the tank, shows a ring of 1·20 metres diameter inside and 1·30 metres diameter outside, stiffened by four plasters of 20 centimetres width and 5 centimetres projection, the sectional area of concrete-steel being 2,364 square centimetres. A horizontal section taken immediately above the lower portion presents the same area of 2,364 square centimetres plus four exterior counterforts of 20 centimetres width and 30 centimetres projection, making a total area of 4,764 square centimetres. A horizontal section taken at the height where the counterforts are of minimum thickness gives an area of 3,960 square centimetres.

The construction of the upper portion of the tower can be very well defined as that of a tube fixed in a vertical position, having a height of 22 metres, an inside diameter of 1·20 metres, and an outside diameter of 1·30 metres, on which has been threaded and fixed about half way up, upon four exterior stays, an annular reservoir weighing about 45,000 kilograms, and above this a second annular ring represented by the upper balcony.

All the individual parts—comprising the tube, staircase, buttresses, reservoir, balcony, and spire—are monolithic, and the whole of the reinforcement is most thoroughly interconnected. The weight of the construction at the top of the lower portion of the tower—that is, at the height of 3·50 metres above the terrace—is about 100,000 kilograms.

It should be added that the wind pressure, according to its direction, imposes very considerable loads upon the counterforts at one side of the tower, while the opposite counterforts are practically relieved of load.

So far as concerns the end of the tube which extends above the reservoir is exposed to relatively rapid temperature changes, while, on the other hand, the part protected by the water in the reservoir is maintained at a temperature which varies very little indeed.

The flue of the hot-water boiler in the basement (see Fig. 113) passes through the terrace, then through the reservoir, in company with the shaft of the upper portion of the tower, and terminates at a convenient height above the balcony formed upon the top of the reservoir.

Finally, we may add that no leakage of water and no cracks in the shaft, counterforts, or other parts of the structure have been manifested during the two years which have elapsed since the reservoir was first put in service.

occupy the rear of the site and have a frontage to Edgely-road, space is left for building a church to overlook Abbeydale-road. The new schools are the design of Messrs. Hall & Fenton, architects, of Sheffield. The front part of the building and the boundary walls are of rock-faced stone, with ashlar dressings, and an exposed brick gable fronting to Abbeydale-road, but this will form an interior wall when the church is erected. On the ground floor is an assembly hall, measuring 6 ft. by 38 ft., and capable of seating 400 or more people. There are also three classrooms and a minister's vestry. Access to the ground floor is furnished by a stone staircase, which is provided with a couple of landings opening into small vestries. On the upper floor is a second assembly hall, corresponding with the one on the ground floor. There also are several classrooms, opening from the assembly hall and having their egress to the street. The place is heated by hot water. The contract for the building was let at £2,600, Messrs. F. Margerison, of Dronfield, being the contractors. The sub-contractors were: Joinery, Mr. J. Allen; plumbing, Mr. A. H. Ward; painting and plastering, Mr. C. H. Chadwick; hot-water engineers, Messrs. Stanley Sheen & Co., Sheffield; ironwork, Messrs. G. Oxley & Sons; railings, etc., Mr. Leonard Holling, Attercliffe-road; gas fittings, Sheffield United Gaslight Company; furnishing, Messrs. W. T. May, Abbeydale.

METHODIST CHURCH, WESTON.—A new church, with schools adjoining, has been erected by the members of the Weston United Methodist Church, at the corner of Birchington-terrace and Weston-parade. The new building has approximately cost 5,000. Messrs. W. Robertson & Sons, of South Shields, were the contractors, and Mr. Smith was the architect.

ELEMENTARY SCHOOL, EASTBOURNE.—On the site the foundation-stone was laid of the new public elementary school, which is being erected on a site near East-street, Eastbourne. Accommodation will be provided for 305 boys and a similar number of girls, and the total cost is estimated at 6,355, exclusive of the site. Mr. F. G. Cook is the architect, and Mr. Parker Dennis the contractor for the work.

RESTORATION OF CULROSS ABBEY.—A meeting of the Heritors of the parish of Culross was held in the Abbey church recently, when the following resolutions were agreed to:—(1) That the approval of the report and relative plans for the repair and restoration of the church, prepared by Sir R. Rowand Anderson, architect, be confirmed; (2) that the Heritors accept liability for the sum of £2,320, being the proportion of the total cost of the works, which the said report suggests should be undertaken by them.

CO-OPERATIVE PREMISES, MORPETH.—At Morpeth Town Council plans were recently submitted by Messrs. Liddle & Browne, architects, on behalf of the Ashington Industrial Co-operative Society, for the erection of new business premises in Morpeth, and passed. They are to be built at the corner of Newport-street and Copper Chase.

HOUSES BUILT IN LIVERPOOL.—Mr. William Calverley, Liverpool Corporation Building Surveyor, states in his annual report that during the past nine years 17,414 houses have been built in the city; last year 2,174 were erected, or 269 above the average of the previous eight years. West Derby tops the list of districts with 624 new houses; Walton is second with 525, although, taking the past ten years, the total is greatest in Wavertree. Value of the houses erected:—Under 121,000, 259 (all Corporation dwellings); 121,000, 234; 181, to 251, 1,067; 251, to 351, 449; 351 and upwards, 116. Besides 2,174 new houses, the following were erected:—Workshops, stables, and minor buildings, 110; new public buildings and manufactories, forty-one; new warehouse, one. The new buildings include baths, technical schools, free libraries, places of worship, of education, and of entertainment. Duties regarding the means of hygiene and egress of public buildings have been discharged by the building department. The buildings taken down numbered less than the average of the past eight years. These were:—Dwelling-houses, 283; workshops, stables, etc., twelve; public buildings, offices, and manufactories, ten. Of the 283 houses 111 were demolished by the Housing Committee. The work of inspecting and dealing with dangerous buildings last year was much above the average. The cost of the department for the year was £2,732, or about 20s. more than the previous year.

WHEATLEY MISSION HALL, HINSDALE, DURHAM.—A mission hall has been erected at Seaton Tine at an estimated cost of 3,500. The site of the new mission hall, which will provide seating accommodation for 400 persons, is situated at the corner of Milburn-terrace and Seaton-avenue. Sufficient space has been

reserved in the front of the site for the church. The entire outlay of the present scheme will be about 1,600. Mr. J. Walton Taylor is the architect, the contractor of the scheme being Mr. T. A. Turnbull, of Rowland's Gill, the ventilation, plumbing, and heating work having been carried out by Mr. Byles, of Newcastle.

ST. MICHAEL'S COLLEGE, LLANDAFF.—The contract for the first section of the new St. Michael's Theological College at Llandaff has just been let. The first section includes the administrative block, lecture hall, library, warden's rooms, etc., and the contract has been let to Mr. James Allan, J.P., at 8,650. The architect is Mr. F. R. Kempson, of Cardiff and Hereford, and the quantities were prepared by Mr. Charles Taylor.

MASONIC TEMPLE, HULL.—The new Masonic Hall of the De la Pole Lodge of Freemasons, situate in Osborne-street, Hull, was dedicated on the 4th inst. by the Right Hon. Lord Bolton. The new temple has been acquired by purchase from the Methodist New Connexion, and is within two minutes' walk of the tramway terminus in St. John-street. It has been completely gutted, and there are now only the outer walls left of the original building in Osborne-street. On the basement is the Masonic temple, 41 ft. by 28 ft. 6 in., and height, 15 ft. At the north end is the covered dais, 21 ft. by 10 ft. which is raised two steps above the floor of the room, and separated from the lodge by one elliptical and two semi-arches, supported by fluted Corinthian columns. The side walls have Corinthian columns and arches. Fibrous plaster squares, of about 8 ft. each, divide the ceiling, and the same material has been used for the girders supporting the room above. The side platforms are also raised above the floor of the lodge. Near the entrance to the temple is the organ. For heating purposes, high-pressure pipes are laid under the platform. The entrance hall is laid with mosaics, and from this access is gained to a corridor, 42 ft. long by 6 ft. wide. A mahogany staircase leads from this to the banqueting hall on the first floor. This hall is 43 ft. long by 24 ft. wide, 13 ft. high at the side walls, and 19 ft. high in the centre of the segment or curved ceiling. The roof of the building is carried on curved steel ribs, the side walls being ornamented with 12-in. Corinthian pilasters and caps. The ceiling is paneled, and executed in fibrous plaster relief. In addition there are the steward's room and other offices. The contractors for the structural alterations have been Messrs. S. Johnson & Son, Miffield; for the fibrous plaster and other work, Messrs. Harrison & Andrews, Hull. The works have been carried out under the superintendence of Mr. Ernest Whitlock, architect, Hull.

SANITARY AND ENGINEERING NEWS.

DURHAM SEWAGE SCHEME.—Mr. A. A. G. Malet, M.Inst.C.E., an Inspector of the Local Government Board, held an inquiry, at Durham, on the 12th inst., into an application by the Corporation of that city to borrow a sum of 15,539, in connexion with the new sewage disposal scheme. Mr. Taylor, the engineer of the new sewage scheme, informed the Inspector that a sewer put in Gilegate, at a cost of 2,449, had been abandoned. If the borough boundary was extended it was proposed to put in supplementary pipes to deal with the storm water, which at present in heavy rains flooded the districts of Alexander-crescent and the bottom of Western Hill, and to discharge it direct into the river. In dry weather the present sewers were amply sufficient. Mr. Taylor explained in detail the proposed new scheme.

VENTILATION OF THE HIGHWAYS AND HEALTH COMMITTEES OF SHOREDITCH BOROUGH COUNCIL. reported on Monday having considered a communication from the Lewisham Borough Council on the question of the ventilation of sewers and interceptors, and asking for co-operation in approaching the London County Council with a view to obtaining the repeal of the by-law relating to this matter, made under section 202 of the Metropolitan Management Act, 1855. The joint committee, having discussed a report from the Borough Surveyor, and a joint report from the Medical Officer and Chief Sanitary Inspector, and having taken evidence from the Borough Surveyor and the Medical Officer on the question of interceptors, passed the following motion:—“That the communication from the Lewisham Borough Council in so far as it relates to the placing of surface ventilators be received, and as to that portion of the letter dealing with interceptors we co-operate with Lewisham in approaching the London County Council to consider the question of repealing the by-law referred to.”

FOREIGN.

FRANCE.—The jury for the competition organised by the Fondation Rothschild, for the construction of buildings comprised of small sanitary and economical dwellings for the working classes, has chosen twenty-five out of the 127 competitors to enter for the final competition. The twenty-five chosen schemes are not classed in any order of merit.—The Municipal Council of Paris have refused to sanction the erection of a statue to Baron Haussmann, the late Prefect of the Seine. At the Ecole des Beaux-Arts M. Raoul Verlet, the sculptor, has been appointed professor of modelling in place of M. Coutan, who has been summoned to take up other duties; and M. Paul Dubois, whose health has been bad this winter, has resigned his position of Directeur, and will be replaced by M. Bonnat. M. Gustave Michel, the sculptor, has been appointed a member of the Conseil Supérieur of the Ecole, in place of M. Verlet.—A competition has been opened for designs for a new Hôtel de Ville at Bizerte.—The Department of Assistance of Paris has decided to erect, at Ivry-sur-Seine, a hospital for chronic invalids. It will be known under the name of “Asile de la Ville de Paris.”—M. Lorey, architect, has been instructed to carry out a new Mairie at Redon.—The President of the Republic is to preside at the inauguration, about the end of the month, of the monument erected at Bourges to the memory of Gambetta. The architectural portion of this monument is by M. Formigé, the sculptural portion is the latest completed work of Dalou.—The death is announced, at the age of 76, of M. Edouard Housaye, who was one of the founders of the *Gazette des Beaux-Arts* and of the *Chronique des Arts*.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—Messrs. Norman & Stacey, art furnishers, have closed their premises in Tottenham Court-road, retaining only their City offices at 118, Queen Victoria-street, E.C.

FLAT-BOTTOMED RAILWAY RAILS. In Report No. 11, the Engineering Standards Committee give the newly-settled “British Standard Specification of Flat-bottomed Railway Rails.” The work of preparing the dimensions and regulations governing the manufacture and testing of this type of rail section devolved upon a sub-committee under the chairmanship of Mr. James C. Inglis, of the Great Western Railway. The clauses of the specification are generally similar to those of the specification for tramway rails previously noticed in our columns. Two tables of dimensions are printed in the appendix, which also includes full-size drawings of the seventeen standard sections, ranging from 20 lb. to 100 lb. per yd., the increase of weight being 5 lb. for each successive section. The appendix contains, in addition, drawings of British standard tensile test pieces. These test pieces formed the subject of a separate report, which is now being reprinted in all other standard specifications to which it is applicable.

WAR MEMORIAL, ISLINGTON.—A memorial, in honour of ninety-eight Islingtonians who fell in the South African war, 1899-1902, will be unveiled on July 8, in Highbury Fields. The memorial, designed by Mr. Bertram Macken- nal, is in the form of a figure of Glory holding a statuette of Victory in her right hand, and in her left a laurel wreath. There will be in front an inscribed tablet, and, on either side, bronze tablets recording the names of the dead.

ARCHBISHOP TEMPLE MEMORIAL, RUGBY SCHOOL.—The committee of subscribers to the proposed Rugby Memorial to the late Dr. Temple have appropriated 300l. for the medallion portrait, executed by Mr. Brook, for the school chapel. The committee hope that a sum of about 11,000l. will be forthcoming for the erection of a new speech-room, in memory of the late prelate, upon a parcel of land which Dr. James, the headmaster, will make over for that purpose. After consideration the committee decided that the memorial should consist of a fresh and adequate speech-room, rather than of the originally projected new big school.

CEMENT NOTES.—In Canada, according to the preliminary official summary of last year's yield of minerals in the Dominion, the production of natural rock cement, which has for a number of years been small in comparison with the output of Portland cement, showed another large decrease, the sales being only 56,814 barrels, valued at \$49,397, as compared with 92,252 barrels, valued at \$74,655, in 1903. In the absence of complete returns, Portland cement statistics have been partially estimated. The following is, however, a close approximation:—Portland cement sold, 900,358 barrels, valued at \$1,272,992; Portland cement manufactured, 908,990 barrels; stock on hand

January 1, 1904, 124,918 barrels; stock on hand December 31, 1904, 133,551 barrels. It appears from Mr. Consul-General Schwabach's annual report that the exports of cement from Germany in 1904 amounted to 655,247 metric tons, as compared with 742,381 metric tons in 1903. This remarkable falling off was chiefly due to reduced shipments to the United States of America—viz., 94,100 tons against 221,700 tons in 1903. The shipments to the United Kingdom were only 29,000 tons, as compared with 36,000 tons in 1903, and 33,000 tons in 1902. The total value of the cement imported into Mexico in 1904 is estimated at 77,320. It is stated that during the past five years there has been in Mexico a very steady increase in the importation of limes and cement, due to the greater demand for such articles in the construction of buildings, roads, and public works.

JOULE MEMORIAL, SALE.—A bronze memorial of the late James P. Joule is shortly to be erected at Sale. The work is of heroic proportions, and will be, in all, 11 ft. high. The pedestal will be of stone or granite, and above it will rise, 4 ft. in height, the half-length figure in bronze. The sculptor is Mr. John Cassidy, of Manchester.

CHATHAM MASTER BUILDERS' ASSOCIATION.—The annual dinner of the Chatham and District Master Builders' Association took place at the Town Hall (minor hall), Chatham, recently, Alderman C. E. Skinner, the President, occupied the chair, supported by the Mayor of Rochester (Alderman F. E. Smith), the Mayor of Chatham (Councillor W. D. Driver), the Mayor of Gillingham (Councillor J. Bramley Riddout), Alderman R. D. Batchelor, Mr. A. B. Hearn, Mr. W. F. Wallis, Mr. G. E. Bond, and Mr. H. H. Dunstall. The loyal toasts having been honoured, Mr. Walter West gave "The President of the Southern Counties Master Builders' Federation," and, in coupling the name of Mr. W. F. Wallis, the President of the Association, with the toast, said he thought they might congratulate Mr. Wallis on being the first to move in the matter of trying to get the Local Government Board to do something to make it possible to build cheaper houses. It was a very serious question on the side of the housing of the working classes in the rural districts. So many difficulties were presented by the present by-laws that it was perfectly impossible for a working man to get a new house in a country district to live in. Another matter in which Mr. Wallis had done valuable service was in the matter of a conciliation board between master and men.—Mr. Wallis, in responding, congratulated the members upon the strength of their Association. A definite step had been taken in the direction of establishing conciliation boards composed of an equal number of representatives of trades federations and men's unions to deal with trades disputes, and he trusted when the proposal came before the local Association they would do their best to support it. It behoved them all, as men of common sense, to see whether some better means could not be found of arriving at an understanding than existed at the present time. From what he knew of his fellow members of the building trade they had no desire to oppress the men, but they felt they ought, as Englishmen, to resist what they felt to be unfair and coercive demands on the part of the men, especially in matters in which they thought the men had no right to interfere. As to the by-laws, Mr. Wallis said their extraordinary stringency, becoming almost a scandal. It seemed to him that they were, in many cases, getting somewhat under the domination of a grandmotherly system. He had good hope that the agitation which had been raised and fed largely by Mr. Justice Grantham might have some good result in the relaxation of by-laws.—Other toasts followed, including "Success to the Chatham and District Master Builders' Association," proposed by Mr. G. E. Bond, and acknowledged by Alderman Skinner, and "The Local Architects and the City and Borough Surveyors," proposed by Mr. Derrick, and responded to by Mr. H. H. Dunstall, Mr. C. Day, and Mr. J. L. Redfern.

THE PHOTOGRAPHIC SURVEY AND RECORD OF SURVEY.—The report of the Council for 1904 states that there is now a total of 1,272 photographs in the Survey collection. In pursuance of the policy of the survey to make its operations as widely known as possible, the hon. Survey Secretary will be glad to hear from secretaries and organisers of suitable exhibitions who may desire to exhibit a selection of photographs. In the architectural section the prints contributed during the year number 455, which may be classified thus:—Churches and church monuments, 367; public buildings, eighteen; private houses and business premises (not official), fifty-three; other erections, including bridges, seventeen. It is remarked that Croydon is far from complete.

The parish church, St. Mary Magdalene's, Shirley Church, and Christ Church, Addiscombe, are practically completed, but the remaining churches are poorly represented. There is a fairly full series of the Tower Hall, Whitgift's Hospital, and the Old Palace; a recent visit to the latter, however, by the Croydon Antiquities Protection Committee has brought to light some further points worth recording. There are other public buildings in Croydon, which should be photographed during the present year, and several houses which, from their interest and liability to disappear, should be recorded. It is pointed out that some knowledge of architecture and archaeological matters in photographing these subjects is necessary, in order to avoid the omission of points which may not be very conspicuous, but which are of the greatest importance.

UNIVERSITY COLLEGE ARCHITECTURAL SOCIETY.—This Society, which has recently been formed, held its first meeting at University College, Gower-street, on Thursday, April 6, when Mr. B. O. Fricker read a paper on "Glass and its Application to Domestic Glazing." Mr. Fricker first described in detail the manufacture of sheet and plate glass, explaining the materials used in each and the different processes each has to go through, and then dealt with the fixing, cutting, and leading of glass, and gave some useful advice regarding the size of panes, etc. At the conclusion of the lecture he showed a number of lantern slides, the most interesting of which were from photographs taken by him inside a glasshouse, showing workmen engaged in the different processes he had described in his paper. The meetings will be held fortnightly, and all the papers to be read will deal with practical subjects. The next paper will be by Mr. E. J. Fowler, on "Architectural Lead-work," to be followed by one by Mr. A. C. Hobbs, on "Reinforced Concrete." The Secretary of the Society is Mr. E. J. Whitley.

COVENT GARDEN MARKET.—For a further extension of the flower market the site is being cleared of several houses and shops at the corner west of Wellington and Russell streets. Messrs. Lauder, Bedells, & Crompton have been appointed architects to the Duke of Bedford for the new buildings. That firm made the plans and designs of the premises, for the foreign flower traffic, recently erected on an adjacent site on the north side of Tavistock-street.

QUEEN VICTORIA MEMORIAL, ST. HELENA.—The memorial of the late Queen, which has been erected in this town, was unveiled on the 15th inst. The stone pedestal on which the statue is placed is 11 ft. high and 6 ft. square. The bronze statue, which is 10 ft. 6 in. high, and weighs about five tons, represents Queen Victoria seated on the throne in her Royal robes, wearing the crown, and holding the sceptre and orb. The sculptor was Mr. George G. Frampton, R.A.

CRYSTAL PALACE ENGINEERING SCHOOL.—Wilson Premiums for the best papers read before the Crystal Palace Engineering Society during the present session have been awarded by the Council to two students—namely, Mr. W. D. Cornwell, for his paper on "Steam Boilers," and Mr. J. R. W. Teasdale, for his paper on "Bridge Construction in India." Other papers read during the session were "Gas Works," by Mr. N. E. West, and "Winding," by Mr. I. Minnow. The Premiums were presented to Messrs. Cornwell and Teasdale by Mr. J. C. Hawkshaw, Past-President of the Institution of Civil Engineers, on the occasion of the ninety-seventh distribution of certificates at the school on Friday, April 14.

PLANT FOR MAKING CEMENT BRICKS.—The following is a brief description of an installation which has been found very satisfactory on the Continent for making Portland cement bricks. The plant comprises a lift for materials, a mixing machine, a hydraulic moulding machine, a high-pressure pump, and an accumulator. The method of procedure is as follows:—The box of the lift is filled with sand, cement, and lime, and the lift is set in motion by pulling a cord. On arriving at a point just above the mixing machine the box is emptied automatically by suitable mechanism; it then descends and stops at the starting point, both of these operations being performed automatically. The sand, cement, and lime are thoroughly incorporated in the mixing machine by means of cast-steel arms attached to a central shaft. At the bottom of the mixing machine is the outlet, closed by a sliding door. From this the mixture passes in a shoot, and is delivered upon the table, where it is filled into moulds by a workman. The filled moulds are transferred by a movement of the machine to the top of the hydraulic cylinder, and the material is immediately subjected to pressure. Another movement carries the material to the workman whose duty it is

to receive the bricks as they are automatically delivered from the matrix. This workman places the bricks in a small truck by which they are transferred to the storehouse. The workman then cleans the piston of the press, and the mould is mechanically returned to the first man for refilling. The plant is said to be capable of producing about 6,000 small bricks or about 3,000 large bricks per day of eleven hours. For the manipulation of the moulding machine two men are required, apart from those engaged in transporting the finished bricks to the storehouse. Eight moulds are supplied with each machine—four for small bricks and four for large bricks. It may be added that the pressure upon each brick is made lightly at the commencement of the stroke and afterwards with more power, with the object of economising the consumption of water.

DESTRUCTUR EXTENSION, STOCKTON.—At Stockton Town Hall, on the 11th inst., Mr. A. G. Males, M.Inst.C.E., Local Government Board Inspector, held an inquiry into the application of the Council for permission to borrow 2,500*l.* for the purpose of extending the destructor. Mr. M. H. Sykes, Borough Engineer, gave evidence, stating that the present destructor, which was of the Horizontal pattern, was opened in 1901, and had two cells, with a capacity of twenty tons per day. It was proposed to add two more Horizontal cells, and to extend the building so that there would be room for another boiler and four more cells. After further information as to the system for dealing with the night soil and refuse had been given, the inquiry closed.

CAPITAL AND LABOUR

EMPLOYMENT IN THE BUILDING TRADES.—The returns received from eighty-three employers' associations show that employment generally was dull, but rather better than a month ago. It continued worse than a year ago. Employment with carpenters and joiners continued bad. It was better than a month ago, but worse than a year ago. The percentage of unemployed trade union carpenters and joiners was 79 at the end of March as compared with 86 in February and 67 a year ago. With plumbers employment was bad in England, and worse than a year ago. In Scotland it was moderate, and better than a month ago. The percentage of unemployed trade union plumbers was 118 at the end of March, compared with 125 in February and 94 in March, 1904. With bricklayers employment generally was dull, and about the same as a month ago. With masons it was bad, and slightly worse than a year ago. With plasterers it was bad in England, in Scotland it was rather better than a month ago. With slaters and tilers it was dull, and worse than a month ago in England, but slightly better in Scotland. With painters employment improved, but it was worse on the whole than a year ago. With builders' labourers employment was slack generally. *Labour Gazette.*

STONEMASONS' WAGES, NEWCASTLE.—The Newcastle branch of the Operative Stonemasons' Society recently held a meeting at which the result of the interview with the Newcastle and Tyne District Building Trade Employers' Association was considered, and also the reduction of one penny per hour proposed by the masters, and alterations in the rules governing employers and employed. The ultimate decision came to was that the masters were not being exact in their demands, their reasons not being exact and sufficient, and the result of the conference is to be communicated to the Employers' Association. At the same time, though the masons express dissent with the proposal of the masters, they are just as anxious as they were for an amicable settlement of all matters in dispute.

JOINERS' STRIKE, EDINBURGH.—The operative joiners of Edinburgh, who came out on strike on the 15th inst., had a meeting during the forenoon in St. Cathbert's Hall, King's Stables-road. Between 400 and 450 men were present, the number affected by who was and the chairman (Mr. John Lawson) of the committee, accompanied by two members of the committee, said it augured well for the cause of the men that so many were perfectly satisfied with the working. He was perfectly satisfied with the way the men had turned out, and even the shop of the chairman of the Masters' Association was almost clean. After the report had been submitted, a strike roll made up. It was appointed, and a strike roll made up. It was reported during the course of four masters employing in noon that other four masters employing in all over fifty men, had agreed to sign the by-laws on the old terms, and there was a feeling among the operatives that a settlement of the strike would be arrived at during the week.—*The Scotsman*

Legal.

WIMBLEDON DRAINAGE DISPUTE.

The case of *Jackson v. Wimbledon* Urban District Council came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Mathew and Cozens-Hardy, on the 7th inst., on the appeal of the Wimbledon Urban District Council from a decision of a Divisional Court of King's Bench, consisting of the Lord Chief Justice and Justices Wills and Kennedy, the case raising an important question under section 19 of the Public Health Acts Amendment Act, 1890.

The matter came before the Court in the form of a special case, stated by the justices of Surrey, from which it appeared that Mr. Jackson, on August 19, 1903, was summoned by the District Council for default in payment of 38s. to the Council alleged to be due from him, being the amount of expenses incurred by the Council in the execution of certain works in relaying the main drain at the rear of Nos. 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, and 73, Hartfield-crescent, Wimbledon, and also for default in payment of 13s. 7s. 6d., being a proportion of the expenses incurred by the Council in the execution of certain works in relaying a single sewer in a drain connecting No. 73, Hartfield-crescent, and No. 75, Hartfield-crescent, and belonging to a different owner, with the public sewer. It appeared that on the north side of Hartfield-crescent Mr. Jackson was the owner of twelve houses, numbered 51 to 73, inclusive. Mr. H. Holliday was the owner of the house, No. 75, and Mrs. Eysoldt was the owner of the three houses Nos. 77, 79, and 81. At the rear of these sixteen houses there ran a main or common drain which was connected with the public sewer in Hartfield-crescent by a branch drain, which ran between the house No. 73 and the house No. 75, at about right angles to the road under a narrow piece of land between the two houses which was unoccupied. Each of the sixteen houses connected with the main drain by means of branch drains, which conveyed the sewage from each of the houses to the main drain, and thence through the branch drain into the public sewer in Hartfield-crescent. The main or common drain and the branch drain were constructed wholly upon private property. On November 26, 1902, the local authority received notice that the drains belonging to Nos. 77 to 81 (odd numbers) inclusive, Hartfield-crescent, were a nuisance, and, upon examination, it was found necessary for the drains at the rear of Nos. 75 and 77 to 81 (odd numbers) inclusive to be opened up and examined. Upon inspection it was found that the whole of the main or common drain was in a bad condition, and the local authority served on the owners and occupiers of the said sixteen houses notices in writing to do the necessary works. By the owners of the premises 75, 77, 79, and 81 executed the works to the satisfaction of the local authority so far as affected the main or common drain at the rear of the premises, but they made default in executing the works required to be done to the branch drains and the main or common drain, and the local authority executed the work and apportioned the cost of the works executed in the same before mentioned. Mr. Jackson, having made default in complying with the demand, was summoned before the justices by the local authority, and the question for their decision was whether, having regard to all the facts, the drain used for the drainage of the houses Nos. 51 to 73, all of which belonged to Mr. Jackson, was a single private drain within the meaning of section 19 of the Public Health Acts Amendment Act, 1890. At the hearing before the justices, it was admitted, on behalf of Mr. Jackson, that the joint drain, between the houses Nos. 77 to 81, Nos. 75, and Nos. 51 to 73 was a single private drain within the meaning of section 19 of the Act of 1890, but it was contended, on his behalf, that the main or common drain between the points marked B and C on the plan was a sewer within the meaning of section 4 of the Public Health Act, 1876, and not a single private drain connecting two or more houses belonging to different owners with a public sewer within the meaning of section 19 of the Act of 1890. The contention of the local authority was that the system of drainage comprehended the drainage of the whole of the sixteen houses Nos. 51 to 81 (odd numbers) inclusive, Hartfield-crescent, and which houses belonged to different owners, and formed in fact one entire drain connecting the whole of the sixteen houses with the public sewer; that, therefore, the full length of the main or common drain and the branch drain—the joint drain from the houses of the three owners—were capable of being dealt with under section 19 of the

Public Health Acts Amendment Act, 1890, as a single private drain within the meaning of that section. The justices decided the case in favour of the contention of the local authority. Mr. Jackson then appealed to the Divisional Court, and his appeal was allowed, their lordships holding that the magistrates were wrong in coming to the conclusion that the portion of the drain or conduit between the points C and B—the main or common drain at the rear of Mr. Jackson's houses—was a drain within the meaning of the Public Health Acts, and not a sewer. Hence the present appeal of the local authority. No question arose on the appeal before the Divisional Court or before the Court of Appeal on the question of the joint drain from the houses of the three owners—viz. Mrs. Eysoldt, Mr. Holliday, and Mr. Jackson.

Mr. Macmorran, K.C., and Mr. Geo. Humphreys appeared for the appellants, and Mr. Sylvain Mayer for the respondent.

At the conclusion of the arguments of counsel the Master of the Rolls, in giving judgment after stating the facts, said that the Lord Chief Justice and Mr. Justice Wills had followed up the course of the drain in question, and they said—and his lordship saw no answer to it—that, because at a certain part of the transit of the sewage the sewage passed through a single private drain, that did not suffice to constitute it a single private drain. He thought that the judgment of the Divisional Court was right and ought to be affirmed.

The Lords Justices concurred, and the appeal was accordingly dismissed, with costs.

TO CORRESPONDENTS.

A. B. (Amounts should have been stated). NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications, and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses. Any communication to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, which is received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.	
April 5.—By KEMSELEY (at Romford). Romford, Essex.—23, Victoria-rd., and building plot adjoining with buildings thereon, f. p.	£1,490
Hornchurch-rd., a block of freehold building land, f. p.	200
Oldchurch-rd., two blocks of building land, f. p.	1,010
Oldchurch-rd., "Black Cottage" and land adjoining, f. p.	450
88, 90, and 92, Albert-rd., f. w. 551. 18s.	690
George-st., a plot of freehold building land 73 and 77, George-st., f. w. 311. 4s.	285
44 to 53 (even), Richmond-st., f. w. 791. 6s.	800
April 6.—By MARLER & Co. Streatham.—Furzedown-rd., "Furzedown Park Estate" with four residences and cottage thereon area 123 acres, f. y. 5301.	17,000
Fulham.—561 to 557 (odd), King's-rd., u.t. 493 yrs., g. r. 181, w. 1801.	1,005
By C. C. & T. MOORE Dalston.—121, Sandringham-rd. (s.), f. y. 401.	650
Clapton.—125, Redingham-rd. (s.), f. y. 261.	690
By STIMPSON & SONS. Deptford.—38, Adolphus-st., u.t. 57 yrs., g. r. 28, w. 83. 12s.	276
Canmore-rd., u.t. 181 yrs., g. r. 81, y. 401.	160
Camberwell.—14, Windsor-st., u.t. 49 yrs., g. r. 101, w. 521. 12s.	410
Dulwich.—57, Upland-rd. (s.), u.t. 74 yrs., g. r. 71, y. 361.	285
Sidcup, Kent.—Hatherley-rd., six named freehold residences, also 5, Alma-villas, f. y. 252.	2,425
Hatherley-rd., three named residences, u.t. 76 yrs., g. r. 801, y. 1181.	720
1 and 3, Myford-villas, f. w. 412. 12s.	400
By MONTAGU HOLMES & SONS. Paddington.—61, Waverley-rd., f. w. 631. 14s. 4d. and 48, Lydford-rd., u.t. 58 yrs., g. r. 141, w. 1072.	335
Batons-rd., 2 to 32 (even), Latchmere-st., u.t. 601 yrs., g. r. 401, w. 3741. 8s.	7,725
Chelsea.—34 to 48 (even), Stanley-rd., u.t. 711 yrs., g. r. 391. 18s. 6d., w. 2161. 5s.	1,000

Shepherd's Bush.—24 to 40 (even), Westville-rd., u.t. 71 and 90 yrs., g. r. 581. 10s., y. 2501.	£2,230
Hemel Hempstead, Herts.—2, 3, and 4, Union-st., f. w. 271. 6s.	105
By NEWBORN, EDWARDS, & SHEPHERD. Hackney.—246, Victoria Park-rd., u.t. 481 yrs., g. r. 121. 2s., e. r. 551.	480
Hornsey.—1, 14, and 23, Park-av. South, u.t. 94 yrs., g. r. 251. 4s., y. 1301.	1,225
Pentonville.—5, Holford-pl., u.t. 27 yrs., g. r. 61, y. 441.	355
Barnsbury.—11, Mulhol-st., u.t. 181 yrs., g. r. 41. 4s., y. 321.	160
21 and 22, Oxford-st., u.t. 331 yrs., g. r. 81, y. 511.	450
Tottenham.—7 and 26, Vincent-rd., u.t. 791 yrs., g. r. 111. 6s., y. 641.	400
By WAGSTAFF & SONS. Barnsbury.—184, Copenhagen-st. (s.), u.t. 351 yrs., g. r. 61, y. 501.	360
Holloway.—19, St. John-villas, u.t. 49 yrs., g. r. 61. 10s., e. r. 401.	340
By T. WRIGHT. Clapham.—Narbonne-av., mission room and yard, f. y. 551.	850
59, 61, and 63, Hambolt-rd., f. y. 1141.	1,235
81, Elms-rd., u.t. 75 yrs., g. r. 101, y. 551.	545
83, Abbeville-rd., u.t. 75 yrs., g. r. 91, y. 451.	425
Brixton.—10, Winterwell-rd., u.t. 68 yrs., g. r. 71. 18s. 3d., y. 441.	430
16 and 18, Winterwell-rd., u.t. 68 yrs., g. r. 101. 5s., y. 881.	580
Herris Hill.—8, 8, and 16, Beacon-rd., u.t. 61 yrs., g. r. 141, y. 1041. 14s.	770
102 and 108, Norwood-rd., u.t. 75 yrs., g. r. 381, y. 1051.	2,045
April 7.—By J. & R. KEMP & Co. High Holborn.—Nos. 240 and 241 (s.), f. y. 2051.	3,300
No. 236 f.g.r. 601, reversion in 2 yrs.	3,550
Camden Town.—3, Rochester-sq., u.t. 49 yrs., g. r. 61, p.	445
By MATTHEWS, MATTHEWS, & GOODMAN. City.—7, Eastcheap (s.), u.t. 11 yrs., g. r. 201, y. 1801.	1,350
Highgate.—59, North-bill, c. y. 651.	785
Spitalfields.—Brick-la., f.g. rents 201, reversion in 2 yrs.	1,370
Brick-la., f.g. 111. 10s., reversion in 2 yrs.	1,125
Edmonton.—102 to 112 (even), Sheldon-rd., u.t. 90 yrs., g. r. 251. 4s., w. 1171.	450
By TOWERS, ELLIS, & Co. Bayswater.—15, Talbot-rd., u.t. 48 yrs., g. r. 61, p.	500
By T. B. WESTACOTT. Barnsbury.—3, Everdale-st., u.t. 39 yrs., g. r. 21. 12s., y. 501.	275
By WINDRUM & CLARKE. Poplar.—229, High-st. (s.), f. y. 381.	560
Bow.—80, Malmesbury-rd., u.t. 42 yrs., g. r. 41, w. 371. 14s.	275
April 10.—By KEMSELEY'S. Buckhurst Hill.—Queen's-rd., "Milton Cottage," f. p.	700
Romford, Essex.—1, Park-villas, f. p.	600
Hare-st., enclosure of freehold building land, 2 a. 2 r. 19 p.	800
By STIMPSON & MOORE. Brockley.—11, Endwell-rd., u.t. 70 yrs., g. r. 61. 10s., e. r. 381.	330
Peckham.—24 and 26, Marmon-rd., u.t. 51 yrs., g. r. 101, w. 781.	530
April 11.—By ANSCOMBE & RINGLAND. Regent's Park.—3, St. Edmund's-ter., u.t. 141 yrs., g. r. 121, y. 501.	320
By J. BAKER, COOPER & Co. Mill Hill.—Dean's-la., a freehold enclosure, 4 a. 1 r. 12 p.	800
Halo-la.—A few Tree Farm House and freehold land, 1 a. 1 r. 12 p.	1,300
Dean's-la., freehold pasture land, 11 a. 2 r. 32 p.	1,375
By WALTER HALL. Willisden Green, Surrey.—74, 76, and 78, Churchill-rd., u.t. 33 yrs., g. r. 181, e. r. 961.	700
By S. WALKER & SON. East Molesey, Surrey.—Armon-rd., f.g. rents 181, reversion in 70 yrs.	450
Hayes, Middlesex.—Yeadley-la., 46 a. 42, reversion in 50 yrs.	900
By WYER, ADAMS, & GLOVER. Clapham.—High-st., "The Royal Oak" n.b., freehold rental of 831, reversion in 91 yrs.	3,000
By HEEPER & SONS (at Leeds). Roundhay, Yorks.—A freehold residence and grounds, area 2,281 yds., p.	1,750
By C. W. PROVIS & SONS (at Manchester). Leigh, Lancs.—"Bedford Lodge Farm," 56 a. 1 r. 6 p., f. y. 1001. (including minerals)	10,100
Astley, Lancs.—"The Sports" and "Parnell Pitts" farms, also "Tyldesley Fields," 130 a. 2 r., f. y. 2351. 10s.	15,475
By R. W. MANN & SON (at Swansea). The Swansea, Glamorgan.—Oxford-st., "The Waterloo Hotel," a freehold rental of 2001, reversion in 18 yrs.	7,000
10 and 11, Oxford-st. (s.), f. y. 2651.	7,575
14, Waterloo-st. (office and warehouse), f. y. 521. 10s.	1,155
By DEWAR, KNIGHT & Co. (at Waltham Cross). Waltham Cross, Herts.—Kings-rd., an enclosure of building land, 2 a. 1 r. 16 p., f. y. 2351. 10s.	560
Enfield Town.—Lavender Hill, enclosure of building land, 2 a. 0 r. 27 p., f.	350
By PERKINS & SONS (at Southampton). Southampton.—Denzil-av., a piece of freehold building land	480
April 12.—By C. O. H. BROWN. Pimlico.—7, Johnson's-pl., u.t. 191 yrs., g. r. 51, w. 541. 12s.	230
By S. B. CLARK & SON. Regent's Park.—6, York-ter., u.t. 16 yrs., g. r. 101. 10s., p.	1,780
Hyde Park.—71, Westbourne-ter., u.t. 321 yrs., g. r. 211, y. 2001.	2,165

By BUNCH & DUKE.	
Streatham—23, 30, and 32, Greyhound-la., u. 61½ yrs., g.r. 104, w.r. 1204	2716
19 and 21, Colmer-st., u. 61½ yrs., g.r. 61, 10s., w.r. 494, 8s.	255
Clapton—1, 3, 4, 5, 6, and 7, Lawley-st., u. 69 yrs., g.r. 301, 10s., y.r. 2044	1,850
Stoke Newington—13, Benhall-rd., u. 69½ yrs., g.r. 61, y.r. 324	355
By E. H. HENRY.	
Clapham Common—West Side, "Devon House," f. p.	2,990
By MARK HUBBARD.	
Kentish Town—2 and 4, Boscawle-rd., u. 47½ yrs., g.r. 12, y.r. 1151	1,200
By HUMBERT & FAIR.	
Marlow, Bucks.—Station-rd., "Seaburn House" with contractor's yard, f.	535
High-st., two freehold corner s., y.r. 321 ..	685
63, 64, and 65, High-st. (s.), f. y.r. 904 ..	490
65, High-st., f. y.r. 284 ..	125
Institute-rd., f. g. r. 51, reversion in 75½ yrs. Station-rose, two freehold building plots ..	100
62, High-st. (s.), f. y.r. 552 ..	900
55, High-st., with builder's yard, f. y.r. 401 52, High-st. (s.), f. y.r. 134 ..	420
High-st., two freehold s. and stables, y.r. 684 ..	1,475
46, 49, and 50, High-st. (s.), f. y.r. 1111 ..	2,500
High-st., f. g. r. 48, reversion in 67 yrs.	1,220
High-st., freehold shop and premises, y.r. 301 ..	610
Market-sq., three freehold s. and premises, y.r. 1552 ..	3,500
Market-sq., freehold shop, slaughter house, etc., y.r. 674 ..	1,600
Spital-st., two freehold s., y.r. 594 ..	1,275
Spital-st., five cottages and three s., f. y.r. 604 ..	950
Spital-st., smithy, workshops, and two cottages, f. y.r. 254 ..	540
Crown-la., two cottages and barn, f. w.r. 274 6s.	300
Chapel-st., freehold workshop and smithy, y.r. 121 ..	200
Chapel-st., sixteen freehold cottages, w.r. 1612 5s.	1,575
Chapel-st., freehold house and shop, y.r. 154 Chapel-st., freehold house and builder's yard, y.r. 204 ..	330
490	
April 13.—By BALCH & BALCH.	
Kentish Town—Dartmouth Pk. Hill, "Dart- mouth Tower," u. 47 yrs., g.r. 102, p.	1,550
100, Galsford-st., u. 44 yrs., g.r. 84, 8s., y.r. 484 ..	455
Camden Town—14, Murray-st., u. 40 yrs., g.r. 104, y.r. 44 ..	355
By J. BARTON & CO.	
Southwark—23, 24, and 26, Colnbrook-st., u. 23½ yrs., g.r. 154, y.r. 1204 ..	985
Canterbury—37, Grosvenor-pk., u. 14 yrs., g.r. 54, y.r. 384 ..	195
Poplar—36 and 38, Brunswick-st., f. w.r. 574 4s.	585
By NEWBORN, EDWARDS, & SHEPARD.	
Baywater—44, Archway-st. (s.), u. 39½ yrs., g.r. 74, 7s., y.r. 552 ..	250
86, Archer-st. (s.), u. 30½ yrs., g.r. 54, y.r. 504 ..	470
Illington—54, Britannia-row, f. w.r. 384, 10s. Highbury—10, Myrtle-st., f. w.r. 234, 8s.	325
Barnsbury—1, Copenhagen-st. (s.), u. 14 yrs., g.r. 44, y.r. 504 ..	185
Canbury—20, Fetham-rd., u. 44 yrs., g.r. 94, 9s., e.r. 804 ..	550
Clapton—166, Glyn-rd. (s.), f. y.r. 454 ..	650
Homerton—24, 26, and 28, Dight-rd., f. w.r. 784 ..	870
Bow—83, Tredgar-rd., f. y.r. 344 ..	615
Forest Gate—23 and 25, Brownlow-rd., f. y.r. 404, 10s.	410
Ilford—54, Cambridge-rd., u. 99½ yrs., g.r. 54, 1s., e.r. 264 ..	230
By STIMSON & SONS.	
Walworth—33, Penrose-st., area 3,200 ft., f., u. 504 ..	630
Canterbury—22, D'Eynsford-rd., and 2, Kington-rd., u. 48½ yrs., g.r. 64, w.r. 744 2s.	555
Peckham—7, Peckham-rd. (s.), u. 29½ yrs., g.r. 64, 10s., y.r. 504 ..	760
241 and 243, Hollydale-rd., u. 67½ yrs., g.r. 44, 13s. 4d., w.r. 654 ..	520
Beckenham—95 and 97, Mackenzie-rd., u. 79½ yrs., g.r. 94, w.r. 624, 8s.	400
Acton—16, York-rd., u. 63 yrs., g.r. 64, 6s., w.r. 304, 8s.	215
Tottenham—9 to 17 (odd), Fairbourne-rd., u. 92½ yrs., g.r. 304, y.r. 1824 ..	1,050
Stratford—27, Hamfrith-rd., f. e.r. 564 ..	520
Walthamstow—Manby-rd., six freehold build- ing plots ..	110
By H. J. BLISS & SONS.	
Bromley-by-Bow—38 and 40, Spey-st., u. 80 yrs., g.r. 64, w.r. 674, 12s.	480
Hackney—19 and 61, Frampton Park-rd., u. 32½ yrs., g.r. 104, 10s., w.r. 1044 ..	450
Old Ford—6, 7, 9, and 11, Monteth-rd., f., w.r. 104, 6s.	1,140
Woodford—Clarendon-rd., a freehold building plot ..	120
By JOSEPH STOWER.	
Wandsworth—Gatfield-lane, "Dunt's Hill House" (site of), area 3½ acres, f. p.	3,500
By DANIEL WATNEY & SONS.	
City of London—30 and 37, King-st., 12, Trumpet-st., and 4, 4½, and 5, Lawrence-lane, area 4,080 ft., building lease for 80 yrs. let at per annum ..	2,225
By WM. WESTON.	
Gray's Inn-road—25, Acton-st., u. 87 yrs., g.r. 74, 10s., p.	500
By FARRINGTON, BLISS, & CO.	
West Kensington—40, 42, 44, 46, 48, 50, 60, 67, 75, 78, and 74, Edith-rd., u. 70 yrs., g.r. 114, 10s., y.r. 664, (in lots) ..	5,050
21, 23, and 45, Tavistock-rd., u. 70 yrs., g.r. 304, y.r. 1654 ..	1,295

April 14.—By CHADWICK & SONS.	
Lewisham—2, 3, 5, and 6, Merle-st., u. 27 yrs., g.r. 164, w.r. 324, 12s.	5470
4, Eastdown-pk., f. y.r. 464 ..	560
47 and 49, Eastdown-pk., f. y.r. 854 ..	820
Eastdown-pk., a freehold building site	440
22 and 24, Westdown-rd., f. y.r. 654 ..	730
Sutton, Surrey—1 to 5, Palmerston-cottages, f., w.r. 834 ..	560
By NICHOLAS, DENYER, & CO.	
Tenterden, Kent—"Belcot Farm," 68 a. 2 r. 28 p. 1, f. p.	1,850
Kenningington, Kent—"The Firs" and O a 2 r. 0 p. 1, f. p.	625
Walworth—223, Hillingdon-st., u. 45½ yrs., g.r. 44, w.r. 364, 8s.	250
By SHADRAKE & TAYLOR.	
Leyton—218 and 215, Vicarage-rd., u. 91½ yrs., g.r. 114, y.r. 504 ..	400
By WILFORD, DIXON, & WINDLER.	
Belgrave—47, Euston-st.-mews, u. 23 yrs., g.r. nil, y.r. 464 ..	855
Hyde Park—3, Junction-mews, u. 24 yrs., g.r. nil, y.r. 854 ..	205
Victoria Park—118, Grove-rd., u. 38 yrs., g.r. 44, 4s., y.r. 344 ..	800
107 and 109, Grove-rd., u. 31 yrs., g.r. 104, y.r. 724, 16s.	595
Conductions used in these lists—L.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; l.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; o. for copyhold; l. for leasehold; p. for possession; s. for estimated rental; w.r. for weekly rental; q. for quarterly rental; y. for yearly rental; u. for unexpired term; p. a. for per annum; y. for years; l. for lane; st. for street; rd. for road; sq. for square; pl. for place; ten. for tenement; cres. for crescent; av. for avenue; gds. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for office; a. for shops; ct. for court.	

MEETINGS.

APRIL 20 to 25.	
Architectural Association Camera and Cycling Club.— Easter Excursion: Hereford, etc.	
SATURDAY, APRIL 22.	
Edinburgh Architectural Association.—Visit to Drum Glen, Gilmerton.	
THURSDAY, APRIL 27.	
Institution of Electrical Engineers.—Discussion of Mr. B. J. Arnold's Address to the Joint Meeting at St. Louis On the Problem of the Alternate Current Motor Applied to Traction, and Mr. F. Creed's Paper "The Alternate-Current Series Motor." 8 p.m.	

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PRICES CURRENT OF MATERIALS.

"Our aim in this list is to give, as far as possible, the
average prices current in London and not necessarily the lowest.
Quality and quantity obviously affect prices—a fact
which should be remembered by those who make use of
this information.

	BRICKS, &c.
	£ s. d.
Hard Stocks	1 10 0 per 1000 alongside, in river.
Rough Stocks	1 6 6 "
Grizzles	2 2 0 "
Facing Stocks	2 2 0 "
Shippers	2 2 0 "
Flettons	1 7 0 "
Red Wire Cuts	1 14 0 "
Best Farnham Red	3 12 0 "
Best Red Pressed	5 0 0 "
Bunton Facing	5 0 0 "
Best Blue Pressed	4 2 6 "
Do. Bullnose	4 7 6 "
Best Stourbridge	4 0 0 "
Fire Bricks	4 0 0 "
GLAZED BRICKS.	
Best White and	12 0 0 "
Ivory Glazed	11 0 0 "
Stretchers	16 0 0 "
Quoins, Bullnose,	16 0 0 "
and Flats	16 0 0 "
Double Stretchers	16 0 0 "
Double Headers	16 0 0 "
One Side and two	19 0 0 "
Ends	19 0 0 "
Two Sides and	20 0 0 "
One End	20 0 0 "
Spalls, Cham-	20 0 0 "
ferred, Squinta	20 0 0 "
Best Dipped Salt	13 0 0 "
Glazed Stretch-	14 0 0 "
ers, and Headers	14 0 0 "
Quoins, Bullnose,	14 0 0 "
and Flats	14 0 0 "
Double Stretchers	14 0 0 "
Double Headers	14 0 0 "
One Side and two	15 0 0 "
Ends	15 0 0 "
Two Sides and	15 0 0 "
One End	15 0 0 "
Spalls, Cham-	14 0 0 "
ferred, Squinta	14 0 0 "
Second Quality	14 0 0 "
White and	14 0 0 "
Dipped Salt	14 0 0 "
Glazed	14 0 0 "
	less than best.

BRICKS, &c. (continued).

Thames and Pit Sand	8 d.
Thames Ballast	27 p. per yard, delivered.
Best Portland Cement	27 0 per ton, "
Best Ground Blue Lias Lime 30 0 ..	"
NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.	
Grey Stone Lime	12s. 6d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 6d. per ton at riv. dep.	
STONE.	
BATH STONE—delivered on road wag- ons, Paddington Depot	1 6s. per ft. cube.
Do. do. delivered on road wagons, Nine Elms Depot	1 4s. "
PORTLAND STONE (20 ft. average)— Brown Whitbed, delivered on road wagons, Paddington Depot	1 4s. "
White Basebed, delivered on road wagons, Paddington Depot	1 4s. "
Red Mansfield, delivered on road wagons, Paddington Depot	2 4s. "
Ancaster in blocks	
Beor	1 11 p. per ft. cube, delivery dep.
Gravel	1 10 "
Darley Dale in blocks	2 4 "
Red Corsehill	2 4 "
Cloveland-Frostons	2 4 "
Red Mansfield	2 4 "
YORK STONE—Robin Hood quality.	
Scrapped random blocks 2 10 ..	"
6 in. sawn two sides	2 10 "
landings do sizes	2 10 "
(under 40 ft. super.) 3 p. ft. super. "	"
6 in. rubbed two sides	2 6 "
ditto, ditto	2 6 "
3 in. sawn two sides	0 11½ "
slabs (random sizes) 0 11½ ..	"
3 in. to 2½ in. sawn one	0 7½ "
side slabs (random	0 7½ "
sizes)	0 7½ "
1½ in. to 1 in. ditto, ditto 0 0 ..	"
HAND YORK.	
Scrapped random blocks 3 0 p. ft. cube.	
6 in. sawn two sides	3 0 p. ft. cube.
landings do sizes	3 0 p. ft. cube.
(under 40 ft. super.) 3 p. ft. super. "	"
6 in. rubbed two sides	3 0 "
ditto	3 0 "
3 in. sawn two sides	1 2 "
slabs (random sizes) 1 2 ..	"
3 in. self-faced random	0 5 "
slabs	0 5 "
Hopton Wood (Hard Bed) in blocks 3 3 p. ft. cube.	
6 in. sawn both	2 7 p. ft. cube.
landings 2 7 p. ft. cube.	
3 in. do. 1 4s. "	"
SLATES.	
in. in.	2 p. d.
20 x 10 best blue Bangor 13 2 p. per 1000 of 1200 s. d.	
20 x 12	13 17 6 "
20 x 10 first quality	13 0 0 "
20 x 12	13 15 0 "
20 x 10	7 5 0 "
20 x 10 best blue Port- madoc	12 12 6 "
16 x 8	6 13 6 "
20 x 10 best Bucks un- fading green	15 17 6 "
20 x 12	13 5 0 "
16 x 8	10 5 0 "
20 x 10 permanent green 11 12 6 ..	"
18 x 10	12 6 0 "
16 x 8	6 13 6 "
TILES.	
Best plain red roofing tiles	3 7 p. per 1000 at riv. dep.
Do. and Valley tiles	3 7 p. per 1000 "
Best Broseley tiles	5 0 p. per 1000 "
Do. Ornamental tiles	5 0 p. per 1000 "
Hip and Valley tiles	4 0 p. per 1000 "
Best Bunton red, brown, &c. brindled do. (Edwards) 57 6 p. per 1000 ..	
Do. Ornamental do	6 0 p. per 1000 "
Hip tiles	3 0 p. per 1000 "
Best Red or Mottled Stafford- shire do. (Peake)	51 9 p. per 1000 "
Do. Ornamental do	54 6 p. per 1000 "
Hip tiles	4 1 p. per 1000 "
Valley tiles	8 8 p. per 1000 "
Best "Rosemary" brand	48 0 p. per 1000 "
Do. Ornamental tiles	50 0 p. per 1000 "
Hip tiles	4 0 p. per 1000 "
Best "Harrow" brand	4 0 p. per 1000 "
Valley tiles	4 0 p. per 1000 "
Best "Harrow" brand	4 0 p. per 1000 "
plan tiles, sand faced	50 0 p. per 1000 "
Do. pressed	50 0 p. per 1000 "
Do. Ornamental do	50 0 p. per 1000 "
Hip tiles	4 1 p. per 1000 "
Valley tiles	3 6 p. per 1000 "
WOOD.	
Building Wood	At per stan. load.
Deals, best 3 in. by 11 in. and 4 in. 8 s. 6 d. ..	
Do. do. 11 in. by 11 in.	13 0 0 "
Deals: best 3 by 8	13 0 0 "
Battens: best 3½ in. by 7 in. and 3 in. by 6 in. ..	10 0 0 "
8 in. by 7 in. and 8 in. by 6 in. ..	10 0 0 "
Battens: best 2½ by 8 and 3 by 7 ..	10 0 0 "
Deals: seconds	1 0 0 "
Battens: seconds	9 0 0 "
2 in. by 4 in. and 2 in. by 3 in. ..	8 0 0 "
2 in. by 4 in. and 2 in. by 3 in. ..	8 0 0 "
Foreign Sawn Boards	0 12 6 more than 1 in. and 1½ in. by 7 in. "
2 in. by 4 in. and 2 in. by 3 in. ..	1 0 0 "

COMPETITIONS AND CONTRACTS.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Damages to be Delivered.
*Plans for Schools	Derbyshire Education Committee.	Not stated	May 1

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Pump House, Quay Walls, etc., at Generating Station	Belfast Tramways, etc., Committee	City Surveyor's Office, Town Hall, Belfast	April 21
Villa Residence, Regent-street, Kingswood	Dr. C. J. Perrott	J. MacKay, Architect and Surveyor, Regent-st., Kingswood, Bristol	do.
Sewage Pumping Plant	Haverhill U.D.C.	F. W. Knewstubb, Engr. & Sur., Council Offices, Haverhill, Suffolk	do.
1,200 tons of White Metal	Wishaw Town Council	W. Rodger, Borough Surveyor, Wishaw	April 25
District Library, Pollokshields	Glasgow Corporation	Office of Public Works, 84, Cochrane-street, Glasgow	do.
Constructing Road (Victoria-avenue)	Manchester Paving Committee	City Surveyor's Office, Town Hall, Manchester	do.
Girder Bridge over Wansbeck at Low Angerton	Morpeth R.D.C.	J. M. MacGregor, District Surveyor, 14, Market-place, Morpeth	do.
Masonry Bridge over River Ront at Shelly	do.	do.	do.
Granite, Limestone, and Dress	Hunslet R.D.C.	W. B. Pinder, Clerk, Glashouse-street, Hunslet, Leeds	do.
Entrance Gates and Boundary Wall, West Norwood	Lambeth Guardians	Clerk to Guardians, Brook-street, Epsomington-road, S.E.	April 29
Road Works, Station-road, Long Benton	Tynemouth R.D.C.	A. S. Dinning, 21, Ellison-place, Newcastle-on-Tyne	do.
300 lineal yds. of 9-in. Pipe Sewer	Cardiff Corporation	Steward's Office at Infirmary	do.
Boundary Walls, etc., at Engineer's Institute, Park-pl.	Burslem Corporation	F. Bettany, Borough Engineer, Municipal Offices, Burslem	do.
Cellaring under the Shambles	West Derby Guardians	C. C. Doig, Architect, Elgin	do.
Warehouse, Knockando Distillery	North Berwick Town Council	A. D. Wallace, Town Clerk, North Berwick	do.
Painting at Infirmary, Mill-road, Liverpool	King's Norton & Northfield U.D.C.	J. F. Moore, Secretary, Education Offices, King's Norton, Bham	do.
120 tons of Purifying Lime	Rochdale General Purposes Com.	S. S. Platt, Borough Surveyor, Town Hall, Rochdale	do.
Council School, Tiverton-road, Selly Oak	South Stoneham R.D.C.	W. J. Potter, Dis. Surv., "Gloucey," Portsway, Southampton	do.
403 lineal yds. of Wrought-iron Fencing	do.	do.	do.
Flints	Justices, etc., Sewers, Gravesend, etc.	E. L. Baker, Clerk to Commissioners, The Precinct, Rochester	do.
Cherting Gravel, etc.	Marple U.D.C.	J. R. Mackenzie, Gas Engineer, Marple Bridges, near Stockport	do.
Rag and Block Stone	Swinton and Pendlebury U.D.C.	H. Eatwile, Council Offices, Swinton, near Manchester	do.
Plant and Appliances	Hampton U.D.C.	S. H. Chambers, Surveyor, Public Offices, Hampton, Middlesex	April 27
Conversion of Gasholder Tank into Tan, etc., Tank.	West Riding Education Committee	J. Vickers Edwards, County Architect, County Hall, Wakefield	do.
Filtering Material, Slack Brook Sewage Works	do.	do.	do.
Collecting House Refuse	do.	do.	do.
Closets, etc., and Aspha., Cridding Stubbs Prov. Sch.	Warrington Paving Committee	T. Longdon, Borough Engineer, Town Hall, Warrington	do.
Six New Classrooms, Thunesson Provided Schools	Sale U.D.C.	W. Holt, Surveyor, Council Offices, Sale	do.
Asphalting Playgrounds, Swinton Roman-ter. School	Wellington U.D.C.	J. T. Parker, Clerk, 29, Church-street, Wellington	do.
Drainage, Swinton Roman-terrace School	Edinburgh & District Water Trustees	W. A. Tait, C.E., 72a, George-street, Edinburgh	do.
Forming and Paving Streets and Passages	Gateshead Corporation	N. P. Pattinson, Borough Engineer, Town Hall, Gateshead	do.
Brick Boundary Wall, Dane-road	Glasgow Corporation	D. McCall, 38, Cochrane-street, Glasgow	do.
Limestone Asphalting of Footpaths	Wimbledon U.D.C.	H. Tomlinson-Lee, Electricity Works, Darnley-rd., Wimbledon	do.
6,000 tons of Filtering Sand, Alnwick-hill	Consett Iron Co.	C. E. Oliver, General Offices, Consett	do.
Paving Streets	Tredgar Junction No. 3 Bldg. Club	A. A. Griffiths, Architect, Pontifranth, Mon.	do.
Stores, Police Department	Hull Corporation	W. A. White, City Engineer, Town Hall, Hull	do.
15-ton Overhead Hand Travelling Crane	Gildersome U.D.C.	H. B. James, Clerk, Council Offices, Gildersome	do.
Culinary Offices, Chappell	Manchester Parks Committee	City Architect, Town Hall, Manchester	do.
Twenty-nine Houses at Pontifranth and Tredgar	Dunblane Town Council	D. T. Reid, Town Clerk, Dunblane	April 29
Street Works, Bankside, etc.	Bournemouth Corporation	Lacey, Sillar, & Leigh, 2, Queen Anne's-gate, Westminster, S.W.	do.
565 tons of Broken Leicester Granite	Kingston-on-Thames Corporation	Borough Surveyor's Office, Municipal Offices, Kingston-on-Thames	do.
Conveniences, Brookdale Park	Mr. E. A. Gray	T. Kershaw, Architect & Surveyor, L. & Y. Bank-chmrs., Halifax	do.
Cement Pavements, Footpaths, and Kerbs	Great Driffield U.D.C.	J. Forrest, Architect and Surveyor, Forres	do.
Feeder Cables, etc. (Christch. Tramways, Contract 5)	Glasgow Corporation	J. Charles & Sons, 28, Albion-street, Leeds	do.
Eleven Electric Cans (Contract 3)	do.	G. B. Tonge, Clerk, Great Driffield	do.
Painting, etc., of Town Hall and Assize Courts	Torquay Town Council	Office of Public Works, City-chambers, 84, Cochrane-st., Glasgow	do.
Two Dwelling-houses, Ivo House-lane, Luddenden	Barry U.D.C.	J. B. Sutherland, Water Engineer, 45, John-street, Glasgow	do.
Business Premises and Dwelling-ho., High-st., Forres	New Sarum Town Council	S. C. Chapman, Water Engineer, Torquay	do.
Four Villas, Headingley	Redruth Public Rooms Co., Ltd.	G. A. Birkenhead, Architect, Caledonian-chambers, Cardiff	do.
1,800 tons of Unbroken Whinstone	Bradford Education Committee	J. Wills & Sons, Architects, Derby	do.
Jobbing Work	do.	City Surveyor, Endless-street, Municipal Offices, Salisbury	do.
Paving Work	do.	H. W. Collins, Architect, Clifton-road, Redruth	do.
Stores, Water Department	do.	J. T. Brown, 97, West Regent-street, Glasgow	do.
1,000 tons of Portland Cement	do.	Education Offices, Manor-row, Bradford (Architect's Department)	do.
Girls' School for 398, High-street, Barry	do.	V. G. Litton, Engr., Tramways Engrs' Office, Fratton, Portsmouth	do.
Baptist Church, Doncaster	do.	W. Lloyd Marks, Surveyor, 61, High-street, Rhymney	do.
Griffin's-court Improvements	do.	do.	do.
Additions, etc., Druid's Hall, Redruth	do.	do.	do.
Scavenging, Cambuslang	do.	do.	do.
Furniture for Art School	do.	do.	do.
Taking Down, Re-erect, Iron Building, Westfield, Wyke	do.	do.	do.
Annual Contracts	do.	do.	do.
Paving, Kerbing, Channeling	do.	do.	do.
2,500 tons of Broken Limestone	do.	do.	do.
Sewerage Extension, Aberystwyth	do.	do.	do.
Street Improvements, Smawthorne-grove, etc.	do.	do.	do.
Private Street Improvement Works	do.	do.	do.
Painting, etc., at Collindale Asylum, Hendon	do.	do.	do.
Construction of Wincobank-avenue and Foxglove-road	do.	do.	do.
Making Silverdale-street	do.	do.	do.
Waterworks, Tates Works, Walsingham	do.	do.	do.
Steel Curved Girder Bridge	do.	do.	do.
Steel Material	do.	do.	do.
Miscellaneous Tools	do.	do.	do.
Alkers, etc., of Infirmary, Wards, Withington Work	do.	do.	do.
600 tons of Flints	do.	do.	do.
*Repairs to Roads at Downs School Station	do.	do.	do.
*Painting, etc., Works, Herne Bay and Witham	do.	do.	do.
*Large Haker-room at Fever Hospital, Woolwich	do.	do.	do.
Stores	do.	do.	do.
Sewage Works at Ellesmere Port	do.	do.	do.
Making-up Station-road and Whitelands-crescent	do.	do.	do.
Bridge over Longnor Brook	do.	do.	do.
*Supply of Deals and Matched Boarding	do.	do.	do.
Additions, etc., Royal Cornwall Salubrious Home	do.	do.	do.
Hospital	do.	do.	do.
Petrol-Driven Railway Motor Coach	do.	do.	do.
Water-Tube Boilers	do.	do.	do.

NEWBURY.—For pulling down and re-building premises in Cheap-street, for the Governors of St. Bartholomew's Hospital and Grammar School. Mr. W. H. Bell, architect, the Market-place, Newbury:—
H. W. Godwin £1,910 0 0
Kingerlee & Sons £1,387 0 0
A. J. Chivers 1,340 7 0
A. Brazier,
G. Head 1,451 10 0
Found-st.,
Elms & Sons 1,453 11 6
Newbury*. 1,238 0 0

NEWTON ABBOT.—For the construction of a covered reservoir at Dunley (Chudleigh Knighton water supply), and supplying cast-iron pipes, etc., for the Rural District Council. Mr. S. C. Chapman, Engineer, Torquay:—
T. Donney .. £1,376 16 10
Mardon & Pearson .. 1,249 0 0
Winston 1,945 5 0
Blackler .. 1,227 0 0
Pearse 921 6 2
J. Ford 1,139 4 10
T. Shaddock 1,058 15 8
E. Pike 898 11 8
F. A. Stacey 1,065 0 0
W. T. Steven-son 896 0 0
L. Taylor .. 969 4 6
H. R. Came-ron 908 7 6
Best Teign-
mouth* .. 883 6 0
Devon Trac-
tion and Motor
Co., Ltd., .. 950 1 7

OTHERY (Somerset).—For house and shop for J. Cozens Esq. Mr. J. W. Hill, architect. Quantities supplied:—
Glead Bros. £875
Stookham £590
Fursland 844
Bryer 595
Davis & Son 665
Baker 585
Allen 625
Palmer & Son* 581

SCOPWICK.—For erecting new Wesleyan chapel and school. Mr. J. R. Halkes, architect and surveyor, 11, Mint-street, Lincoln:—
B. Crookes £777 16 7
R. L. Holland,
Halkes Bros. .. 729 0 0
West Parade,
W. & M. Halkes 710 15 0
Lincoln* £840 10 0
Saxby 675 0 0

SELBY OAK.—For street improvements, Bedy-ley-road, for the King's Norton and Northfield Urban District Council. Mr. A. W. Cross, Surveyor, 23, Valentine-road, King's Heath:—
G. Tretham, 38, John Bright-street,
Birmingham £117 18 8

SUNBURY-ON-THAMES.—For making-up Rook-wood-road, for the Urban District Council. Mr. H. F. Coates, Surveyor, Council Offices, Sunbury. Quantities by Surveyor:—
Hoffman £420 14 0
T. Free & Sons £293 18 0
C. Mott 364 1 0
A. C. Soan 292 18 5
T. Adams .. 327 0 0
W. Adamson 263 19 5
G. Baldwin .. 322 10 0
G. Heburn,
J. Shelbourne & Co. 309 14 11
Hersham* .. 230 11 6
S. Kavanagh
& Co. 295 1 2

SUTTON.—For oak fencing, with cast-iron posts, at Belmont Asylum, Brighton-road, Sutton, Surrey, for the Metropolitan Asylums Board. Messrs. T. Dinwiddie & Sons, architects, 54, Parliament-street, S.W.:—
J. T. Brooker .. £565 0 0
Rowland Bros. £377 10 0
J. Stenning & Son, Ltd. .. 545 0 0
Saw Mills, Ltd. 368 0 0
M. Marshall .. 544 10 0
Ennes Bros.,
A. Turner & Son 535 13 0
Erith* 342 0 0
J. & B. Legato 437 15 6

SWANSEA.—For constructing new road and sewer from Sketty-road to Windsor-street and beyond, for the Pant-y-Gwydr Estate. Mr. C. H. Jenkins, surveyor, 1, Cambrian-place, Swansea. Quantities by surveyor:—
Bennett Bros. £800 0 0
Griffith Davies,
J. & F. Weaver .. 798 0 0
Paxton-yard,
J. & D. Jones .. 750 0 0
Swansea* £599 0 0
J. Williams 741 12 12
J. Maries & Son 569 0 0

SWANSEA.—For erecting a concrete reservoir at Clasomont, Morriston, and for laying water mains, for the Rural District Council. Mr. T. T. Williams, Engineer and Surveyor, Council Offices, Swansea:—
C. Hanney & Son, Clydach-road, Morriston,
near Swansea* £805

SWANTON NOVERS (Norfolk).—For alterations and additions to Swanton Novers School, for the Norfolk Education Committee. Mr. A. J. Lacey, architect and surveyor, 6, Upper King-street, Norwich:—
Larner, East Dereham £569

SWANSEA.—For pipes for the Cwmrhodydyr water supply works, for the Rural District Council. Mr. T. T. Williams, Surveyor, Alexandra-road, Swansea:—
Seventy-seven tons 4-in. Cast-Iron Pipes.
T. Spittle, Ltd., Newport, Mon.* £4 16 6

WALTHAMSTOW.—For erecting special schools for mentally and physically defective children, to accommodate sixty each, Clifton-avenue, for the Waltham-stow Education Committee. Mr. H. Prosser, Architect to the Committee. Quantities by Mr. G. T. G. Wright, F.S.I., 3, Great Winchester-street, E.C.1:—
W. H. Hyde .. £7,469 0 0
W. J. Maddi-
Turtle & Son £6,054 0 0
Apleton .. 0,930 0 0
F. & E. Davey 5,987 0 0
Martin, Wells,
& Co. 6,750 0 0
A. G. Crisp .. 5,985 0 0
R. & E. Evans 5,782 0 0
Kirk & Randall .. 6,745 0 0
Knight & Son 5,776 0 0
Groves & Sons 6,698 0 0
J. & J. Dean 5,639 0 0
H. C. Horswill 6,839 0 0
Pollard & Sons & Burley 6,635 0 0
Brand 5,544 0 0
A. Faulkner .. 6,200 0 0
W. Manders .. 4,949 10 0
F. J. Coxhead 6,100 0 0

[Referred to the new Education Committee.]
WHITSTABLE.—For enlargement of police station. Mr. F. W. Ruck, County Architect, Maidstone:—
G. H. Denno & Son £2,500
T. W. Porter £2,349
Stroony Building Co., Ltd. 2,500
G. Rowling 2,348
G. E. Wallis & Sons .. 2,468
W. W. Martin 2,301
Amos & Foad 2,280
H. J. Smith 2,398
E. Fuller & Sons .. 2,200
Gann & Co., Whit-
stable* 2,159
Pence & Sons 2,350

WOKINGHAM.—For sewage disposal works, War-grave, for the Rural District Council. Mr. R. Hassard, engineer, 1, Victoria-street, Westminster:—
A. T. Catley, 23, Lloyd-square, W.C.* £890

WOOLWICH.—For forming new areas and carrying out other works to subways and heater rooms at Brook Fever Hospital, Shooter's Hill, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief:—
Knass Bros. £474
E. Wall, 2, Alice-
W. Mills 387
terrace, Garratt-
T. Cole 345
lane, Tooting, S.W.* £241
B. Proctor & Son .. 293

WROXHAM (Norfolk).—For alterations and additions to schools and house, for the Norfolk Education Committee. Mr. A. F. Scott, architect and surveyor, 24, Castle-near, Norwich:—
Scarles Bros., Norwich £644

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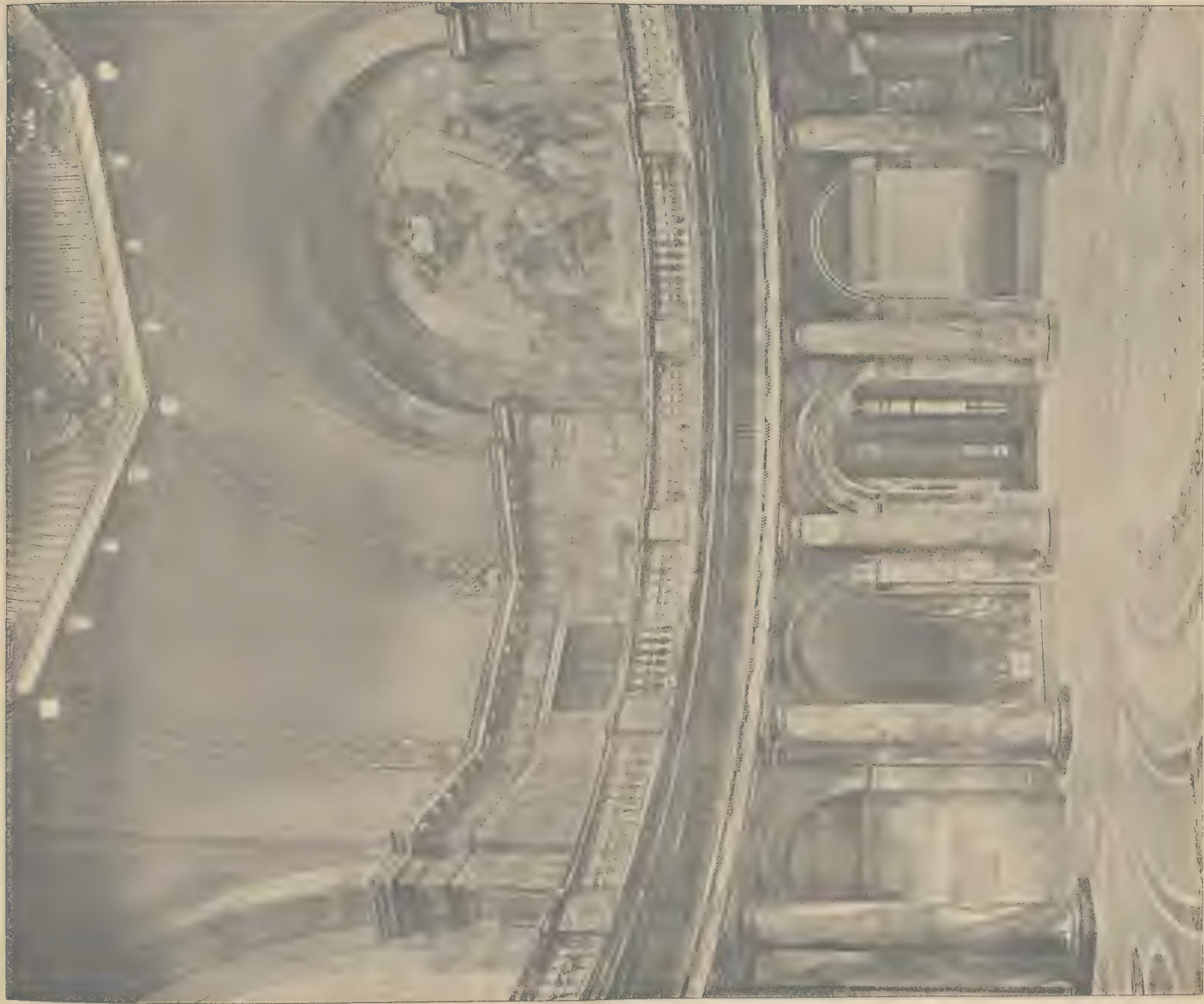
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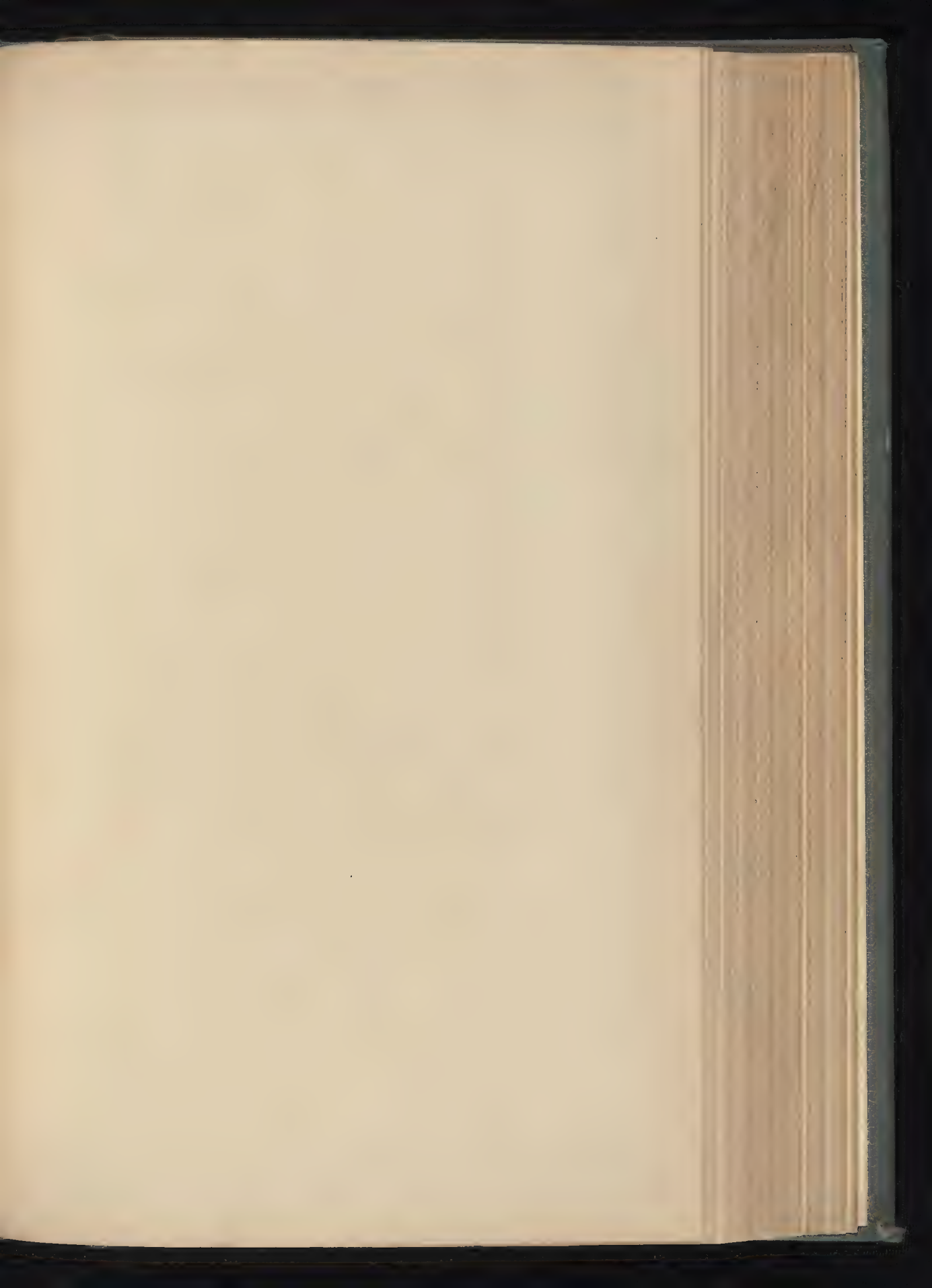
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VIEW IN MEMORIAL HALL, MASSACHUSETTS STATE HOUSE, BOSTON, MASS.—MR. CHARLES BRIGHAM, ARCHITECT.
(From the "American Architect.")

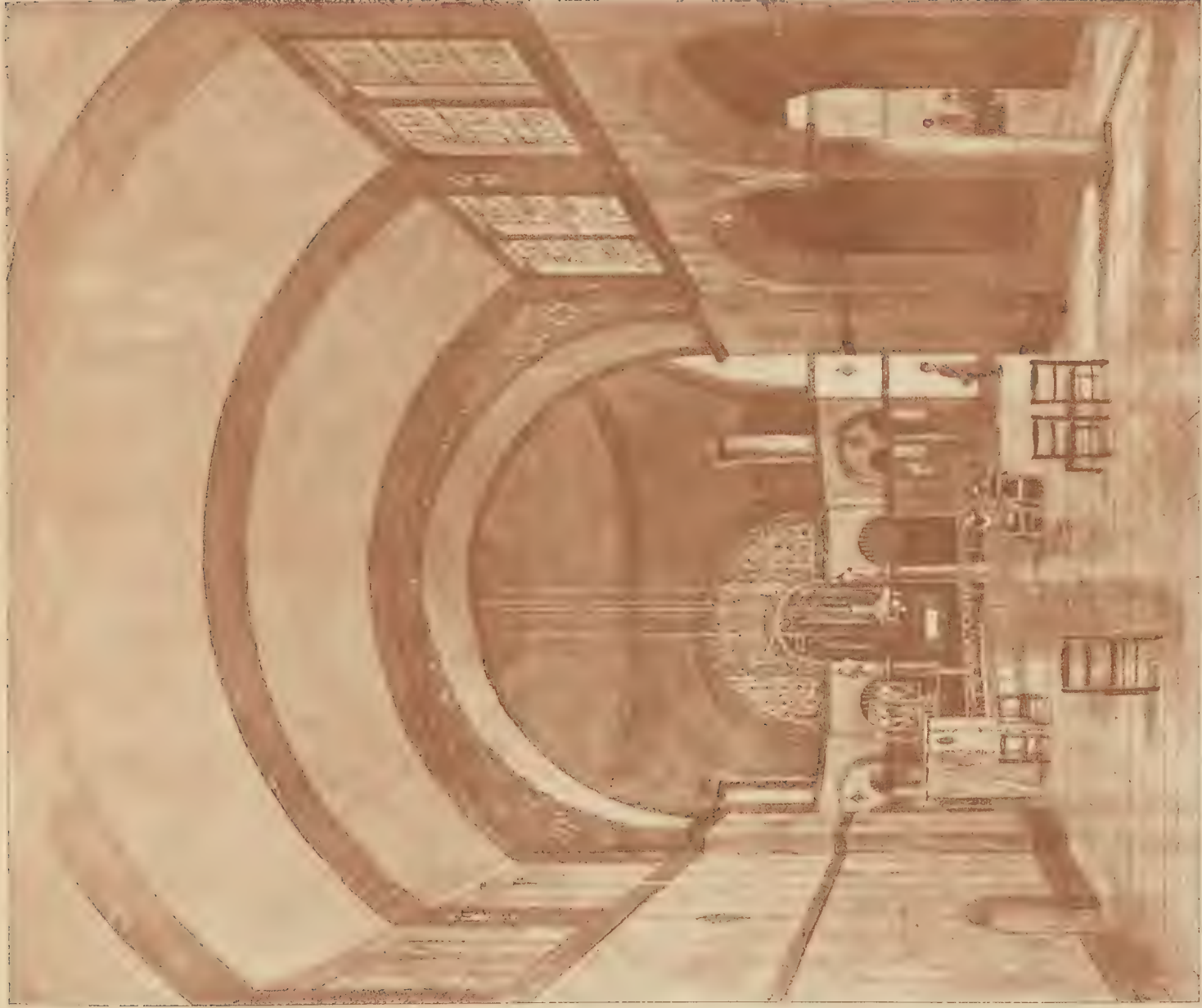


THE BUILDER, APRIL 22, 1905

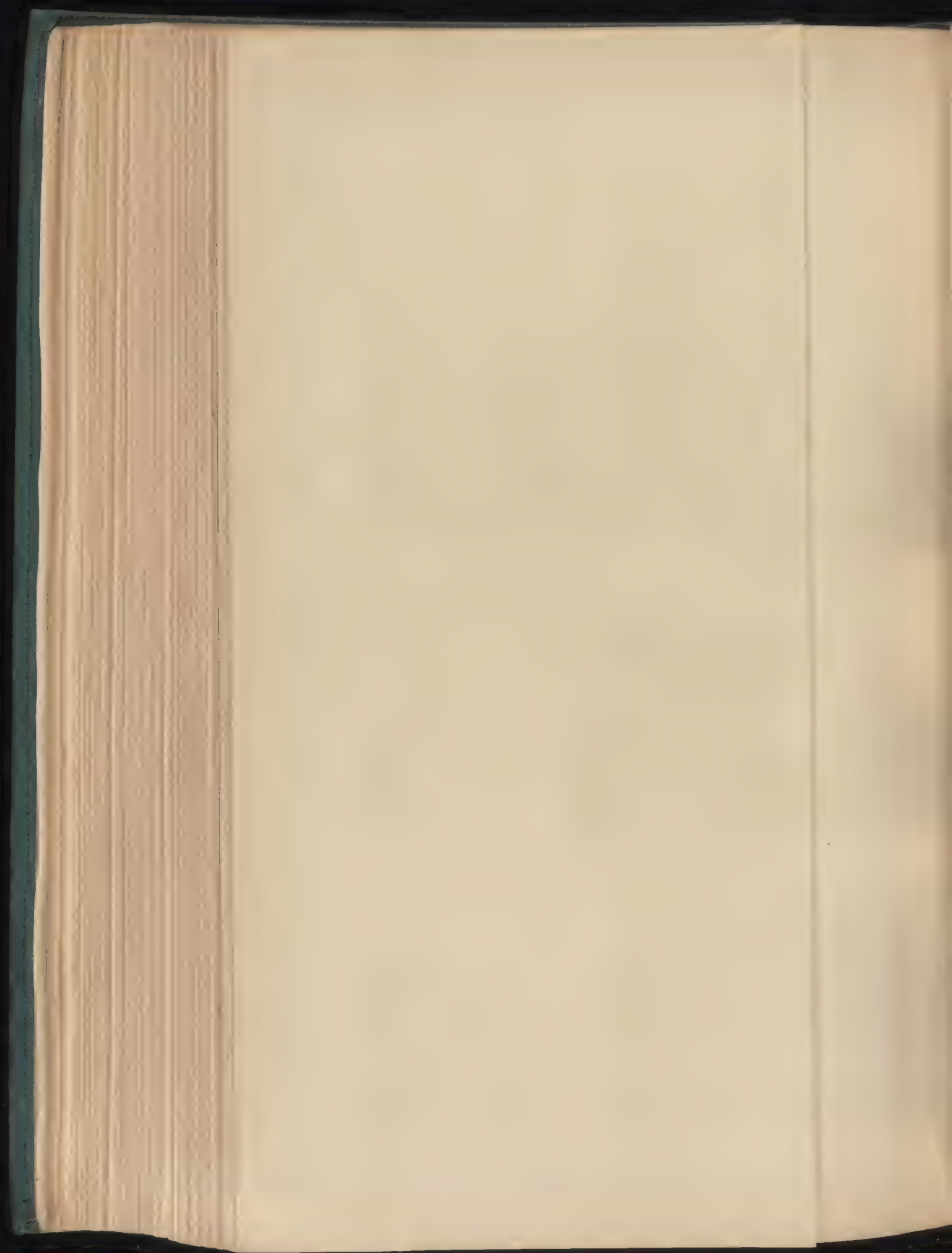




17TH CHAPEL, KING EDWARD VII SANATORIUM, MIDDLESEX. MR. PLACER H. ADAMS, F.R.I.B.A., ARCHITECT.
SOUTH VIEW.



THE CHAPEL, KING EDWARD VII. SANATORIUM, MIDHURST.—MR. PERCY H. ADAMS, F.R.I.B.A., ARCHITECT
INTERIOR VIEW





A



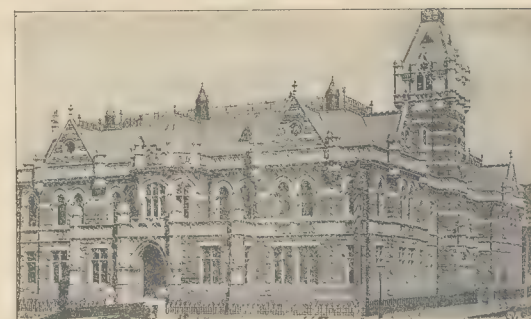
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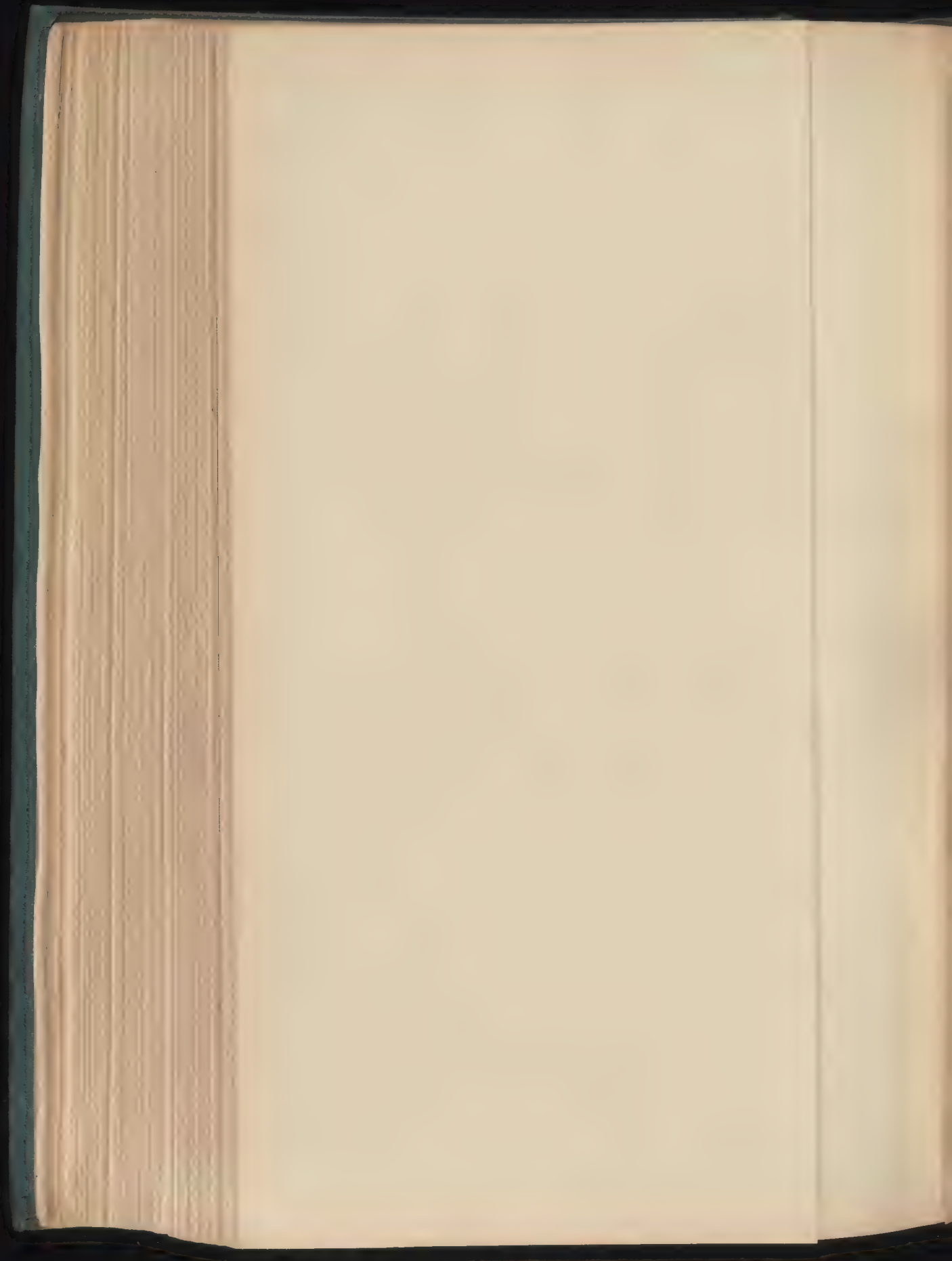
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BUILDINGS IN DUNEDIN, NEW ZEALAND



The Builder.

VOL. LXXXVIII.—No. 3247.

APRIL 29, 1905.

ILLUSTRATIONS.

Proposed New Building at East End of Mall, and Roadway through to Charing Cross	Sir Aston Webb, R.A., Architect.
Proposed House at Reigate House at Bickley, Kent. House at Triscombe, Somerset	Mr. Ernest Newton, Architect.

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Architecture at the Royal Academy.



THE collection of architectural drawings at the Royal Academy seems this year to be an interesting and varied one; more interesting, both as to drawing and design, than the average. Though the works of the first importance that are illustrated are only two, there are a great many good designs of buildings public and private, some which are remarkable also as examples of effective and artistic drawing; and though this, as we have always said, ought to count as only a matter of secondary importance, and has on many occasions been far too much emphasised, it is nevertheless an element of interest.

Sir W. Emerson holds the leading place in the room, with his "Queen Victoria Memorial, Calcutta" (1899 and 1902), which is illustrated in a large perspective drawing, and in a large model standing in front of the drawing, to which a small plan is appended. The plan is unquestionably a very fine one. The whole building forms a great parallelogram with square towers at the outlying angles, nearly detached from the main block and standing out from it. The centre compartment, called "The Queen's Hall," is a circular domed hall, to right and left of which is an open quadrangle flanked on either side by the tower buildings, and closed at the ends

of the building, each way, by a double colonnaded screen forming a segment of a circle on plan; this forms the central feature on the ends of the parallelogram. The main entrances are in the centre of each side; and provision is made for a vista from side to side, across the Queen's Hall, both on the longer and shorter axis. Among the details of the plan the manner in which a special design is given to the Durbar Hall, in one corner of the plan, without interfering with the symmetry of the whole, is a very good architectural point. As to the character of the design, it must always be a debatable question whether, in a building of this importance erected in a foreign country, one should import a style in common use in England, or let the building show the influence of the architecture of the land in which it is built. The Romans had no doubt on that point; they carried out their own style in every country they conquered; but then it was their style, whereas Italian Renaissance, which Sir W. Emerson has adopted, is not ours after all. It is a rather singular chapter in the vicissitudes of things architectural. The Romans derived a style from the Greeks; the Italians of the Renaissance took their style in a modified form from the Romans, and it was adopted by England as by most other European countries; and here it comes round, *videlicet* England, to India, as the symbol of the conquering race. There is something to be said for it; though our own feeling would have been rather in favour of a more Oriental treatment on Oriental soil.

The cupolas of the angle towers are indeed given a bulbous outline derived from the East, but this assorts rather oddly with the Renaissance architecture and the vase finials of the substructure. The moral might be—if you choose to be Renaissance (in such circumstances), be so completely; the classic and Oriental elements will hardly harmonise. In one point there is a certain characteristic treatment suggested by the climate; the upper order is kept well within the roof line, the projecting roof being carried on large cantilevers between the columns, one object in building in India being to keep the sunlight off the walls as much as possible, and make the roof constitute a kind of "solar topee." The interest of the design lies, in short, in the plan and general arrangement rather than in the detail, which is not very interesting; but a building with a plan like that must always have its effect, and it is certainly a grandiose conception as a whole. The drawing is remarkable for the immense pains which have been taken to get a texture in the expanse of blue sky behind the building; but in other respects, though a fine piece of perspective work, it hardly conveys the idea of white marble (which we suppose is the material) under a tropical sun; the lights would be brighter and the shadows more blue than is shown here.

The other work referred to, Sir Aston Webb's proposed screen building across the east end of the Mall and forming the long promised roadway through into Whitehall, is connected with the Queen Victoria Memorial in London, but is not

to be considered as forming a part of it; it is a building which, if erected, will be carried out by the Government out of public funds, and not out of the Victoria Memorial subscriptions. It would, however, form a state entrance or gateway to the Victoria Memorial Avenue. From the illustration, which by the kindness of Sir A. Webb we are able to give in this issue, it will be seen that the architect's original contrivance of the fountain which was to form the meeting point of the two axes, that of the Strand and that of the new road, has been abandoned. As now arranged the difficulty is got over, as will be seen by the plan, by the reversed curves on the two sides of the plan, each of which is arranged so as to be normal to the axis of the approach. This is a very clever piece of work, and may be recommended to the study of young architects. The axis on the Strand side, it will be seen, passes through the Charles I. statue, but the position of the statue and pedestal is obliquely across the line. It might be a question whether it were worth while to turn the monument round so as to stand parallel with the axis and face the gateway, but perhaps it would hardly be right to alter the position it has so long held. As the illustration is there we need not describe the design. It seems exactly the kind of thing that is wanted; in a case like this the use of the columnar order is almost a *sine qua non*, for nothing else will give the dignity and stateliness required in such an erection; and indeed the whole idea of such a state entry or gateway is in itself so essentially Roman that the design would almost naturally fall into a Roman type. The simplicity and severity of line in the whole structure is to be commended. The three panels are to contain inscriptions, but as these had not been officially decided on the panels have been left blank or with merely a partial suggestion of an inscription.

Besides this important design, Sir Aston Webb exhibits drawings of two houses—"Re-modelling of the Manor House, Stoke d'Abernon" (1633), and "Headmaster's House at the Royal Naval College, Dartmouth" (1634). Both perspectives have a plan and a north point, thus setting a good example to the many exhibitors who neglect to give this indispensable information. The first named is a house with a long front and a columned loggia running along the garden side. This block is occupied by a large apartment in the centre, called "saloon," out of which open drawing-room on one side and dining-room on the other; rather an American form of plan. All three get their light from windows looking out into the loggia, which fronts south, so it may be supposed that there is a sufficiency of light. But why does the morning-room face west? Our conception of a morning-room is a room in which to meet the morning sun; it is in the afternoon and evening that the direct sun (in summer) becomes an inconvenience; in the morning, in this country, one is always glad to have it. The Master's House at the Naval College is a picturesque house with the now common but always pleasing incident of wide eaves apparently supported by the bays which run up to them, and which

form parts of the dining-room and drawing-room plan.

Of the other R.A. architects, Mr. Jackson and Mr. Belcher do not exhibit this year. Mr. Bodley has four drawings; two of these (1455 and 1475) are water-colour interiors of two Elizabethan rooms in Powis Castle, both with the addition in the catalogue, "showing alterations"; but as there is nothing, except to those who happen to know the house, to show what is ancient and what is "alteration," the professed purport of the drawings is entirely lacking, the object seems to have been merely to produce a picture of an interior. This is hardly the way to illustrate architectural work. The "Interior of Chapel, St. Chad's, Horninglow" (1539), is a small interior of a chapel with early Gothic detail in the masonry and late Gothic in the screens, etc.; which is taking the best period of masonry (unless we except Norman) and the best period of woodwork together, but it is, from the present-day point of view, very archaeological architecture. The small pencil elevation of "Reredos, St. Edward's Church, Holbeck" (1550), is more to the purpose than any of the others. This is a reredos divided into widely proportioned panels containing sculpture subjects, with very rich tracery canopies over them; a deep and boldly treated open cresting crowns the whole; an excellent piece of work of its kind. Mr. R. T. Blomfield, the new architectural Associate, exhibits two drawings. Of these, "Leasam, Rye, Essex" (1507), has a very interesting plan of house and garden combined, showing how the garden is made to fit into the architectural scheme; the plan of the house consists of two main blocks arranged *en echelon*, only connected near the angles; probably one of these is the residence and the other "service," but the rooms are not named; they should be, as part of the merit of a plan may consist in the way in which the position of and access to special rooms is arranged. The view of the house, in pen line, shows a square brick block with quoins at the angles, a pediment on the surface of the centre portion, and a semi-circular window under it. This kind of architecture certainly does not sin against good taste, as there seems practically to be no architecture in it; but that we suppose is its merit. No one dislikes gew-gaw display in architectural detail more than we do; but it does seem to us that the art of architecture consists of something a little beyond these primary elements of building. Mr. Blomfield's other exhibit, a coloured perspective showing "The New Buildings, Lady Margaret Hall, Oxford" (1599), has more of picturesque interest in the grouping of the red-brick buildings with their stone doorways, and the treatment of the face of the dining-hall and library-block is characteristic. The plan is given, but, as in the other case, without the names of the apartments, except the dining-hall and library over it.

Having considered the exhibits of the Academicians, we may go on to notice some of the designs which represent public buildings or monuments. One of these is the work of a sculptor, Mr. F. E. E. Schenck, and perhaps is a little out of place in the architectural room, though it could not well have been

hung anywhere else; it is sculpture combined with an architectural centre. It is entitled simply "Design for a Monument" (1440), but bears the inscription "Victoria I.," and may be intended for a specific site, though this is not indicated. There is a square podium with a heavy pediment and a bronze figure seated beneath it on each face; above this are two or three steps supporting a smaller block with a cornice, and on each face is a bronze group of figures on a smaller scale than those below; from this rises a massive stele bearing a globe on which stands a figure of Victory. The whole is very well composed, and shows that the sculptor has also a sense of architectural composition.

On each side of the large drawing of the Calcutta Victoria Memorial hangs a very clever and freely executed drawing by Mr. Rickards, in crayon with some touches of colour introduced; as drawings these are among the most effective things in the room. That on the left (1591) shows the interior of the Council Chamber of Deptford Town Hall, by Messrs. Lanchester & Rickards; the wall is plainly treated in pilasters and panels; above this some of the ornament is a little too *rococo* for our taste, but it is effective; the pendant chandeliers are of very picturesque design; in the drawing they seem to fill up the space a little too much, but this may not be the case actually. The other drawing (1605) represents the domed interior of the Council Chamber of the Cardiff Town Hall, by the same architects; the dome is plainly treated with panelling (there is after all hardly any more satisfactory way of treating a domed ceiling than this simple device); in the pendentives are circular windows with boldly treated architraves; a columned recess behind the chair adds to the architectural effect of a very satisfactory interior.

Among other designs of public buildings Messrs. Russell & Cooper send a long perspective view of their "Town Hall and Law Courts, Hull" (1449), a design in which length in the material sense, and breadth in the æsthetic sense, combine to make a remarkable front or rather flank to a very large building. The ground story is perfectly plain rusticated masonry, with plain windows, carrying an order of columns above which is continued the whole length of the building, unbroken except by one centre pavilion with a high deep arch, in the lower part of which is a portico with sculpture above it. This design illustrates very well the effect of continuity of design and severity of unbroken line in a classic building; the tower shows the same severe treatment; a lofty mass of same rusticated masonry, unmarked by any disturbing feature, carries a lantern in two stages the outline of which is not quite pleasing, but it avoids mere pretentiousness and is in keeping with the general treatment of the building. No plan is shown either to this or to Mr. Petch's rather gloomy drawing of "Municipal Building, South Shields" (1480). The very strongly marked rustication of the basement and of the lower portion of the pilasters, in this design, is possibly a little over-done, but it is at all events not commonplace, and the effect of the low arched windows immediately above this

ment carries out the idea of an almost fortress-like solidity which has evidently been the architect's aim. Messrs. Matear & Simon's "Liverpool Cotton Exchange" (1489) has been illustrated in our pages; perhaps the front of a Cotton Exchange has never before put on such a garb of Greek grace and symmetry; the long colonnade with the shadowed recess behind it, in the upper portion of the front, is quite useless, but we have no objection to it on that ground; it is a fine piece of architectural scenery, and suits well with a city of which, in its classic architecture, St. George's Hall may be said to be the key-note. In No. 1498 we come upon a staircase interior, that of the Municipal Buildings, Walsall, by Mr. J. S. Gibson, an effective pencil drawing showing deep side arches springing from architraves carried on coupled marble columns; a very good piece of classic work. Another staircase interior is shown in Messrs. Wills & Anderson's "Hall and Staircase, Sunderland Municipal Buildings" (1566); a rather unusual design shown in a slight washed drawing. Above the first floor gallery the bays are divided by coupled columns; on the ground story the supports are plain square stone piers with bands of darker stone, and a massive unmodelled abacus; the corners of the piers are taken off in a manner not quite clearly indicated in the drawing, but leaving the angles of the abacus projecting; it is a pity that the generally solid effect of the whole is spoiled by the little bit of pendant, a kind of string of foliage, dropped from under the angles of the abacus; a detail quite out of keeping with the rest of the design. The roof is a circular barrel vault with skylights rather crudely cut out of the centre portion.

Mr. H. T. Hare exhibits a water-colour drawing of one corner of his "Public Library, Harrogate" (1545), a piece of classic masonry work of the right type, with sculpture effectively introduced. A centre place is given, and rightly, to the very clever and original design and plan for the double-armed open-air chapel for men and women for the King Edward VII. Sanatorium (1534), by Mr. H. Percy Adams, which was illustrated in our last issue, to which we may refer the reader; but we know that the drawing had been sent to the Academy, we should have held it over till after the exhibition opened. Two other drawings we cannot pass over. Our opening article are Messrs. Nicholson & Corlette's "Design for Liverpool Cathedral" (1580), and Mr. H. Percy Adams's two views of the "New Central Reference Library, Bristol" (1624, 1625). The Liverpool Cathedral drawing is too sketchy in handling, as a drawing, but it is a large and effective view of a remarkable design in which the central feature, probably in part a suggestion from Ely, is novel and striking. It appears to us that there is rather too much of a riot of rich tracery in the windows in contrast with the very broad and solid treatment of the walls and buttresses; it suggests almost the idea that the window tracery had been filled in by a later generation; this of course often did happen in actual mediæval building, with the same somewhat incongruous effect, but there was no need to imitate this result in a modern building designed all at one time. The

drawings for the Bristol Library unfortunately are not accompanied by a plan, they are simply pieces of external architecture, but as such they are most picturesque and original. The general style might be called domestic Gothic, but it is treated in quite an individual fashion in detail; and in the perspective view of "The Front to the Deanery," where we see the building standing on a slope, the whole group, with the picturesquely treated quadrant which connects the two principal blocks, is most interesting from a pictorial point of view. How far this treatment of masses of wall, with windows only sparingly introduced here and there, suits the purposes of the library one cannot of course judge without a plan; but it certainly makes a very interesting piece of architectural composition.

ARTISANS' COTTAGES IN AMERICA.

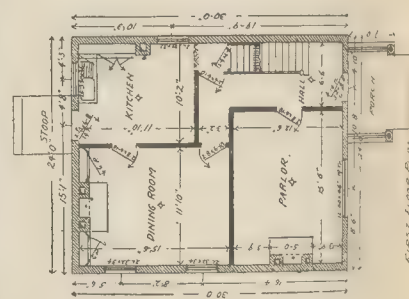
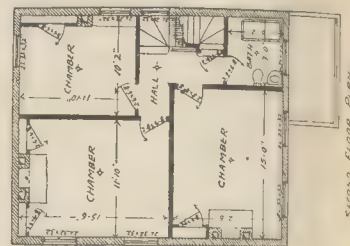
HERE is to be a competition in cottages at Garden City this summer, and the question of the housing of the working classes will be brought into prominence accordingly. Lively interest in the matter is being displayed in the United States as well, but with a difference. Comparison and consequent reflection are made possible by the opportune publication of a long bulletin by the National Bureau of Labor, for it contains a number of plans and illustrations of houses erected for workpeople by their employers. The volume was prepared to represent the operations of the Department at the Louisiana Exhibition. The elevations and views of these workmen's dwellings, which occupy so much space in the book, were selected from a collection of 285 drawings or photographs, furnished by sixteen firms, which made an object lesson even for casual visitors, and an open textbook for commercial men. In this, as with effort in many other directions, what is left with us to individual initiative or business enterprise, is there taken in hand by a staff of official experts, and supported by government appropriations. It is the irony of fate that, while we find our chief interest in cottages through a squabble between a landowner, who is one of His Majesty's judges, and a local authority, they are regarded in the States as one of the ways by which strife between employers and employed may be averted. They rank with profit-sharing, shorter hours, club-rooms and libraries, gymnasias and sick or accident funds, cheap meals and baths, and all the other beneficial measures comprised in the term "Industrial Betterment," as a means of promoting cordiality and fostering goodwill between masters and men.

With such variable factors as locality, land values, and building charges, there can be no exact comparison between houses here and in the States, but a rough conclusion can be arrived at from the particulars appended as to rent and accommodation. But it must be borne in mind that, in most cases, the dwellings are let at rents that are only calculated to cover depreciation, and cannot be taken as ordinary building investments. It may be remembered that the members of the Moseley Commission reported "higher," "much higher," and "very

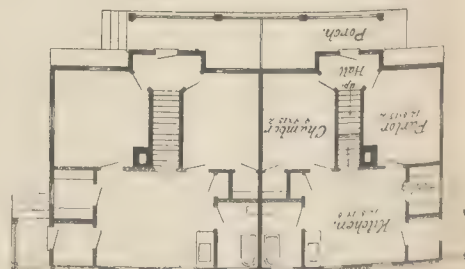
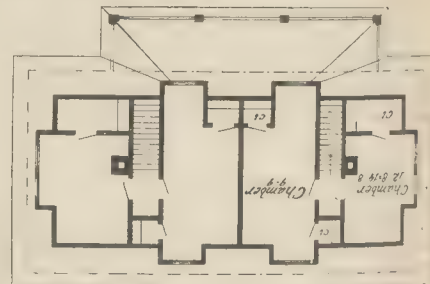
much higher" rents than in this country. There was no difference of opinion upon this point, and where attempts were made to estimate the ratio of increase, the lowest calculation was "about 20 per cent. higher," and so on to "nearly double," "almost as much again," up to "50 to 100 per cent. higher."

There may be differences of opinion about the comparative cost of living on this side of the Atlantic or that, but there seems to be no doubt that the American operative has to pay much more in house rent than his Old World brethren. So far as the illustrations show, it would appear that he obtains good value for his money; but whether, on the whole, and save in such exceptional instances as these, the workers in the States are better housed than those of this country, cannot be well determined.

In the majority of cases the houses are built and owned by the employers. Some few prefer to encourage the men to acquire their own houses through building associations or advances of money payable by instalments, and probably this would be the better, if not the only, plan where a business grew up in an already populated locality. But in setting up a firm on fresh ground the course commonly followed is to build and let suitable dwellings. In one instance it was found that workers did not care to buy houses to which they would be tied. Their "hostages to fortune" did not include a house which might prevent them leaving the place when they wanted to. In another it was the employers who found freeholds objectionable, because a workman-owner on leaving sometimes sold his house to an undesirable successor, who was not inclined to comply with restrictions or requirements insisted upon for the good of the community. The company has in this case since bought back as many cottages as could be obtained. Experience in these respects has only been bought by failure. The liberality of the Westinghouse Air Brake Company turned to its own defeat. After building a number of houses on contract at cash prices they sold them to employees at cost, arranging for repayments by monthly instalments for periods of ten or fifteen years. The terms were too tempting to be refused, but when slack times came unthrifty purchasers failed to keep up their payments. The company now requires money down to the amount of one-fifth of the purchase price, allowing the remainder to stay at 5 per cent., with the expectation of a reduction of the principal each quarter, but without making any stipulation to that effect, so that slack times can be met by a suspension of repayments. Other difficulties have occurred in the kind of houses erected. One firm started with cottages that were better to look at than to live in, and too expensive withal for the class they were intended for. Then tenement houses, some accommodating as many as eight families, were put up. These also proved unsatisfactory, and a fresh start was made with cottages, simply and conveniently constructed, and letting at a comparatively low rent. For several years all new dwellings were built on these lines, but as population increased these occupied more ground than could be



American Artisans' Dwellings.



spared, and a return has been made to blocks of houses as well as suites of rooms over shops. Yet trouble remains, for it is stated that the fashion of the place has set in for detached dwellings, and operatives "demand a cottage."

The housing problem, however, is but part of the more extensive movement towards Industrial Betterment, or Welfare Work, as it is sometimes called. It is significant that not one of the sixteen firms that furnished plans and photographs for this exhibit holds by houses alone in concern for the well-being of its workpeople. There is no need to detail the various measures by which these employers endeavour to lighten toil and brighten leisure, or try to improve the conditions of life all round for workers and their families. These are often determined by local circumstances, or grow out of some other provision made for the uplifting of workpeople. A casualty room set apart in a mill led to the engagement of nurses who care for cases of sickness in the homes of the men. The promotion of physical culture in one instance prompted the making of a skating pond out of a piece of waste ground, and the fact that mill property, in another case, skirted the sea-shore, brought about the building of a parapet wall along the front, to make a beach and promenade, and the erection of two houses for the convenience of bathers of both sexes. Apart from incidental deviations such as these, betterment efforts run upon lines which have already been indicated. In one place or another they touch most of the interest and aspirations of humanity, and it is maintained that they have, according to an official report, "naturally created a better understanding between employers and employed, all other labour conditions being equal, engendering a spirit of amity, resulting in improved workmanship and yielding larger returns on the commercial side of the project." The movement is widespread, and still spreading, in the States. A recent inquiry showed that, in 1903, 108 establishments, employing 59,291 persons, had one or more betterment measures in successful operation in New York State alone. It is being officially fostered as far as possible by gathering and circulating information about it, and it may not improbably have far-reaching consequences.

NOTES.

The Condition of the Parthenon. It appears that at the recent Archaeological Congress at Athens the question was seriously discussed as to raising the fallen columns of the Parthenon which are still *in situ*, though prostrate. M. Kavvadias is in favour of raising them and setting them in their presumable places (it would probably be impossible to ensure that each particular column stood where it formerly did), and we are so far from disagreeing with him that our feeling is rather, why was it not done long ago? The *Times* correspondent quotes Mr. Penrose (with whom he visited the Parthenon shortly before Penrose's death) as against the undertaking, on the ground that we could not do over again the fine work which was necessary in fixing the columns. This seems to be

refining a little too much; with proper instruments it should not be impossible to adjust the drums and the general axis of the columns aright, and it would be easy to keep a memorandum as to which columns had been set up in modern times and which had always remained standing. We should then have certainly a better idea of the perspective effect of the Parthenon than we have now. The question was also raised as to the portion of the original sculpture still remaining on the west front, Professors Dörpfeld and Furtwangler urging that it should be removed to a museum and replaced by casts. We think it would be a pity to repeat the drastic methods of Lord Elgin without the same excuse, the Parthenon being now in good hands and well cared for. At the time of the Elgin raid the sculptures were so brutally abused that only removal could have saved them for the world. But had the Parthenon then been under such good care as it is now, we should have been quite ready to echo Byron's indignation against the spoiler—

"Who snatched the shrinking gods to northern climes abhorred."

Stonehenge. The action brought against Sir Edward Antrobus to establish a public right of way to Stonehenge has failed, judgment having been given last week by Mr. Justice Farwell. From the moment the case was opened it was clear that the evidence was not very strong in favour of the establishing of a definite public way to Stonehenge, since the very nature of the locality gave opportunities for any number of indefinite, and, if we may call them such, technically illegal paths. The Commons Preservation Society has in the past done such invaluable work, and has so judiciously asserted and vindicated public rights that we regret that it should have failed, in this case. From one point of view, however, this failure does not seem so particularly unfortunate. Sir Edward Antrobus preserves his right of property in the site of Stonehenge, unhampered by any public right of way, and he has always been willing to sell the site and ruins for a fixed, though large, sum. It is unlikely that public opinion will ever sanction any acts of destruction by a proprietor of Stonehenge, even if he desired to perform them. Thus there seems to be no reason to fear for the safe preservation of the ruins. If, on the other hand, the action had succeeded, it is not so clear that public right of way to Stonehenge might not have made its preservation more difficult. The practical solution of the matter is the purchase by the nation of the ruins. If a railway has to be made through a piece of land no one thinks any the worse of the proprietor for demanding a high price; and, after all, if a landowner has a unique possession such as Stonehenge, he is not greatly to be blamed if he also should demand a high price for it.

The Madrid Reservoir Disaster. A most serious indictment now lies against the capacity and prudence of the Spanish

Public Works Department, relative to the failure of the partially-constructed reservoir at Madrid. This work, designed as the third reservoir for use in connexion

with the water-supply system of the city, was being built in underground vaults, one of which collapsed without the least warning. The immediate cause appears to have been the bending and rupture of the columns supporting the roof. But there are some very ugly facts in the background. As far back as 1901 a partial collapse took place, and the Minister of Public Works was warned that, owing to the insecure character of the sub-soil, the reservoir would never be able to withstand the pressure of the water intended to be stored in it. Again, in 1903 complaints were made as to the inferior quality of the cement supplied, and about the end of March this year several deep cracks appeared in the masonry. The authorities were at last aroused to some sense of danger, with the result that the construction was subjected to severe tests during the first week of this month. These tests seem to have given the death-blow to the faulty structure, although the Government engineers ignorantly thought they demonstrated its perfect safety. This lamentable occurrence, which has caused the death of more than 200 men, serves incidentally as another reminder of the undesirability and illusory character of heavy test loads.

The Telephone Fires. SOME of the questions which arose at the inquiry into the causes of the two fires which took place simultaneously on the premises of the National Telephone Company on the morning of February 28 are of great public interest. Dr. Waldo performed a public service in submitting some of them to the decision of the jury. It will be remembered that the jury found that the fires were caused by a contact between one of the Company's wires and the conductor-rail of the District Railway Company. Whatever caused this contact, it is obvious that telephone cables should not be allowed near high tension circuits unless properly protected. They also recommend that greater use should be made of incombustible materials in the construction of the test and distributing rooms of telephone exchanges. Special powers are required to regulate all structural and other matters connected with telephone services. They thought that the Oxford-court premises were not satisfactorily provided with means of escape from fire. From the evidence given at the inquiry it appears that the electrical devices used to prevent high tension current getting into the exchange or possibly into consumers' houses were quite inadequate, and on the morning of the fire a telephone user might easily have obtained a most unpleasant shock. The neglect of suitable fuses is the more surprising as we find that very stringent rules on this point are laid down by the insurance companies. Although not directly connected with the inquiry, the question was discussed as to whether it was advisable to use a telephone during a thunder-storm. One of the technical witnesses stated that, in his opinion, although it was very unpleasant it was not dangerous. Sir Homewood Crawford, however, stated that it was dangerous, and that there were cases in which people had received fatal shocks. Personally, we

have known cases of extremely severe shocks being received, and there is always danger in using a telephone connected with outside wires during a thunderstorm.

THE House of Lords, in the case of Brintons, Limited, v. Turvey, have confirmed the Court of Appeal, and held that a man who has contracted anthrax in the course of his employment has sustained personal injury by accident, and is entitled to compensation under the Workmen's Compensation Act. Lord Robertson dissented from this opinion, and Lord Lindley said it must not be taken as involving the doctrine that all diseases caught by workmen in the course of their employment were to be regarded as accidents entitling them to compensation. Where, however, is the line to be drawn? This question is one of such importance that we think the position of employers ought to be clearly defined in the Bill now before Parliament, and upon which we commented in a recent issue. The Departmental Committee, whilst this decision was pending in the House of Lords, considered that it would be premature to amend the definition of the word "accident," but they received very important evidence upon the point, and especially in reference to lead-poisoning, in which disease it was stated that it would be impossible to determine with any certainty how or when it was contracted. The conclusion the Committee arrived at upon this point was that if diseases incidental to the occupation were to be the subject of compensation, it should be under a system of sick insurance, and not a system resting upon personal liability of the employer for an accident, the cause of which must be proved. It is certain that the effect of the above decision will be to cause considerable litigation, raising questions before the arbitrators most difficult for decision, especially having regard to the dictum of Lord Lindley quoted above, and it is to be hoped that some certain solution may be arrived at in the present Bill, since uncertainty on such a point is a hardship to both employer and employed, and raises also difficulties in the way of insurance.

The Proposed Pneumatic Dispatch Service. If sanctioned by Parliament, the pneumatic tube scheme proposed for the metropolis will be of much value, reducing street traffic to no inconsiderable extent, and facilitating the delivery of parcels and letters. The project includes provision for nearly 100 miles of double tube lines, and some 200 stations, distributed so that every district in the county of London will be adequately served. The promoters of the Bill suggest the co-operation of the Post Office, and offer to deliver mails from point to point in the tubes to be devoted to parcels transmission; or, if preferred, to construct a special system of tubes for exclusive use by the department. The experience of several large American cities points clearly to the great advantage of the pneumatic service both for merchandise and for letters. Unfortunately, the Postmaster-General appears to have objections to its introduction on the ground that the profits of the parcels post might be diminished.

It is a thousand pities that our postal system has come to be looked upon as a source of revenue rather than a service for the benefit of the people, and we sincerely hope that Parliament will not be actuated by any dog-in-the-manger policy when dealing with the Bill about to come before their consideration.

A NOTEWORTHY example of the Barossa Dam. concrete construction is presented by the dam built at Barossa, in South Australia, across a river flowing into the Gulf of Gawler, by Mr. A. B. Moncrieff, chief engineer to the South Australian Government. This work, which has recently been completed, is of arched form, and extends from a perpendicular cliff on one side of the river to a sloping bank on the other, projecting as a kind of spur. In plan the outer or upstream curve was struck with a radius of 200 ft., and represents an arc of 470 ft. The cross-section of the dam is approximately a right-angled triangle, the vertical face on the upstream side having a height of 95 ft. above the former level of the river. Owing to the resistance afforded by the curved form of the work, it was not necessary to make the maximum thickness more than 36 ft. at the base and 4 ft. 6 in. at the top. Up to the height of about 80 ft. from the foundation, "plums" of rock were embedded in the concrete, and above that level rows of curved rails connected by fish-plates were added as reinforcement. Thus to a certain extent this dam may be looked upon as an example of concrete-steel construction. Great care was bestowed on the mixing of the concrete, which was made in quantities of 1 cubic yd. at a time, and before deciding upon the proportions of cement, sand, and stone for different parts of the structure, experiments were conducted with the object of determining the resistance of the product to percolation at the calculated water pressures. As a precaution against discontinuity of the work, the beds of concrete were laid so as to break joint horizontally and vertically. In places such as Barossa, where an effective arched dam is possible, the cost of construction is considerably less than for a simple gravity dam. This point is shown by comparing the actual cost, 186,000*l.*, of the Barossa dam with the estimated cost, 230,000*l.*, of a gravity dam on the same site.

The Egyptian Hall and Nos. 166-173, Piccadilly. The demolition is in progress of Nos. 166-173, Piccadilly, a group which includes the Egyptian Hall. Of this building, when it was Bullock's "Liverpool" Museum, and its original surroundings, we published an illustration on January 3, 1903. The house, No. 173, just vacated by Messrs. H. Peat & Co., saddlers, seems to have been built for a private residence; the front has remained unchanged, as it appeared in our view. The Egyptian Hall, next west, was erected in 1812 after designs by P. F. Robinson—the figures of Osiris and Isis, on the façade, being by L. Gahagan—at a cost of 16,000*l.*, for W. Bullock's natural history museum gathered in Central America, and for a portion of the Leverian collection, which were dispersed seven years afterwards. Robinson took most of his details from

the temple of Isis at Denderah; we may presume he was not responsible for the mistake of dividing the elevation into two stories. During the ensuing nearly forty years the Egyptian Hall was used for a succession of shows, exhibitions, panoramas, etc., fifty-three in number, of which we may mention pictures by Haydon and Sir George Hayter; Captain Siborne's model of the Battle of Waterloo (now in the United Service Museum at Whitehall); Dupres-soir's views of Paris, 1835; models of Jerusalem, by Brunetti, and of Venice, 1843-7; and Bonomi's panorama of the Nile, 1850.

Reproduction of Ancient Drawings. The announcement by Mr. Sidney Colvin, in a letter in the *Times* last week, of the formation of a Society for producing reproductions from the drawings of old masters, will be gratifying to all who are interested in art. There are at present numbers of drawings by great artists of the past in existence, buried in portfolios, and known only to their owners and to the few friends to whom it is possible occasionally to show them. To bring these treasures practically to the knowledge and within the possession of art-lovers at large will be a truly good work; for with monochrome drawings the reproductions, with the processes now available, may be considered to be, for study and enjoyment, almost as good as the originals; it is not like the case of photographs of pictures, which can give only the design without the colour. The annual subscription to the Society, which is to be called the Vasari Society, is fixed at the small sum of a guinea, and the Society hope during the first year to issue, for this subscription, a selection of at least twenty drawings in the British Museum, by Leonardo, Titian, Holbein, and others. There ought to be no lack of subscribers for such a good return for their guinea. The Hon. Secretary to the Society is Mr. G. F. Hill, 10, Kensington-mansions, Earl's Court.

THE ROYAL SANITARY INSTITUTE: MEETING IN LIVERPOOL.

A PROVINCIAL sessional meeting of the Royal Sanitary Institute was held on the 15th inst. in the Arts Theatre of the Liverpool University. Sir Francis Sharp Powell, Bart., M.P., Vice-President of the Institute, occupied the chair. Dr. A. A. Mussen, Assistant Medical Officer of Health, acted as local Hon. Secretary. Mr. John Morris, Deputy-Chairman of the Liverpool Housing Committee, formally welcomed the Institute to the city. He said he felt sure that the visitors would find in Liverpool much to interest them in connection with the housing and rehousing question. A great deal had already been accomplished in Liverpool in the direction indicated, and there were still between 8,000 and 9,000 dwellings to deal with.

The Chairman said the last few years had been eventful ones in connexion with the movement to house and elevate the poor, and that satisfactory progress, on the whole, had been made during the period. He was by no means certain that a stage had not been reached at which the history of rehousing when it fell to the duty of the administrator rather than the legislator. If there was to be any progress in the housing of the people, there must be hearty, genuine, and intelligent co-operation between the architect, the physician, and the inhabitant. It was not enough to build the house. The house would be no better in the course of a few years than its present state, except the physician was there with his lessons

science, and the friendly visitor with kindly assistance and intelligent suggestion. It was only by continual vigilance, incessant action, and perseverance that the evil of insanitary conditions could be cured. They would act wisely and judiciously if they continually pressed upon the people the fact that, after all, a duty must devolve upon the inhabitants of the city and the Corporation had to alter the architect and the Corporation had to alter their work. He desired to see the scattering of the population by means of trams and other methods of locomotion, which would prevent that heaping up of the people which, however well the houses might be constructed, was always a source of peril and danger when the population had to be concentrated.

Rehousing.

Mr. Fletcher T. Turton (Deputy Surveyor to the Liverpool Corporation) read a paper upon "Recent Methods of Rehousing Tenants Dispossessed from Insanitary Property." He said that in 1884 it was estimated that 22,000 houses in Liverpool were structurally insanitary. In September, 1902, a street-to-street examination showed that the number of structurally insanitary houses remaining to be dealt with was 2,043, notwithstanding the fact that up to 1904, the Corporation had under a local Act, built with about 8,000 houses, the balance, about 4,000, having been demolished by owners for sites for business purposes. The estimated number of back-to-back houses remaining was 4,000. The death-rate of the areas dealt with averaged about 60 per 1,000 per annum. Although he could not say that the whole of this excessive death-rate was due to the insanitary conditions of the property, the squalor, filth, and poverty of the tenants must account for a great deal. The demolition of so much property naturally caused a great displacement of population, and although private enterprise had built dwelling-houses to the number of between 800 and 900 on sites sold by the Housing Committee for that purpose, and the Corporation had themselves erected St. Martin's cottages, Victoria-square, and Juvenal-dwellings, the number of tenants displaced and who occupied a dwelling-house provided either by private enterprise or the Corporation was infinitesimal. It was not difficult to realise when the rents of the houses provided by private enterprise were, at any rate, generally double those paid by the dispossessed, and those in Corporation dwellings paid in excess of the same rents. The various obligations of the Corporation to rehouse improved work in the shape of building of a huge character, and had resulted in the City Council and the Local Government Board having approved of a scheme for building 1,666 tenements. Mr. Turton gave a detailed description of the new houses erected on the first portion of the Hornby-street area, the newest type of house erected, as well as the latest. The total number of insanitary houses proposed to be acquired was 511, in addition to which there were twenty-three sanitary houses, making a total of 534. The population of the insanitary houses was 2,431. The new dwellings comprised twenty-three blocks, or 445 dwellings, which, it was estimated, would accommodate 2,476 persons. There are fifty four-roomed dwellings, 257 three-roomed dwellings, 125 two-roomed dwellings, and twelve one-roomed dwellings, a keeper's house, seven shops, and a recreation ground containing about 1,755 sq. yds. In the Hornby-street the new dwellings are set back from the present line of street, so that for a considerable portion of the length of this street the width between the main line of the new dwellings will be 70 ft. Each house is provided with a separate sanitary convenience, and also with a separate scullery. The buildings as a whole are three stories in height, each living-room containing at least 150 super. ft., the principal bedroom 125 super. ft., the second bedroom 100 super. ft., and the third bedroom, where one is provided, between 80 and 90 super. ft. The average height of the rooms is 9 ft. clear. The materials used in the construction are local grey brick with red brick dressings, buff terra-cotta being sparingly used and only in the entrances. All the staircases are lined with glazed bricks, the roof-slats, and the floors constructed with small steel joists with coke breeze concrete, the flooring boards being nailed end on to same. The ashes are discharged into bins by means of shoots at the back, and are collected daily by carts. The first portion of the scheme, which has been completed, has involved the demolition of 145 houses. The new dwellings on the site of this

demolished area contain 138 houses, and it is now proposed to proceed with the demolition of a second portion, and the dispossessed tenants from such portion will occupy the dwellings just completed. In this manner it is thought that the whole scheme will be carried out in three portions. The plans for the whole of the scheme had been approved by the Local Government Board, who had allowed eighty years for the repayment of the loan for the purchase of the land, and sixty years for the repayment of the loan for the erection of buildings. The Corporation had had many schemes in hand for housing the working classes, but this was by far the largest attempted. The total cost of the scheme was estimated at 150,000. In all these dwellings the Housing Committee only admitted as tenants those dispossessed by their operations, those that had lived in houses closed under the Housing of the Working Classes Act, 1890, or those who had been living in cellar dwellings also closed. For some years past no tenant had been dispossessed by the operations of the Corporation without having been given an opportunity to occupy one of the new tenements provided. With regard to the poverty of the tenants, he was informed by a guardian of the poor that several thousand families in Liverpool subsisted on an average of less than 10s. per week, and a greater number on less than 15s. per week. A great proportion of these people were at present occupying insanitary houses, and were the class of persons with whom the Corporation had to deal. Sheer poverty and distress in many cases prevented some of the tenants availing themselves of the new accommodation provided. The number of houses at present provided seemed to be somewhat in excess of the demand, but this arose not from the fact that the houses were not popular, but that they were reserved exclusively for those dispossessed. Every one of the dwellings at present vacant could be let five times over if the Committee would only relax their rule; but they had stood firm to their task, finding that as private enterprise could not provide at a reasonable rent for those dispossessed, they (the Corporation) would do so. The total cost of the work of demolition and of the dwellings which had been provided by the Corporation, including Victoria-square and Juvenal-dwellings, was about 789,000, which entailed an annual cost to the rates of about 28,639, after allowing for rents received. This was equal to a rate of about 2d. in the pound. Of this amount he estimated that the loss of providing for the dispossessed amounted to over 6,000, per annum, equal to something less than 3d. in the pound. At the end of the various periods for which the loans for buildings were granted, and which varied from thirty to sixty years, the ratepayers would have a valuable asset in the shape of rent-producing property. On the general results of the work he could speak with great confidence. In conclusion, he replied to a criticism frequently made to the effect that these dwellings were erected too near the heart of the city, and that it would be better to move those dispossessed at once to the outskirts. Those who made remarks of that nature could hardly be aware of the conditions prevailing in the great labour part of the city—namely, the docks. Here the work was practically all casual, and employment very irregular. On the whole many men were only able to obtain work for three days per week; but notwithstanding this they must be constantly in attendance if desirous of obtaining work.

Mr. Joseph Roby (Chairman of the Liverpool Dwellings Sub-Committee) opened a discussion. He considered it was essential that the people should be housed close to their work; a great many people living in insanitary areas were brought up in the town, and would not live in the outskirts or country, even if houses were provided for them there.

Dr. Berry (Wigan) described what had been done by the Wigan authorities.

Dr. W. A. Evans (Medical Officer of Health for Bradford) said he did not know any town except London that had done so much as Liverpool in the way of housing the working classes, and that within about ten years. No scheme of housing was likely to be successful which did not provide accommodation for each and every kind of the inhabitants in the insanitary area itself.

Mr. A. M. Fowler, M.Inst.C.E. (Manchester), advertising to the housing problem in Liverpool, expressed the opinion that when the docks were made land should have been set apart by the Dock Board for dwellings for the working

classes to be employed there. To his mind, he said, it was a disgrace to the dock authorities of Liverpool that they did not provide dwellings somewhere within a convenient distance. He said the large blocks of dwellings, such as those in London and Liverpool, could not be ventilated anything like so well as the back-to-back houses built on the Leeds plan.

Mr. G. Kyffin-Taylor (Liverpool Housing Committee) contributed a paper embodying views similar to those carried out in Liverpool. He, however, was in favour of a number of houses being also provided for some of the working people on the outskirts of the city.

Dr. E. W. Hope (Liverpool Medical Officer of Health) pointed out that the back-to-back houses in Liverpool being demolished were in very narrow streets, and not in wide thoroughfares, such as in Leeds. He said, besides providing dwellings in the town, they must give to the labouring classes who desired it the advantages the better classes wanted for themselves in the way of residence in the more healthy suburban districts.

The proceedings terminated with thanks to the Senate of the University for the use of the Arts Theatre, and to the Chairman.

Later in the afternoon the visitors inspected at the Hornby-street area the most recent work of the Liverpool Housing Committee in the provision of houses for dispossessed tenants.

THE BUILDING TRADES EXHIBITION.

A Building Trades Exhibition was opened at the Royal Agricultural Hall, Islington, on Thursday, and it will remain open until Saturday, May 6. The exhibition was officially opened by Lord Windsor, First Commissioner of Works, before a large audience of visitors and exhibitors.

Lord Windsor said that if any proof were wanted of the undoubted success and usefulness of the Building Trades Exhibition it could not be better found than in the ever-increasing number of exhibitors. He understood that in 1895 there were ninety-two exhibitors, and during the last five exhibitions, which were held biennially the number of exhibitors had steadily and consistently mounted up to the no inconsiderable figure this year of 317. He felt certain that the public would recognise the usefulness and importance of such an exhibition. The increase in the number of exhibitors showed on the one hand that the designers and manufacturers in the industries connected with the building trade found it worth while to place their inventions and improvements before the public; and on the other hand the more complete the exhibition became the more was it worth the while of the visitor that came there, and the better able was he to carry away a mass of useful hints if he was interested in building and the equipment of buildings. One thing he wished to make some reference to was the question of smoke abatement, for he saw there was rather a special section set apart with regard to that. It appeared to him that they had been rather lagging behind in dealing with this great smoke nuisance. It certainly was not only London which was the great transgressor, because they had only to visit the large commercial industrial towns to find hundreds of acres of land where the vegetation had been killed and where the country suffered in consequence of this smoke nuisance. But in London they knew it was hardly bearable when there was a visitation of fog. They saw the trees in the parks dying because of this sooty enemy, and they were driven to the planting of plane and poplar trees, which were the only two of the large forest trees which seemed to flourish in spite of the smoke nuisance. And did not their buildings suffer just as disastrously? How much of the old stone work of London was destroyed by smoke? How many of the old stones which ought to be consecrated by the hand of Time had either become unrecognisable or had had to be displaced by modern restoration. They had fortunately in this country their Portland stone quarries, which provided a stone which seemed to be most suitable for the London atmosphere, and which he ventured to think was also in its white lights and grey shadows perhaps the most beautiful for London. But in spite of this they had to go to their professors of chemistry and ask them to assist in determining how they could preserve the stone work of London. Although cure was a very

stand No. 120, but the exhibits in this hall cannot be noticed until next week. We pass on to the wall-space under the side gallery. The first stand (No. 147) is occupied by the goods of Wilmer & Son; among these we may mention good marble, and iron mantels, Bond's patent gas with sunk hearth (recently described in our columns), enamelled iron baths, and iron cists. The James Keith & Blackman Co. (No. 145) exhibit air-propellers (belt-driven and electric), Keith's sectional heating apparatus, boilers, sectional radiators, etc.; a number of gas-fittings were also shown, fitted with special mantels and capable of producing a light of 300 candle-power at a cost (it is said) of one penny per hour for gas; the gas to be burnt is compressed by a special apparatus driven by water or electricity, and is forced through the small orifice in the burner at a high pressure; the system is in use on London streets and in Covent Garden Market and other places.

Next to it (at No. 142) H. E. Gaze has an excellent exhibit of fibrous plaster decorations, including well-modelled figures larger than life, wood and compo mouldings, etc. J. & R. Light (No. 141) show American lumber of various kinds, and three-ply woods of various kinds for panels, drawer-bottoms, etc.; the middle layer is of whitewood, and the outer layers of birch, oak, or walnut. At 139A, Messrs Robertson & Son (Fleetwood) exhibit a 5-ton steam waggon with hydraulic tipping arrangement.

Parallel to the exhibits just described are the stands in Row F, and in the bays adjacent thereto, the first being that of Partridge & Cooper (No. 100), and consisting of office furniture, vertical and horizontal filing cabinets, desks, chairs, etc. Jones & Roberts exhibit their patent automatic disinfectant for fixing in the flush-pipes of water-closets, and also Fred Jones's new method of fixing the only special fitting being a cast-iron collar or bracket which is fixed to the wall; through this collar the soil-pipe is passed, and the joint is made by taping back the upper end of the pipe on the curved surface of the collar, soldering a copper ring on, and then wiping the upper length of pipe on in the usual way; the collars are fixed as a rule 5 ft. apart, and a joint occurs at the alternate collars; flanges are wiped on at the other collars to give additional support to the pipe. At No. 109 J. & R. Nadin (Burton-on-Trent) display a number of drain-pipes, gullies, traps, etc., of the usual types in good glazed stoneware. The Aston Magna Brick & Tile Co. (Moreton-in-Marsh) show at No. 103 various specimens of their red pressed facing bricks, wire-cut bricks, hand-made roofing tiles (pressed and unpressed), finials, paving quarries, etc. Near this is the exhibit (No. 17) of Adamsez & Adams-Hydralics; this includes some quaint and well-modelled pottery, glazed and unglazed (the glazed in various broken colours), lavatories, urinals, water-closets, etc., and a large straw-glazed slabs for water-closet divisions, so glazed slabs for water-supporting; the closet-slabs are hung to look fixed with screws to the slabs, so that wood or iron frames are not required; the glazed ware is of excellent quality.

G. F. Braggins & Co. (Banbury) show a number of oak gates with adjustable and self-closing hinges and other fittings. R. W. Blackwell & Co. have a large exhibit of "Ruberoid" roofing, damp course, insulating papers, wrought-iron tubes and fittings, malleable and cast-iron fittings for steam, gas, and water pipes, pumps, tools, etc. W. J. Burroughes & Sons have a miscellaneous assortment of American baths, Canadian and American radiators, "Ideal" boilers, Dowsing electric radiators, lavatories, etc. H. W. Cullum & Co. (No. 20) show the "Kulm" fireproof partition slabs of pumice-stone and cement, the horizontal joints being formed with semi-circular tongues and grooves in the same manner as in many other partitions; nails can be driven into the slabs. At the same stand a builder's scaffold is shown, the poles of which are attached with the Bristol Wire Rope Co.'s flexible steel latches instead of the usual ropes and wedges. A third exhibit contains samples of Joseph King & Co.'s (Stourbridge) plain and ornamental terracotta in light and dark grey, light and dark buff, and red, together with pressed and moulded bricks, etc. Matthews & Yates (Swinton) exhibit air-propellers and other apparatus, the most interesting being the "Cyclone" separator for collecting and conveying the sawdust,

shavings, and chips from wood-working machinery, by means of an exhaust fan with tubes leading to it from the various machines. Arthur Koppel (Nos. 22 to 24) has a large display of contractor's steel tipping and other trucks, crane skips, concrete mixer with self-contained petrol motor, water softener (Froitzheim system), etc.

Turning again to Row F, we find, opposite the last-named stand, an exhibit (No. 119) of the Marland stoneware bricks made by the North Devon Clay Co. at their Marland Works (Torrington); the bricks are very hard and of a pale buff colour, and are used for walls, paving, etc. Other bricks are shown, at No. 116, by the Dodsdown Brickworks (Marlborough), including dark red sand-faced bricks and hard wire-outs. At the same stand the Selby Brick Co. (Selby) exhibit glazed faience mantles in dark and light green, mazarin blue, and teapot-brown. No. 115 is the stand of Lyte's Metallic Woven Stair-tread Co. and Banner Sanitation Co.; the stair-tread is of plain steel wire and lead-encased steel wire woven together and then rolled so that the lead is squeezed into the meshes. The Banner Co. exhibit a new automatic flush-tank of novel design, the dome of the siphon being fixed by means of a spur at one end of a pivoted lever, to the other end of which a ball is attached; the water rising in the tank raises this ball and releases the spur; the dome is then suddenly raised by another ball, and the displacement starts the siphon; after the discharge, the spur and dome fall back to their original positions. Another novelty is a very handy drain-testing apparatus (known as the "Inferno") for use with smoke-rockets; it is fitted with an air-pump and indicator, and is in reality a combination of the pneumatic and smoke tests. The Somerset Trading Co. (Bridgwater) show a simple and unobtrusive interlocking roofing tile, known as the "Somerset"; the tiles measure 15½ in. by 8 in., and are fixed without nails, except at the verges; a single thickness is used except at the lap, and the quantity of tiles and weight of roof are, therefore, much less than in the case of ordinary tiles; finials, vases, etc., are also shown. Special mention may be made of the hand-made sand-faced bricks and roofing tiles exhibited by Thos. Pascall & Sons (Wrotham, Kent) at No. 113; there is a good variety of colour, and the texture of the tiles is equal to that of many old tiles. At the next stand there is a pitch-pine block floor laid by the Acme Paving & Flooring Co. on their well-known doweled system. Poyers & Deane Ransomes exhibit instructive examples of compound steel stanchions, girders, roof-principals, and other structural steelwork. J. Rooke (Kettering) shows specimens of Weldon stone, including an old stone from Kirby Hall, Northants, bearing the date MDCXC, and still in perfect preservation. Messer & Thorpe's patent bucket fire-extinguisher (No. 109) has a number of buckets telescoped into each other and submerged in a covered tank, so that each bucket is filled with water as it is lifted out. There was no name or number on the next stand, but the small buff paving-bricks are evidently the well-known Adamantine clinkers made by Towers & Williamson (Grantham). The next exhibit is a self-supporting brick partition with metal ties, made by the Fireproof Partition & Spandrel Wall Co. The Lyle Co. (No. 105) exhibit a number of well-made oak filing cabinets and card-index cabinets, made in sections, so that extra drawers can be added at any time without trouble.

In Row E the exhibit opposite the last is that of Stavers & Stavers (No. 99), and includes a number of screens or porches, doors, etc., which are left unpainted so that the materials and workmanship can be fully seen; more care has been bestowed on the designs than is usually the case in exhibits of this class. Mr Sam Deards (Harlow, Essex) at No. 98 shows a small building covered with his "Superior" glass roofing; the bars are of steel, shaped like an inverted T, with projecting ribs along the ends of the flanges forming condensation channels; they may be enamelled, galvanised, or entirely covered with lead; the glass rests on the projecting ribs, and a lead capping is bent over the web of each bar to a point a little below the soffit of the glass, and turned up again and lapped over the glass at each side; the system has a general resemblance to some other patent glazing systems, but differs a little in some of the details. Carter & Co. (Poole) exhibit at No. 96 specimens of their tiles, faience, ceramic mosaic, terra-cotta, etc.

Near this is the stand of R. Waygood & Co. (special position No. 11), at which are shown a hand dinner-lift with foot-brake, and an electric dinner-lift with push-buttons for starting and stopping, and with special shutters to the hatches, so that the lift stops automatically when any shutter is opened; the gearing for an electric passenger-lift is also shown. Another good exhibit of joinery is that of Samuel Elliott & Sons (Caversham), and includes a large number of balusters, many of which are well designed, oak and deal doors, panelling, mouldings, etc. Fenlon & Son (No. 94) show their gas bath-geysers fitted with a simple interlocking gear so that the gas cannot be turned on before the water or the water turned off before the gas; there is a separate tap for the pilot-light, and also an automatic dual valve; other specialties are gas-heated radiators, and a gas-heated boiler for greenhouses; the boiler itself is placed in the greenhouse, but the door-face projects through the wall, so that the door opens outside. The combined exhibit of the Emdeca Metal Decoration Co. and the British Stamped Metal Co. is an interesting architectural feature; the structural portion by the latter company consists of stamped steel and copper columns and pilasters supporting an entablature with pediments, the mouldings being very true, with sharp arrises; the walls and ceilings are lined internally with Emdeca stamped and enamelled zinc, but nearly all the designs are imitations of tiling, with sham joints. Near this is the small building erected by the British Comptoboard Co. (special position No. 5), showing the application of comptoboard to walls and ceilings. Special position No. 4, near the last, is occupied by glazed bricks and hearth-curbs, sanitary ware, buff paving bricks and tiles and engineering bricks, fireclay fuel-linings, terra-cotta, etc., made by Candy & Co. (Newton Abbot). H. J. & C. Major (Bridgwater) at No. 92 exhibit their special interlocking roofing tiles, and also ordinary plain red tiles, ridges, finials, malt-kiln tiles, bricks, etc. A small porch with walls of white gault pressed facing bricks (plain and moulded) and roof of plum-coloured tiles has been built at No. 90 by the Aylesford Pottery Co. (Maidstone). The Nostell Brick and Tile Works (Wakefield) exhibit at 88A a selection of their dark brownish-red bricks and tiles, finials, ridges, chimney-pots, etc.; the goods are hard and well burnt. Colthurst, Symons, & Co. (Bridgwater) show a variety of roof-tiles, including their patent interlocking and "Paragon" tiles, and also pressed plain tiles, together with ridges, finials, copings, bricks, etc. Near this is the building erected by Fred Jones & Co. at special position No. 8 to show the "Hercules" partition blocks, coke-breeze concrete blocks, and composite blocks; the ceiling and "signboards" are of fibrous plaster, and various methods of applying silicate cotton will also be shown. Sissons Bros. & Co. (Hull) have erected a small and quaintly designed room for the purpose of displaying their Hall's washable distemper and "Sisco" white japan. The distemper tints are very pleasing, and special attention should be drawn to the canvas friezes painted in distemper; that inside the room has a conventional design of trees and flowers, and that outside represents a landscape at sunset, with distant mountains; the foreground and river are somewhat weak, but the general effect is good. The next stand (No. 86) displays red pressed facings and cherry-red sand stocks, ranging in thickness down to 1½ in., made by G. Tucker & Son (Loughborough). Other bricks, roofing tiles, etc., are shown by Watson Nelson (Napton-on-the-Hill, Warwickshire). At No. 84 there is a comprehensive exhibit of the Atlas artificial stone made by the Atlas Stone Co. (Cambridge); it includes balustrades in cream and red, an excellent flight of geometrical stairs, paving slabs, terrazzo paving, glass mosaic, etc. R. & E. Collier (Reading) have a large display of their roofing tiles, finials, etc., the most interesting to us being the hand-made sand-faced tiles, some of which are stained to give the broken colouring of old tiles; pressed and coloured bricks made of lime and sand are also shown, and are true and hard; among other things we may also mention their chimney pots, flower-vases, and pottery.

Among other exhibits of particular interest to architects and builders are those of the Ames Crosta Sanitary Engineering Co., the Columbian Fireproofing Co., J. A. King & Co., the Crittall Manufacturing Co., Art Pavements and Decorations, Diespeker, F. McNeill &

Co., the Gilmour Door Co., J. P. White, the New Expanded Metal Co.; G. M. Callender & Co., Dawson & Co., but these cannot be noticed in detail until next week.

SOME AMERICAN CRANES.

THE Cleveland Crane and Car Company, of Wickliffe, Ohio, send us circulars—described as bulletins—of their cranes for various purposes. Bulletin "G" gives particulars of jib, post, and car cranes for use in machine shops, foundries, and on outdoor service, where work can be conducted within the range of the jib radius. Hand, steam, compressed air, water, or electricity can be applied as motive power on any or all of the motions. The framework of these types of crane is built of rolled steel sections or plate girder work. The top and bottom pivots are of steel rotating in roller bearings, the bottom pivot being provided with a step-bearing of bronze and steel. The "Armington" electric hoists are built by the same firm to meet the demand for a power hoist occupying very little space, but capable of handling large loads with ease and rapidity. These hoists, as well as the cranes mentioned above, are provided with automatic safety brakes, and, so far as we are able to judge from the illustrations and descriptive matter, all of them seem to be well designed and strongly built.

CONCRETE BUILDING BLOCKS.

A NEW industry which has sprung up in the United States is the manufacture of concrete blocks for building purposes in place of brick and stone. When concrete began to be generally used for wall construction, the erection and subsequent removal of falseworks was found to be so expensive an item that the idea was developed of moulding the concrete into blocks, suitable for laying in the same way as bricks or blocks of stone. Then followed the further development of making the blocks hollow to reduce their cost and weight, and to render the walls drier and warmer. So rapidly has the industry grown that to-day numerous firms in all parts of the United States are engaged in the production of the new form of building material. The demand is so great and the profits are so alluring that many who have rushed into the business are inadequately equipped with the plant and practical knowledge necessary to insure success, and it is, unfortunately, the case that large quantities of very inferior material are being placed upon the market. The average purchaser cannot tell whether the blocks have been properly made, whether the raw materials were in accordance with standard requirements, or whether the correct proportions of cement and gravel were adopted by the maker. Hence a good many builders prefer to make the blocks

themselves, either on the site of the building to be erected or in their works, as may be the more convenient.

At the present time there is no definite standard for the guidance of blockmakers as to the composition of the concrete used, the proportions adopted varying from four parts up to ten parts of ballast to one part of cement. As a matter of fact, the proportion of ballast should never be more than four parts to one part of cement for solid blocks. The sand ought to be separated from the stones, and the correct proportion afterwards added, so that the cement and sand may fill the voids between the stones. Mixing should be performed by an approved machine, and moulding by a machine specially made for the purpose.

One of the most important details of manufacture is the seasoning of the blocks, for however carefully a block may be made it will be practically worthless if not properly seasoned. The first requisite in this process is plenty of water. The interval that should elapse after the block has been turned out and the commencement of sprinkling must depend upon atmospheric conditions, and may vary between three hours and eight hours. A good general rule is to apply water as soon as the colour of the outer surface begins to assume a lighter shade, and the blocks should be sprinkled afterwards as often as this effect is observed. After the blocks have been stacked in tiers, they should be sprayed with water from a hose for about a week.

Buildings of all kinds are now being erected of concrete blocks in almost every town and village throughout the United States, and in some cases with satisfactory effect from the aesthetic standpoint. In the case of a church recently built entirely of concrete blocks, a dark rock cement was used, giving a rich bluish-grey surface, closely resembling that of the local sandstone, and from which it could scarcely be distinguished. Some cements are certainly not calculated to make blocks of particularly pleasing colour, but by using a suitable facing material a fine smooth surface can be given, and, if all the blocks be made with cement of uniform shade, the general effect will be very similar to that of any ordinary building stone.

In America a great advantage offered by the blocks is that they are much cheaper than brick, stone, or timber, and, as they are far lighter in weight than cut stone, and considerably larger than bricks, the cost of laying is comparatively small. We do not suggest the cost of production in this country could be reduced sufficiently to offer any advantage in the ordinary way in respect of price over brick masonry, but there might be a saving in buildings of massive character, and the strength of the construction would be largely augmented. One important point is that most American fire offices are already quoting lower rates of

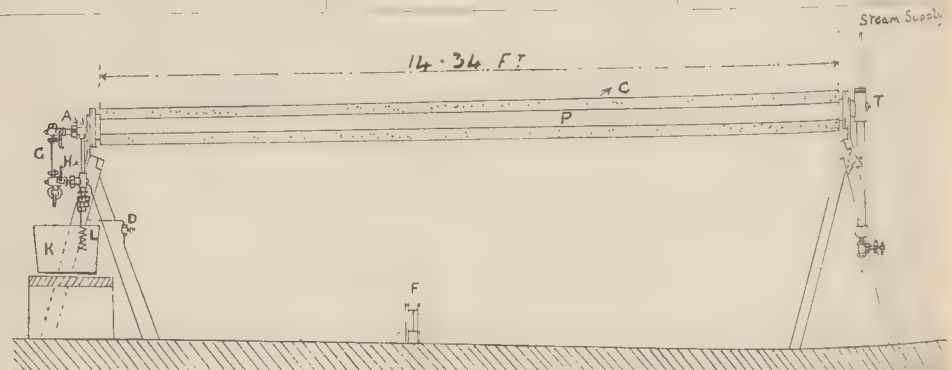
insurance for concrete block buildings than for those of any other type. In Great Britain we are tolerably familiar with cement blocks applied to the building of piers, breakwaters, and other engineering structures, and the new system is certainly worth the attention of architects.

TESTS OF STEAM-PIPE COVERING.

SINCE the classical experiments of Peclet, recorded in his "Traité de la Chaleur," many tests have been made upon coverings of various kinds for steam pipes, some in this country, but more at various universities and colleges of the United States. A recent test of the "Wadnit" asbestos pipe covering is interesting as exemplifying the valuable facilities now afforded to the public by the National Physical Laboratory, and the results may be of service to steam users, although, of course, they do not in any way indicate the comparative value of the particular type of material examined.

The arrangement of the testing apparatus employed is shown in the accompanying diagram. The test pipe (P) was of steel, 4.47 in. external diam. and 14.34 ft. long, with flanges at the ends, and having a total radiation surface of 16.85 sq. ft. It was supported in a nearly horizontal position, with a slope of 6 in. in the length, to provide for the flow of condensed steam to the collecting pipe (H). The covering (C) is shown in section above and below the pipe. Steam was admitted through a separator (S) into the upper end of the test pipe, and the temperature of the steam was taken by means of the thermometer (T). Water of condensation in the collecting pipe was kept at a constant level during the experiments by observation of the gauge (G) and adjustment of the drain cock (D), the water being blown out through a coil (L) passing through the cooling tank (K) to prevent re-evaporation on reduction to atmospheric pressure. The figure also shows an air cock (A) at the lower end of the pipe. To permit correction to be made for the loss of heat from the flanges and auxiliary pipes, two flanges (F) similar to those on the pipe were fitted, after completion of the pipe tests, between the two ends of the apparatus in place of the test pipe. In this way the condensation due to the flanges and ends of the apparatus was determined separately. The observations made related to (1) the temperature of the steam, (2) the temperature of the outside of the covering, (3) the temperature of the air, and (4) the weight of the steam condensed.

The weight of water collected multiplied by the number of British thermal units representing the latent heat at the recorded temperature gave the total loss of heat from the pipe in B.Th.U. Deducting from this quantity the total heat lost through the flanges and ends, the net loss from the pipe itself was obtained.



Apparatus for Testing Steam-Pipe Coverings.

REFERENCES

P—Test pipe.
C—Covering.
G—Water gauge.
T—Thermometer.

S—Separator.
A—Air cock.
F—Flanges to replace pipe when measuring condensation in ends.

H—Collecting pipe.
D—Drain.
L—Cooling coil.
K—Cooling tank.

DIMENSIONS:—

Length of pipe, 14.34 ft.

Diameter of pipe, 4.47 in.

Surface of pipe, 16.85 sq. ft.



Old Board of Trade Buildings, Whitehall (removed to make way for Soane's Building).

This net loss divided by the latent heat gives the condensation in pounds in the test pipe alone. The covering was in flat sections, about 3 ft. by 2 ft., which were wrapped round the pipe and laced with copper wire. The mean thickness of cover was 1.53 in., its weight being 3.0 lb. per ft. run, or 1.7 lb. per sq. ft. of external pipe surface. For the purpose of comparison, a test was also made with the bare pipe. The following are the principal results as certified by Dr. Glazebrook, Director of the National Physical Laboratory:—

RECORD OF OBSERVATIONS.		
	Covered Pipe.	Bare Pipe.
1 Temperature of Steam	393.4 deg. F.	392.7 deg. F.
2 Temperature of Cover	103.6 deg. F.	
3 Temperature of Air...	64.0 deg. F.	67.7 deg. F.
4 Steam condensed per hour	6.245 lb.	30.42 lb.

CALCULATED RESULTS.		
	Covered Pipe.	Bare Pipe.
Steam Pressure (gauge)	215 lb. per sq. in.	213 lb. per sq. in.
Latent Heat	837 B.Th.U. per lb.	837 B.Th.U. per lb.
Difference of Temperature (Steam and Air)	329.4 deg. F.	325 deg. F.
Total Loss of Heat	5,225 B.Th.U. per hour.	25,550 B.Th.U. per hour.
Loss Due to Flanges and Ends	2,245 " "	2,170 " "
Net Loss Due to Pipe	2,980 " "	23,380 " "
Condensation from Pipe	3.56 lb. per hour.	27.9 lb. per hour.
Condensation from Pipe per sq. ft.	0.212 " "	1.60 " "
Loss per sq. ft. per deg., Difference of Temperature	0.64 B.Th.U. per hour.	4.27 B.Th.U. per hour.

From the foregoing results the following table has been prepared by Dr. Glazebrook, the air temperature of 70 deg. Fahr. being assumed:—

HEAT LOSS AND CONDENSATION IN BARE AND COVERED PIPE OF 4-IN. INTERNAL DIAMETER. AIR TEMPERATURE=70 DEG. FAHR.				
Steam Pressure (gauge).	Loss in B.Th.U. per sq. ft. per hour.		Steam Condensed per sq. ft. per hour.	
	Covered.	Bare.	Covered.	Bare.
150	168.4	1,330	0.200	1.59
200	170.6	1,357	0.203	1.61
220	172.7	1,373	0.206	1.64
230	174.6	1,389	0.209	1.66

This table shows that the saving due to the pipe covering in question should be equal to 87 per cent. of the total condensation taking

place in an unprotected pipe. While the results are clear as to the usefulness of this particular material, we should now like to hear of tests under the same conditions upon the numerous other types of pipe covering in daily use. In connexion with this subject we notice that some very similar trials were made a short time ago for the purpose of a thesis by two students at the Iowa State College, U.S.A., and the data then obtained are more useful because the investigation was made with steam at pressures ranging from 20 lb. to 100 lb. per sq. in., upon nine different makes of non-conducting material, including asbestos air cell, asbestos sponge, and 85 per cent. magnesia coverings. The condensation for various pressures in the unprotected pipe was: 20 lb., 398 B.Th.U.; 40 lb., 480 B.Th.U.; 60 lb., 565 B.Th.U.; 80 lb., 624 B.Th.U.; and 100 lb., 678 B.Th.U. We have calculated these figures for ready comparison with those given by Dr. Glazebrook. It is interesting to note that the

OLD BOARD OF TRADE BUILDINGS, WHITEHALL. THESE are the buildings which stood on the site now occupied by the Treasury Buildings, on the west side of Whitehall. They were removed to make way for the block of building designed by Sir John Soane, and subsequently altered to its present design by Barry.

ARCHITECTURAL SOCIETIES. GLASGOW INSTITUTE OF ARCHITECTS.—The annual general meeting of the Glasgow Institute of Architects was held on the 18th inst. in the rooms of the Institute, at 187, Pitt-street, Mr. John Keppie, President, in the chair. The annual report stated that the number on the honorary roll was eight, and the number on the ordinary roll seventy-one. It was resolved to give the Institute prizes in future as follows:— 3l. 3s. for the best general work and attendance; 2l. 2s. for the best work in measuring class, Technical College; 2l. 2s. for the best work in drawing class of School of Art. The tenth triennial competition for the Alexander Thomson travelling studentship will be held this year, and the drawings are to be lodged with the Secretary by December 28, 1905. The report was adopted, and the Council for the ensuing year was elected as follows:— Messrs. A. N. Paterson, John Keppie, Horatio K. Bromhead, James Lindsay, T. L. Watson, James M. Monro, Alexander McGibbon, A. Balfour, Charles Gourlay, Thomas Baird, jun., R. D. Sandilands, James K. Hunter, J. M. Crawford, George Bell, Alexander Skirving, and David Barclay. The Treasurer's accounts, which were submitted and approved of, showed that the funds were in a satisfactory position. A meeting of the newly-elected Council followed, at which office-bearers for the year were appointed, viz.:—President, Mr. John Keppie, F.R.I.B.A.; Vice-President, Mr. James M. Monro; Auditor, Mr. David Barclay, F.R.I.B.A.; Secretary and Treasurer, Mr. C. J. MacLean. The various committees for the year were also appointed. EDINBURGH ARCHITECTURAL ASSOCIATION.—This Association paid a visit on the 22nd inst. to Drum House, Gilmerton, permission for which had been granted by Colonel More Nisbett. Mr. Hamilton More Nisbett, architect, acted as leader of the party, and explained the work of the elder Adam. It was built about 1724, and was an early example of fully developed Palladian style in Scotland. The grandeur of the front, compared with the meanness of the other elevations, was characteristic

saving of steam in the protected pipe ranged from 76 per cent. to 89.5 per cent. for the nine coverings tested, the average saving being nearly 82 per cent.

COX & CO.'S BANK, CHARING CROSS.—Mr. H. Ling is appointed architect for the additions about to be made to the banking-house at Charing Cross, at an estimated cost of some 2,000l. The premises, No. 15, Charing Cross, were designed by Ewan Christian for Messrs. Cox & Co., who removed thither from Craig's court seventeen years ago.

PROPOSED ZOOLOGICAL GARDEN FOR ABERDEEN.—A scheme for a small zoological garden and aquarium for the suitable accommodation of the animals and birds at present housed in Duthie Park is under consideration in the Links and Parks Committee of the Town Council of Aberdeen. The City Architect, Mr. Rust, has been instructed to bring up a report and plan embodying the suggestions made by Professor Thomson.

of the time. Attention was drawn to the stone detail of the front elevation, the leadwork, which was rare in Scotland, and the interior plaster work executed by Italians. At the conclusion of the visit Mr. H. O. Tarbolton, President of the Association, proposed a hearty vote of thanks to Colonel More Nisbett and to Mr. Hamilton More Nisbett.

OLD "QUEEN'S TREASURY," WHITEHALL.

THIS is a curious bit of old Whitehall, drawn from a sketch made by Mr. W. E. Drummond-Milliken. It is rather strange to think that



River Front of "Queen's Treasury," Whitehall: formerly the Beer Buttery with Watergate. Pulled down in 1884.

such a building was standing within the precincts of Whitehall only twenty years ago.

ENGINEERING SOCIETIES.

THE INSTITUTION OF CIVIL ENGINEERS.—At the Annual General Meeting of the Institution of Civil Engineers, held on Tuesday, the 18th inst., Sir Guilford Molesworth, President, in the chair, the result of the ballot for the election of officers was declared as follows:—President, Sir Alexander Binnie; Vice-Presidents, Dr. Alexander B. Kennedy, Mr. W. R. Galbraith, Mr. William Matthews, C.M.G., and Sir Leader Williams; other members of council, Colonel W. P. Anderson (Ottawa, Canada), Mr. C. Napier Bell (Wellington, New Zealand), Mr. B. Hall Blyth (Edinburgh), Mr. C. A. Breerton, Mr. R. Elliott-Cooper, Colonel E. E. B. Crompton, C.B., Mr. W. J. Cudworth (York), Dr. G. F. Deacon, Dr. F. Elgar, Mr. Maurice Fitzmaurice, C.M.G., Mr. R. A. Hadfield (Sheffield), Mr. G. H. Hill, Mr. C. W. Hodson, C.S.I., Mr. J. C. Inglis, Mr. G. R. Jebb, Sir William Thomas Lewis, Bart. (Aberdare), Mr. A. G. Lyster (Liverpool), Sir Charles Metcalfe, Bart. (Cape Town), Sir Andrew Noble, Bart., K.C.B. (Newcastle-on-Tyne), the Hon. Charles A. Parsons, C.B. (Wylam-on-Tyne), Mr. A. Ross, Mr. A. Siemens, Mr. J. Strain (Glasgow), Sir John I. Thornycroft, Professor W. C. Unwin, B.Sc., Mr. A. F. Yarrow. The Council have made the following awards for papers read and discussed before the Institution during the past session:—Telford gold medals to Lord Brassey, K.C.B., and Mr. C. S. R. Palmer; a George Stephenson gold medal to Mr. Lionel E. Clark; a Watt gold medal to Mr. J. F. C. Snell; Telford premiums to Messrs. L. F. Vernon-Harcourt, M.A., R. W. Allen, and William Marriott; a Crampton prize to Mr. A. Wood-Hill; and the Manby premium to Mr. E. D. Pain. The presentation of these awards, together with those for papers which have not been subject to discussion and will be announced later, will take place at the inaugural meeting of next session.

THE CARNEGIE TRUST, DUNFERMLINE.—In their first annual report the trustees state that the bonds transferred to the Trust by Mr. Carnegie in November, 1903, have yielded a first twelve months' income of 21,812l. The trustees intend to erect an art gallery and museum, and to provide a central and branch libraries. The baths and gymnasium will shortly be ready for use, and a part of the interior of the house at Pittencrieff is now adapted as a "shelter" from cold or inclement weather.

Books.

Specifications in Detail. By FRANK W. MACEY. London: Crosby Lockwood & Son. 1904.

THE hope expressed in our review of the first appearance of this book has not been realised in the new edition, which now lies before us, in spite of the revision and enlargement claimed for it in the terse preface. Like other spheres of human activity, building methods are in a state of constant change, and during the six years' interval in the two issues of this publication much progress has been made in all matters concerning builders' operations. But "Specifications in Detail" remains very much where it was—that is to say, is now in fundamental respects "out of date." Nor are the "Constructional and Practical" sides of the subject kept in view in the diagrams and descriptions which go to make up this large and important work.

Like some other kindred text books, this volume appears to be largely based upon previous literature. A work of this importance, dealing with the specifying of current materials and methods, should team with the feeling that it is written directly from actual buildings and processes. The character of the illustrations does more perhaps than the descriptive text to convey this idea of backwardness. It is only possible now to give a few references to the many instances where we consider revision necessary. In the drainage of a stable horse pots are shown and specified, and iron surface channels have brief reference, but no mention is made of channels in the actual flooring, and the word *granolithic* is not to be found in any of the 620 pages.

Hollow walls are indicated in a manner which would render such precautions against dampness futile in every way, and the whole reference is too brief. The illustrations are copious, and, as such, should be complete, but in many cases damp courses are not shown in walls, bonding stones omitted from new ashlar facing to old walls, the rolls of lead flats shown parallel with joists instead of with boarding, and wasteful substance in the panels of internal panelling is indicated. The diagrams of heating systems are antiquated, coils being everywhere described, and fittings such as radiators and sectional boilers are almost entirely absent. Metal lathing, amongst other current systems, finds no place in the work, rough cast is dismissed in a few words, and, what is of great importance to present-day constructors, ferro-concrete and its use has no reference whatever.

A great deal is expected of the architect, who is to inspect all framing of timber, and direct where and when all plant and materials are to be deposited or removed. The contractor, again, is required to do impossible things in estimating for items "not specifically mentioned in detail." There is much that is unnecessary and much that deserves greater detail, though we may be grateful for special reminders in regard to matters sometimes overlooked. Many clauses appear to belong to the conditions of contract, whilst others would be better if left to the bill of quantities, but, taken as a whole, there is, as we remarked in our notice of the first edition, much that is excellent and useful to the architect, but of this second edition we regret that no material advance is made in a work for which there is a demand.

Le Abitazioni Popolari. (Case Operaie.) EFFREN MAGRINI. Milano: Ulrico, Hoepli. 1905.

THIS small volume treats of the housing of the working classes; it is divided into two parts, theoretical and practical. The first part discusses the requirements of artisan dwellings, and the second part shows what has been done to meet these requirements. To an English reader the interest centres in the first part rather than in the second; for the plans are defective and the elevations uninspired. The book opens with an historical account which points out that the movement began in

France, though England was the first country to legislate on the subject. As early as 1764 St. Gobain (which now owns 1,500 dwellings) started building cottages for its workpeople, but it was not till 1894, 130 years later, that the State gave its attention to this question. On the other hand, our Parliament took up the subject in 1851, and we had ten years start over the Belgians. Denmark and Brazil were the next to follow suit, while Austria, France, and Germany delayed their legislation till the nineties. The recently constituted Italian State has had so much to occupy it that it waited till May 31, 1903, to pass its first law relating to workmen's dwellings, building societies, etc., though such societies had previously existed.

The Società di Assicurazione Popolare-Vita instituted an inquiry as to the desirability of erecting artisans' dwellings in towns; and the tabulated results form interesting reading. Out of 105 reports, nearly one-half declare that workmen's houses are urgently needed. Of ten answers in the negative three come from towns where co-operative building societies already exist; three from small towns where many dwellings can be had at low rents; two from medieval cities whose population has greatly diminished, viz., Mantua and Pistoia; while two lucky little towns of 5,000 inhabitants have had dwellings built for them by the employers of labour, i.e., the contractors for the Simplon tunnel at Domodossola, and the local wool manufacturer at Borgosesia. This table gives also the yearly rent per room, the cost of building per room, and the price of ground per square metre. Rent varies from 1l. in towns of 5,000 inhabitants to 5l. in Naples with its 500,000 inhabitants. Building ranges from 20l. to 40l. per room in small towns; and land costs from 6d. to 8s. per square metre, except in the old capital cities. Under these conditions, it is considered that building societies are certain to pay.

The second or practical part is less interesting, because to us, less instructive; though two points call for our most careful attention. The first is the categorical statement that 5 to 10 per cent. of dwellings should have at least four bedrooms, to provide for families with more than six or eight children. No stress has been laid on the second point, and this is one that English architects should take especially to heart, i.e., the provision of cellars and store-rooms. We quite realise the fact that a labourer with a family should have not less than three bedrooms; but which of us thinks of arranging for an apple-store in the roof—and who would have the courage to give a cellar to a tiny cottage? We may smile at the primitiveness of the plans (collected from all countries), where generally only two bedrooms are provided—as likely as not one giving access to the other; but the ever-present "cellar" or "store," remind us that our standard of comfort is not the only one. It is interesting to see how many foreign manufacturers provide for their workmen, notably the gun dwellings for their workmen, and we are sorry that not one of our industrial villages is represented. This is the more to be regretted as, out of 180 illustrations drawn from many sources, two English plans are the only ones which show any skill in their arrangement.

Risistenza dei Materiali e Abilità di Costruzioni. Ing. DR. GIULIO SANDRINELLI. Milano: Ulrico Hoepli. 1905.

THIS little handbook, dealing with resistance of materials and stability of structures, is an enlarged and carefully revised edition of the manual of the same title compiled by the late Pietro Gallizia.

Dr. Sandrinelli has endeavoured to eliminate from the older publication all extraneous matter, and to present original arguments in a clearer and more practical form. He has further condensed material produced by numerous other authors, and added a judicious selection of fresh matter in order to bring the publication up to date. The author recognises that the principal characteristic of science lies in its ever enriching itself with new elements, which result from a more exact comparison of fundamental principles.

Consequently this manual deals with much matter that scientists have recently added to the theory of elasticity, in its application to the resistance of materials. The book also contains a large number of tables, useful in practice, and carefully drawn to scale.

logarithms, natural sines, square and cube roots, comparative weight and strength of materials, etc. These are easily referred to, and readily furnish data for the various and rapid calculations needful in practice. Altogether, the book, though not so complete as some of our pocket manuals, should answer its purpose, and provide a concise and practical guide for those engineers and architects who are fortunate enough to work on the decimal system.

Great Masters in Painting and Sculpture: Gaudenzio Ferrari. By ETHEL HALSEY. London: George Bell & Sons. 1904.

In this volume of the "Great Masters" series Miss Halsey gives a very interesting account of the life and work of Ferrari, the "acknowledged head of the Lombard school" in the early part of the XVIth century. Ferrari's fame has suffered on account of an appreciable deterioration in the work of his later years, most of which is to be found in Milan, where the masterpieces of other painters, more especially Leonardo da Vinci, completely eclipse any product of his brush. But in the quaint old-world towns of Lombardy—Vercelli, Varallo, or Novara—his art reigns. Here, indeed, are to be found his finest pictures, all at once deeply religious and intensely dramatic. Miss Halsey rightly insists on Ferrari's dramatic sense and "feeling for reality," for it is undoubtedly due to these qualities that his work contains so much that is delicately beautiful, so much that is supremely Italian.

In her preface the author makes mention of a German element to be found in Lombardy, and in Ferrari's art, and in the second chapter of the book she draws attention to the various influences which were brought to bear upon him. These are important, for although Ferrari nowhere fails to stamp his individuality upon his work, yet it is not difficult to distinguish the various phases through which he passed, together with their precise significance. Primarily an outcome of the old Milanese school, he afterwards threw off its yoke, only, however, to succumb later to the not wholly beneficial effects of the Renaissance. His first master and friend, Luini, whilst undoubtedly Italian in characteristics, "seems to have used his influence in directing his young pupil's attention chiefly to the works of Borgognone and Bramantino," masters of whom the former most probably introduced into Italy Flemish or German ideas—"a certain northern temperature," as Peter suggests—and Ferrari even in his later years shows that he has not forgotten early lessons. So in his great fresco in the church of Santa Maria delle Grazie at Varallo there are traces of a desire for a solidity almost barbaric, certainly not Italian. As Miss Halsey says in a detailed account of this work, "He employs gesso for the armour and trappings, but his love of modelling makes him occasionally exaggerate its use, as in the picture of the Crucifixion, and his happiest results are in the scenes where paint is the only medium used." This use of gesso to raise part of the picture is essentially northern in its origin. Yet there is nothing of this in such a picture as the "Madonna and Child" in the church of San Cristoforo at Vercelli, one of Ferrari's most beautiful works, where the "scheme of light and shade is distinctly Correggio's." If Luini's influence on the whole was one of restraint, Correggio's served to give an effect of confusion, and it may be that this largely brought about the decadence of Ferrari's last years, when "his touch coarsens, his colour scheme becomes crude and fiery, and the movement of his figures violent and exaggerated." Leonardo da Vinci's influence is slight except in isolated instances, such as the "Last Supper" in the sacristy of the cathedral of Novara.

Such works as the altar-piece in the church of San Gaudenzio, a Pietà now in a private gallery in Milan, and the "Journey to Calvary" at Canobbio show Ferrari in the height of his career, while in his last great masterpiece, the "Choir of Angels" in the dome of the church of Santa Maria dei Miracoli at Saronno, his extraordinary power of expressing activity has succeeded in producing "a busy throng animated with a holy joy." As the author justly remarks, "we marvel at the astonishing vitality of movement, and it almost seems that we hear the bustle of this swarm of angels." Some of the figures appear to be the work of Ferrari's pupils, though this cannot altogether spoil the grand beauty of the whole. Miss Halsey is happy in her description of this, as in

those of the painter's other most important works. We would suggest, however, that her consistent use of Ferrari's Christian name is uncalled for; the master was and is known to the majority as Ferrari, not as Gaudenzio.

The book before us is illustrated with some forty reproductions, including a fine one of the "Holy Family," now at Dorchester House, and, indeed, practically the only important example of Ferrari's work in Great Britain, the "Christ Rising from the Tomb" in the National Gallery probably being largely the work of Della Cerva, one of Ferrari's pupils. A copious bibliography, a chronology, and an exhaustive catalogue of the master's works add value to a book which shows every sign of careful and earnest work.

Old Cottages, Farmhouses, and other Stone Buildings in the Cotswold District. By W. GALSORTHY DAVIE and E. GUY DAWBER. London: B. T. Batsford. 1905.

THIS volume is the outcome of the success which attended the publication of its forerunner and companion volume, entitled "Old Cottages and Farmhouses in Kent and Sussex." Mr. Dawber's personal acquaintance with the Cotswold district, in which, by the way, he has done much delightful domestic building, specially fits him for writing the introduction and explanatory notes to Mr. Galsworthy Davie's excellent photographs. Such a collection of photographs published in this form are invaluable records. They show buildings, unique of their kind, which are not valued just now at their worth. The unfortunate result is that they year by year decrease in number, too often to be replaced by inferior building both in design and of materials unsuitable to the district. Such a book draws attention to these changes and is helpful in forming a healthy public opinion in favour of the old houses, their appearance and manner of building. The photographs, eighty-six in number, are enhanced by the eighty-six plans, diagrams, and sketches by Mr. Dawber. The buildings are all of the native stone, gabled, roofed with stone or with thatch, and with chimneys which are always made a charming feature of the house. The date of the work shown varies from the end of the XVIth century to about 1700—broadly speaking, 1580 to 1690. The plans invariably show a house one room in thickness, which of course entails passages, rooms which would not be tolerated at the present day. The modern architect has more complicated conditions to face than those of the XVIth century, and it is therefore more difficult for him truthfully to attain the quiet and simple lines of the old houses which we so much admire. An analysis of the eighty-six illustrations shows a surprising similarity of features. The methods of expression are few; repetition is continually relied upon, with results neither tedious nor dull; the illustrations show a period of building in one district characterised throughout by breadth and simple dignity. The work both for its illustrations and its analysis is a valuable volume to all interested in domestic architecture and is very tastefully got up by the publisher.

The Artistic Crafts Series: School Copies and Examples. Selected by W. R. LETHBRIDGE and A. H. CHRISTIE. London: John Hogg. 1904.

At first sight the collection of drawings opening this series of School Copies and Examples is somewhat startling. The explanatory note to the series, however, shows the purpose that the reproductions are intended to serve. They are in the nature of a counterpoise to the usual school copies. The authors consider "it has been too much the habit in drawing copies to sacrifice the beauty of the example to some theory of method in instruction, as balance, clearness of outline, and so on." It is their purpose "on the other hand, to put the fine suggestive and useful material before the student, so that he may at once have drawing copies of a real kind, standards of excellence, and examples of historical art, which should stir his imagination and suggest the very purpose of art." The present portfolio contains facsimile enlargements of woodcuts and prints; two from woodcuts from Bewick, a leopard and a tiger; an engraving of about 1540 of Raphael's Apollo; and two woodcuts from early Italian books; a useful alphabet of Roman capital letters of the XVIth century; two examples of flower drawing from "Flora Londinensis"; two copies of ornamental capital letters;

the earliest form of the English Coat of Arms; and an old English ship of war of Armada times from a tapestry. It is not suggested that the copies should necessarily be literal, but in various methods; they are, in short, not to supplant the study of nature, but to stimulate the imagination in its representation. The illustrations of William Curtis's "Flora Londinensis" have probably never been excelled, nor Bewick's woodcuts of quadrupeds and birds, but it is only after a careful study of nature and the difficulties of representing her by draughtsmanship that their excellencies become apparent to the student. Were a student to base his work only on that of other men, their faults would be liable to be magnified, and their good points lost sight of, but in the case of craftsmen, for whom these drawing copies are primarily intended, the old methods have a special significance and value.

Ham House: its History and its Art Treasures. By MRS. CHARLES ROUNDELL. London: Geo. Bell & Sons. 1904.

THIS is a splendid publication in its way, but it is wrongly entitled, since it is not a history of Ham House but of the people who owned it and who lived there in successive generations. There is no index to the book; and as far as we have been able to discover there is not even any mention as to who actually built Ham House, or the date of its erection; nor is there any plan of the house. The book is really a sumptuously bound and illustrated family history.

The numerous and very fine plates, however, furnish, along with the text, a valuable record of the interiors and of much of the pictures, furniture, and other works of art in this peculiarly interesting mansion "of more than Italian luxury," where after an interval of two hundred years every article of furniture in the State Apartments occupies its original position, and every picture hangs in its old place.

Illustrations of the exterior and of the hall and the principal rooms are given as separate plates, and all or many of the family portraits by Vandyck, Lely, Kneller, Jansens, Hoppner, and others. The most interesting architectural point in the interior is the treatment of the gallery round the upper part of the hall, which, instead of following in parallel lines the shape of the hall, has an oblique bend towards each end, making the gallery a kind of long-shaped octagon; the effect is very good, as those who have been over the house will remember.

Among the pictures illustrated is the fine bust portrait of Vandyck by himself—as magnificent a gentleman in his style and *tourure* as any of the society celebrities of the day whose portraits he painted. Among the furniture illustrated in the plates is the splendid "Italian-Chinese" cabinet in carved ivory, a sumptuous piece of work on a rather unusual style. There are reproductions also of some of the fine bindings in the library, and of pages of two books printed respectively by Caxton and de Worde.

The authoress has procured the assistance of two experts, Mr. W. Y. Fletcher and Dr. G. C. Williamson, to describe and comment on the contents of the Library and the Miniature Room. She would have done well if she had also secured the assistance of an architect to describe the house and to furnish a plan of it. To give a so-called history of a great house without any statement of its architectural origin and without any plan of it is, from our point of view, an absurd omission; but probably the majority of those who would purchase such a book care very little about this.

Augsburg: Eine Sammlung seiner Hervorragendsten Baudenkmäler. Augsburg: Kutscher & Gehl.

Düsseldorf und seine Bauten. Düsseldorf: L. Schwann. 1904.

THESE two books in illustration of the architecture of Augsburg and of Düsseldorf are produced under the joint supervision of the Architectural and Engineering Societies of the respective cities; but they are very different in scope and in the pains which have been taken over their production. The Augsburg book is simply a collection of illustrations reproduced from photographs, without either text or plans. It gives a kind of collective illustration of the city architecture, commencing with a view of the town hall, a square and bald piece of architecture, effective only from its great height and size. The view of the Jakoberstrasse seen through an archway is effective, and the collection of

photographs gives a general idea of the architecture of the city. The Düsseldorf volume is a very different affair. It is a fully-written history of the city, every illustration of a building is accompanied by its plan, and sections of the principal churches and other buildings are given; there are also plans of the whole city at different periods of its history. It is an admirable descriptive and illustrative record, which does the greatest credit to the two local Societies concerned in its publication. The only fault we have to find is that it is printed on that heavy leaded paper against the use of which we have several times protested. Not only is the shiny surface of this paper disagreeable to the eye, but the result is that this is the heaviest volume for its size that we have ever handled; though only octavo size, it can hardly be read without a desk or a rest to hold it.

English Metal-Work. Ninety-three drawings by W. TWOPENNY (1797-1893). London: Archibald Constable & Co. 1904.

THESE are reproductions from a portfolio of pencil drawings in the British Museum, one of a set by W. Twopenny, an antiquary who added to the love of old work the power of drawing it. The illustrations are beautifully drawn and show an excellent discrimination in choice of subject; their author had an eye for what was best in mediæval work which was most unusual at the date at which he worked. It forms a most interesting and valuable repository of illustrations of mediæval metal-work, including a good many things which are still not familiar in published illustrations. It would have been just as valuable without Mr. Lawrence Binyon's preface of exaggerated and sentimental laudation, accompanied by the sneer at mere architects' drawings which is a part of the stock-in-trade of the contemporary art-critic. When made by architects, he tells us, "such drawings are always apt to be bald and cold and tame." Apparently Mr. Binyon is not acquainted with such publications as the Architectural Association Sketch-book. Mr. Weaver's short notes on the various drawings are suggestive and to the point.

The Royal Insurance Company's Building, Liverpool. London: B. T. Batsford.

THIS is a folio volume de luxe in illustration of a fine building, of which Mr. J. Francis Doyle is the architect, Mr. Norman Shaw having been the "advisory architect," and having had, we should imagine, some part in or influence on the design. It gives a set of exceedingly fine photographs of the exterior and various interiors of the building, and also a reproduction of the working drawing showing the unusual and clever steel trussing by which the upper floors are made entirely self-supporting, the ground floor being left unencumbered by piers for the offices of the Insurance Company. The book is edited by Mr. J. Newby Hetherington, who we presume furnishes also the written text. It forms a fine and monumental addition to an architectural library.

The Alhambra. By ALBERT F. CALVERT. London: Geo. Philip & Son. 1904.

THIS, as far as the writing is concerned, is only a popular or what may be called a drawing-room book, beautifully bound and got up; but it is sumptuously illustrated, and it has a value to architects in this sense, inasmuch as it contains fine reproductions, on a smaller scale, of all the coloured prints of the decoration produced in Owen Jones's book on the Alhambra. These, and the other numerous illustrations and plans, render it a valuable volume, as it comprises complete illustrations of the Alhambra, though on a rather small scale.

Old Houses in Edinburgh. Drawn by BRUCE HOME. Part I. London: S. Bagster & Sons. (In progress.)

THIS work, which is to be complete in about sixteen parts at a shilling each, forms a publication both of antiquarian and artistic interest. This part contains only three plates, which we presume is to be the number for each part; but they are plates exceptionally good both in printing and in the original drawing and execution. Many of the old houses which are to be illustrated in this publication may very likely not survive much longer, and the preservation of their appearance in good illustrations is therefore all the more valuable. Such an old house as that called "Lady Stair's

House" (and which we note is said to banow "in process of alteration") seems like a part of the history of old Scotland, enabling us to realise the better the aspect and character of even the happier lives (and Lady Stair's is said to have been such) in that disturbed and turbulent period. The short accounts of each plate are printed in a fine bold type, decorated with large finely designed initial letters in black line; the whole make-up of the publication is in keeping with its subject, and it is certainly a wonderful shillingworth. Professor Baldwin Brown contributes a brief introduction.

A Catalogue of Zodiacs and Planispheres. By the REV. A. B. GRIMALDI. London and Edinburgh: Gall & Inglis. 1905.

THIS is a small book which represents a great deal of labour and research. The author has catalogued more than 1,400 representations of zodiacs and planispheres represented on inscribed stones, coins, and drawings or engravings. Brief descriptive notes are given with each, together with a reference to the place or book where they may be found. The catalogue must be of the greatest use to anyone studying this curious and fascinating subject.

COMPETITIONS.

CLOCK TOWER, ST. GEORGE'S CIRCUS, S.E.—The premiums in this competition have been awarded as follows:—First, design No. 12, Mr. J. F. Groll, 18, Turner-buildings, Millbank Estate, Westminster, S.W. Second, design No. 31, Mr. Leslie Wilkinson, 3, Ravensbourne-gardens, Ealing, W. Third, design No. 4, Mr. Alexander Peacock, 31, Brownlow-terrace, Finchley, N. One hundred and six designs were received. Messrs. Thomson & Pomeroy were the assessors.

CHURCH, EPSOM.—The general committee appointed to carry out the proposed new Parish Church building scheme met at the Public Hall recently, and it was reported that the President of the Institute of Architects had been asked to nominate an assessor, and the committee had confirmed his nomination by appointing Mr. Fellowes Prynn. The Chairman said that the committee in consultation with Mr. Prynn had decided to invite seven gentlemen to compete, and their names were:—Messrs. Temple Moore (Westminster), Nicholson & Corlette (Lincoln's Inn), C. H. M. Mileham (Lincoln's Inn-fields), W. H. Bidlake (Birmingham), Charles Spooner (Chiswick Mall), and two local gentlemen, Messrs. J. Bannister and J. Hatchard Smith. The Chairman also read out conditions and instructions (drawn up for the meeting's approval) for the competing architects. These set forth that the building was to accommodate about 1,000 people, exclusive of the choir; that the cost, including lighting, heating, seating, architect's fees, clerk of works expenses, and cost of tower and spire, should not exceed 14,500. The action of the Building Committee in appointing only two Epsom architects was criticised. The reply was that the competition was a limited, not an open, one and that 20% was to be paid to each architect for preparing plans. A motion that two more Epsom architects be allowed to compete was defeated on the casting vote of the Chairman, and the Building Committee's Report was adopted.

Correspondence.

HEATING BENEATH THE FLOOR.

SIR,—I notice in the description of the Chapel of King Edward VII. Sanatorium, in your issue for April 22, that the method of heating the floor from beneath is "a novelty in this country"—meaning, I suppose, England.

I think not; I thus warmed and kept dry the floor of the Manchester Tennis Court in 1879—I think that was the date of its building; and, unless I am much mistaken, Mr. Bodley warmed the whole floor of the nave of his beautiful Church of St. Augustine, Pendlebury, near Manchester, at, or perhaps a little prior to, the date above given.

GEORGE T. REDMAYNE,
Architect.

Illustrations.

PROPOSED BUILDING AT THE EAST END OF THE MALL.

THIS is the design by Sir Aston Webb, exhibited at the Royal Academy and referred to in our first article in this issue, for a building to form an entrance to the Queen Victoria Memorial Processional Road, and to connect the Mall with Charing Cross.

In regard to the intention of the design, Sir Aston Webb writes:—

"This building is required for the further accommodation of the Admiralty, and will be used partly as offices and partly as residences for the First Lord and First Sea Lord."

"In the original design for the junction of the Mall and Charing Cross a large circus had been arranged, but it being found necessary to occupy a portion of the site for building, the same idea has been retained with a smaller circus. This arrangement has the additional advantage of closing the vista both from the Mall and the Strand with an important building and screening the change of axis of the two roads, while it also shuts out the view of the commercial buildings and advertisements at present seen from the Mall."

"The plan clearly shows the proposed arrangement. The new building will be connected to the present Admiralty buildings by a bridge on the first floor and also by a subway, and will be faced throughout with Portland stone."

THREE DESIGNS FOR HOUSES.

THE three houses illustrated in this issue, one of which is in prospect only and the other two carried out, are all by one architect, Mr. Ernest Newton, and the drawings are all exhibited at the Royal Academy.

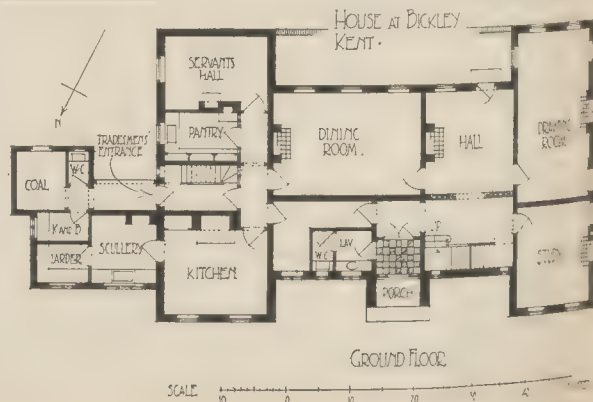
Mr. Newton gives us the following notes on the three illustrations:—

PROPOSED HOUSE AT BRIGATE.

This house has not yet been built. The intended materials are red brick and tiles, the bays covered with cast lead between the heads of the ground floor windows and the eaves of the first floor windows.

HOUSE AT BICKLEY.

This house is built in Bickley Park, and occupies part of the grounds of Bickley Hall.



HOUSE AT TRISCOMBE.
SOMERSET



It is built of red brick, and the roof is of dark red hand-made Wrotham tiles. The builder is Mr. F. F. Duthoit, of Bromley, Kent.

HOUSE AT TRISCOMBE, SOMERSET.
This house is built at Triscombe, between Downton and Minehead. As the position is exposed, the building has been kept low, and the walls all covered with cement rough cast. The roof is covered with thick selected green slates of mixed colours, which vary from green to deep orange. The house, stables, lodge, and cottages have been built by Mr. Henry Pollard, of Bridgwater. Mr. Webber has acted as clerk of works. All the lead glazing and sashments are carried out by Messrs. Burt & Potts, and the heating and hot-water work generally by Messrs. Crispin, of Bristol.

BOOKS RECEIVED.
WERN: AN AMFANO DES XX JAHREHUNDERTS. Reithert von Ingenieur Paul Kortz. (Gerlach & Wiedling, Vienna.)

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE-STEEL.—XVII.

BUSINESS PREMISES IN SOUTHAMPTON.

THE building illustrated in the accompanying series of drawings was erected during last year, from the designs and under the superintendence of Messrs. Poole & Sons, while the concrete-steel construction was executed under the direction of Mr. L. G. Mouchel, M. Soc. Ing. Civ. (France), agent-general for the Hennebique patents in Great Britain. This structure was designed to serve the purpose of a drapery business, and is situated in East-street, Southampton.

Owing to the restrictive character of the Southampton Building regulations, which, like the London Building Act, demand certain specified wall thicknesses without making allowance in any way for the physical properties of the material employed, the outer walls of the structure were built in brick, with the addition of masonry in the form of cornices, mullions, and balustrades.

Notwithstanding this limitation, the building serves very well as an illustration of the advantages offered by reinforced construction, as the whole of the interior work—including columns,

column foundations, floors, partition walls, and staircases, as well as the roof—is of concrete-steel, and columns of the same material are also incorporated in the outer walls.

The principal façade, which is on East-street, has a length of 40 ft., the other façade on the Strand having a length of 47 ft. The building includes four stories exclusive of the basement, the height being 64 ft. from foundation level to the top of the flat roof and 69 ft. to the top of the mansard roof. Above the latter is a storage tank of circular form constructed in concrete-steel, the tank having a mean diameter of 5 ft. 6 in. and a depth of 2 ft. 9 in., outside measurements.

On the Strand frontage two openings are provided, as shown in Figs. 118 and 119, giving access to the basement, the larger opening for merchandise and the smaller one for coals. It is unnecessary to devote space to a description of the exterior walls of the building, the disposition and relative thickness of which are made sufficiently clear by the basement plan, Fig. 118, and on the ground floor plan, Fig. 119. We may mention in passing that the footings consist of concrete and are 5 ft. wide by 2 ft. deep. The broken lines along the street frontages and the party wall lines in Fig. 118 indicate the outside edge of the foundation course, of which two sections will be observed in Fig. 117.

Fig. 118 shows the arrangement of the interior columns and the areas of their bases, which are of the general construction illustrated by Fig. 39 on p. 528 in our issue of November 21, 1903. Typical outline sections of the bases are included in Fig. 117, by which it may be seen that the slope of the upper surface is varied according to requirements, but the uniform thickness of 12 in. has been adopted as a minimum. In every case the lower surface is at a level of 4 ft. 6 in. below the basement floor.

For the five thin columns incorporated in the brick walls of the building the foundations measure 6 ft. square by 1 ft. 9 in. deep at the centre, tapering down to 12 in. deep at the edges. Of the five interior foundations (see Fig. 118) three measure 6 ft. square by 1 ft. 6 in., and 12 in. deep at the centre and edges respectively; one, which has to afford support for a large and a small column, has a length of 7 ft. 8 in., a width of 6 ft., and thicknesses of 1 ft. 3 in. and 12 in.; and the last, which supports a small column near the back of the premises, measures 4 ft. square, and has maximum and minimum thicknesses of 1 ft. 6 in. and 12 in. respectively.

The five columns in the exterior walls are necessary for the reinforcement of the brick-

work, so as to afford adequate support for the concrete-steel bressummers carrying the walls and masonry over the window and door openings on the ground floor. It was necessary to make these columns of the smallest possible cross-sectional area and with a minimum thickness. In consequence of this requirement, they were designed so as to measure only 7 in. thick by 18 in. wide.

The calculated load upon each of these slender columns is about 116,500 lb., and as the cross-sectional area is only $7 \times 18 = 126$ sq. in., the load is approximately 925 lb. per sq. in. The height of the basement is 10 ft. = 120 in.

By calculating the safe load for a cast-iron column of equal length and cross section, it will be found that the load actually carried by each of these concrete-steel columns does not compare at all unfavourably, especially when the relative weights of the materials are taken into account. Of course, much depends upon the basis of the calculation and the factor of safety allowed.

If it be assumed that the ends of the cast-iron column are rounded or jointed, the computed result will be much smaller than that calculated upon the assumption that the ends are rigidly fixed.

Rankine's formula giving the value for (P) the breaking load for round-ended columns is:—

$$P = \frac{fS}{1 + \frac{4l^2}{c r^2}}$$

or, calculating per square inch by omitting the factor (S), which represents the sectional area of the column:—

$$P = \frac{f}{1 + \frac{4l^2}{c r^2}}$$

The value of Rankine's co-efficients for cast iron are:—

$f = 80,000$ lb., $c = 3,200$.
The value of r^2 , the square of the least radius of gyration, is $h^2 + 12 = 49 + 12 = 61$, approximately; and as in the present example $l = 120$ in., the breaking load per square inch would be:—

$$P = \frac{80,000}{1 + \frac{4 \times 14,400}{3,200 \times 61}} = \frac{80,000}{5.5} = 14,545 \text{ lb.}$$

Employing 8 as the factor of safety, the safe load becomes $14,545 \div 8 = 1,818$ lb. per sq. in.

would place concrete-steel at much greater disadvantage, but it must be remembered that in the case of independent columns the steel would require most adequate protection against the effects of fire, and, although the massive dimensions of the metal itself might be considerably less than that of concrete-steel, the outer covering of fire-resisting material would probably reduce this disadvantage to a very considerable extent, besides adding largely to the total cost of the work.

The four principal independent interior columns of the building at Southampton are of square section, as shown in Figs. 118 and 119, and of the construction illustrated in Figs. 122, 123, and 124. The dimensions commence at 14 in. square in the basement and diminish to 8 in. square at the third floor. The total load carried by each column is about 200,000 lb., equal to 1,020 lb. per sq. in. of sectional area.

It would be interesting to make calculations for comparing concrete-steel with cast iron in the case of these columns. This time, however, we will make an approximate computation by the table of hollow cast-iron columns given on p. 425 of vol. lxxviii.

The height of the 14-in. square portion of the concrete-steel columns is 120 in. Allowing 2½ in. on each side for fire protection, we have 9 in. square as the available dimensions of a cast-iron column, in which length ÷ diameter = $120 \div 9 = 13.3$. The value for this ratio by the table is, say, 59,000 lb. for a square column, this being the breaking load per sq. in. Dividing by 8 to give the same factor of safety as before we get $59,000 \div 8 = 7,375$ lb. This is the safe load per sq. in., and the requisite area of metal is $200,000 \div 7,375 = 27$ sq. in. This makes the area of the hollow inside the column 7.35 in. square, and the thickness of metal 0.825 in., or nearly $\frac{3}{4}$ in.

Therefore the 14-in. square concrete-steel column is equal in strength to a 9-in. square hollow cast-iron column with sides about $\frac{3}{4}$ in. thick, and the final dimensions of the latter after the addition of fire-resisting material would be very similar to those of the concrete-steel construction.

An additional element of strength is afforded in the case of concrete-steel by the secure connection of the longitudinal reinforcement with the concrete of the main beams, and by the monolithic character of the entire work.

Fig. 119 is a plan of the ground floor showing the arrangement of the beams, typical sections of which will be found in Figs. 120, 121, and 122. Fig. 125 is another typical section giving a general idea of the continuous-girder construction embodied in the floor system. The span of the main beams on the ground floor is 13 ft., the cross section of these beams being 9 in. deep by 7 in. wide, and the thickness of the intervening floor slab is 4 in. The calculated superload for this floor was 168 lb. per sq. ft. On the first floor the span of the main beams is 13 ft., the section of the beams 9 in. deep by 7 in. wide, and the thickness of the floor slab 4 in., the calculated superload being 280 lb. per sq. ft.

On the first and second mezzanine floors (see Fig. 117) the superload was calculated at 110 lb. per sq. ft., and the floor slab is 4 in. thick. At the first mezzanine floor there are two concrete-steel breasted beams 15 in. deep by 14 in. wide, which carry one of the 14-in. exterior brick walls from this level up to the roof, as well as part of the roof load and the weight of some of the other floors. On the second mezzanine floor part of the floor system is designed on the cantilever principle, being carried on a beam which in turn is a cantilever supported by some of the other main beams.

For the second and third floors the superloads were calculated at 224 lb. per sq. ft., the main beams measuring 9 in. deep by 7 in. wide, and the floor slab 4 in. thick.

The roof is constructed entirely in concrete-steel without intermediate support, and consists of concrete-steel principals with a span of 37 ft., connected by a roof slab of the same material. The staircase from the ground floor to the roof is entirely of concrete-steel, being very similar in construction to staircases described in previous articles.

THE ELECTRICAL STANDARDIZING INSTITUTION.—It is announced that the new premises, 16-20, Southampton-row, London, will be completed and ready for the reception of students for the summer term on Monday, May 1.

ART-TRADE SCHOOLS IN GERMANY.

DR. FREDERICK ROSE, British Consul at Stuttgart, recently added another to his many interesting and valuable reports on educational matters. His present paper treats of "Art-Trade Schools in Germany." After some introductory observations, in which he assumes that the movement for the foundation of such schools dated from the Great London Exhibition in 1851, he points out that the first country to profit by the lessons inculcated by that event was the United Kingdom, where the creation of the Department of Science and Art and the South Kensington Museum mark the earliest systematic attempt to place the art-trade industries of the country upon an independent national basis, and to promote and control their development. The means adopted towards this end included the formation of collections of representative products of the art-trade industries, the holding of lectures on art, industrial art, and technology, the foundation of instruction workshops, the extension of instruction in drawing and modelling, the public recognition of distinguished work, and other measures. Germany was not slow to profit by the United Kingdom's example, and her art-trade schools and museums founded during the latter half of the past century have followed British models to some extent; at the same time, however, they have been founded and developed upon the basis of the educational views prevailing in Germany, one of their distinguishing features being the promotion of intimate relations between the aims of the schools and the needs of the local and district art-trade branches of industry.

The number of art-trade schools founded in Germany up to the present is twenty-seven. They are generally divided into preparatory classes (Vorklassen), and special classes for the different branches of art-trades (Fachklassen). In many cases evening continuation classes for general subjects of instruction and for special instruction in art-trades are attached, evening and Sunday schools for drawing being also found. The instruction in the art-trade schools is given, to a great extent, in the daytime, and the connexion between the day and evening classes of the same institute—where such exists—is sometimes of a loose, sometimes of a more intimate character, having been gradually determined by local requirements, financial conditions, gradual development, and other considerations. Where the art schools are combined with drawing and artisans' schools a much larger amount of evening instruction is given.

The instruction in the preparatory classes includes drawing of ornaments from charts and plastic examples, drawing and painting of objects from the animal, vegetable, and mineral worlds, modelling of ornaments and figurative objects, knowledge of projection, shading, anatomy, history of art, methods of drawing instruction, and so forth.

The special classes only admit pupils who have already acquired a certain measure of preliminary artistic training either in the preparatory classes or elsewhere. They are often attached to studios or instruction workshops (Lehrwerkstätten), and are generally divided into several principal groups accordingly as they devote special attention to architecture, sculpture, or painting, and the multifarious branches of petty art. Their number is not fixed, but additional workshops and studios are added from time to time according to the development and requirements of the art trades in the towns in which the schools are situated or in the surrounding districts. The departments and classes generally include architectural drawing, chasing, engraving, wood-carving, decorative painting, pattern-drawing and designing of all descriptions, enamelling, art-metal work, etc.

The development of the German art-trade schools is still progressing, and, as many of them are still in the first tentative, experimental stage of their existence, the details of their internal equipment and organisation are consequently by no means settled. It is most noteworthy that they closely observe and study British methods and equipments of art-trade instruction, and adopt without reserve whatever they find adapted to their own conditions and environment.

Art-trade instruction in Germany is by no means confined to the art-trade schools. Certain branches of art trades are taught in special schools of a separate, independent nature, which generally confine themselves to instruction in one particular branch. In this connexion the special schools for the ceramic industries, the schools for the wood-working industries, and the schools for special branches of the metal industries may be mentioned. A certain amount of art-trade instruction is also imparted in the building-trade schools, and in

the architectural faculties of the technical universities.

The general aim of the art-trade schools is briefly the application of art to industry, the endeavour to impart the methods and develop the faculties for the utilisation of the graceful and harmonious in Nature in the production of the ordinary practical objects of trade and daily use. To durability and serviceability, the two cardinal principles necessary in the production of goods, are to be wedded grace of form and harmony of colour. The art-trade worker must not be a mere mechanical producer of useful wares, but must imbue his work with the sense of the beautiful drawn from the measure of his own talent, and his contemplation and interpretation of the great book of Nature. It may also be observed that the art-trade schools stand on a higher artistic level than the combined art-trade and artisans' schools. They stand in closer connexion to schools of pure art, and endeavour to train technical artists (technische Künstler), not art-skilled artisans (kunstfertige Handwerker). The art-trade schools also endeavour to give their instruction in the daytime to full-time pupils, whilst the combined art-trade and artisans' schools lay greater stress upon evening instruction. Dr. Rose proceeds to give a description of the individual schools and their detailed work. As an example, we quote some of the particulars furnished respecting the establishment at Mainz, which our author places first in his list.

The art-trade school at Mainz is connected with an artisans' school, and an evening school for drawing and modelling. It was founded in the year 1841 as an artisans' school (Handwerkerschule), and was given a few rooms in a Carmelite convent. With the aid of the proceeds of some small industrial exhibitions and private munificence, a special school building was erected in 1878, to which various additions were made in 1884, 1888, and finally in 1903, the last-mentioned being on a very large scale. The art-trade school was separated from the artisans' school in the year 1873, with the name of "Public Drawing Hall," and was given a special curriculum and Director; in the year 1894, however, they were again united under the management of one Director.

The instruction in the art-trade school is given during the day, with a few hours in the evening in special cases. The instruction in the artisans' school is given in the evening and on Sunday mornings. The instruction in Department II.—for workmen engaged in building and for decorative painters—is given during the day, but only in the winter months.

The art-trade school, developed in the course of time from local requirements and conditions, aims at imparting the necessary artistic knowledge and ability for the successful prosecution of the various branches of the art trades of Mainz and the surrounding districts. It aims more especially at imparting that measure of special knowledge which cannot be adequately acquired during the ordinary terms of apprenticeship in the art-trade workshops; for this reason a necessary period of previous practical work is required for entrance to the schools, and pupils without this qualification who have passed through the preparatory classes are required to remedy this deficiency by undergoing a period of practical work before entering any one of the eight special art-trade divisions. In pursuance of the general aim of the school the multifarious branches of the art-trades have been combined and reduced to eight special divisions, and special drawing courses have been arranged for general art-trade draughtsmen, furniture designers, building draughtsmen, decorative painters, wood-carvers, modellers, workers in artistic door fittings, goldsmiths, chasers, engravers, persons engaged in the ceramic industries, artists in glasswork, upholsterers, decorators, sculptors, and others. Several of the special divisions have been provided with workshops in order to facilitate a thorough practical instruction in addition to the training in drawing and general artistic principles. The school is also entitled—under certain conditions—to grant diplomas entitling the holders to teach certain branches of art trades, and it also undertakes the training of future masters and mistresses of frehand and art-trade drawing. It is noteworthy that special attention is devoted to moderately-gifted pupils, and that pupils who do not possess a sufficient measure of the artistic faculty are not admitted to the school.

The aim of the artisans' school is to provide general and special instruction in modelling, finishing with special courses for apprentices, journeymen, and master workmen in the different branches of art trades. The

evening continuation school, which is attached to the artisans' school, aims at giving general instruction, and includes, besides the subjects already mentioned, such subjects as plane and solid geometry, natural science, mechanics, estimates, historical development of various trades, etc.

The evening drawing and modelling school is completely separate from the day (art-trade) school, and is intended for all those whose occupations do not permit of attendance at the day school, and for such pupils as only attend part of the day instruction; for these latter the evening drawing and modelling school is compulsory in order to prevent them from lagging behind and impeding the course of the instruction. It is also compulsory—for certain subjects—for all pupils of the preparatory school, and for all backward pupils of the art-trade school. The evening drawing and modelling school may be therefore generally regarded as an extra tuition course for the art-trade school.

The following remarks apply only to the art-trade school:—The pupils are divided into two principal classes—ordinary and extraordinary pupils. Pupils for the preparatory school must be at least 14 years old, and have completed the course of the elementary schools; pupils for the special branches of the art-trade school must be at least 15 years old and must produce proof of artistic talent and training. The sole difference at this art-trade school between ordinary and extraordinary pupils consists in the fact that the former attend during the whole week, the latter at least three days per week. The fees are payable in advance, and amount to only 1s. 15s. per half-year for pupils of the preparatory school and the eight special branches and the women and girls' department, and to 5s. for the evening modelling and drawing school; extraordinary pupils pay 4s. per half-year extra fee, and all pupils pay an entrance fee of 3s. Indigent pupils may be wholly or partially dispensed from the payment of fees. A small number of scholarships are also available, but the amounts are insignificant as compared with those available in the United Kingdom.

After giving elaborate details of the subjects of instruction, together with the number of hours per week devoted to the several lectures, exercises, and practical work, Dr. Rose remarks that, although the instruction in the art-trade school in its branches still corresponds, generally speaking, to the programme previously drawn up for the school, yet alterations in the method of teaching, material of instruction, etc., take place every year. Formerly, following the tendency of the times, the study of the antique and earlier styles stood in the forefront of the instruction, and everything tended towards the attainment of as complete a knowledge as possible of the various styles. During the last few years, however, the cultivation of the individual's own style or characteristics is now taking its natural dominating position. The object of the study of the ornamental forms of the old style is no longer to create an apparent correctness in style by exact imitation of foreign styles and combination of various correct motives of style; it is now generally accepted that a German cannot feel, think, and create, artistically, in the same manner as the Chinese and Indian, or a Russian like the Japanese, and that, therefore, the man of the XXth century cannot feel, create, and receive impressions like the man of the Gothic or Roman period. The study of the old styles, however, still gives, and always will give, an indication as to how art and art-work have developed in accordance with the different feelings of different times and peoples, and it will always be its province to indicate and teach what each one should strive to attain in his own particular period and circumstances. On the basis of this recognition, combined with the regular study of the surroundings, landscape, and comprehension of the local colouring, Nature studies of the characteristics of plants, animals, and men, the school endeavours to educate the students of the school in independent work by the cultivation of their own styles; the awarding of prizes for personal designs assists the endeavours in this direction. The observation of home art is cultivated by direct reference to the same, or by the pupils being set the task of themselves seeking out the most beautiful and picturesque subjects of their native district, and recording it by drawings from Nature. A very special object which the school seeks to attain is faultless artistic representation, which is demanded in all draughtsmen's work, and is even extended to the preparation of large details for the sake of practice.

As appears from the long existence of the workshops, the endeavour of the school has

always been to cultivate instruction in manual dexterity. The independent construction of models embodying their own designs is intended to safeguard the students against a one-sided purely draughtsman's instruction; it is intended at the same time to enable those art-trade designers who in future will be occupied more with designing than with the practical making of art-trade objects, to test the practicability of their own designs and their effect when embodied. The work in the instruction workshops thus affords the students opportunities of ascertaining what special materials can be suggested or what effects may be obtained by various methods of treatment, and, generally speaking, all productive advantages which instruction in manual skill affords are, as far as possible, utilised. In the instruction workshops the possibility of a complete artistic and practical manual training is also afforded. The students in the architectural department of the school therefore make models or architectural forms in gypsum, cardboard and saw-wood; the furniture designers and art cabinet-makers work out their designs as sketch models in clay or plastilin, and share in the instruction in wood-carving, veneer-cutting, etching wood, and other instruction in carpentry. The art-trade designers and lithographers etch in copper and zinc, engrave ornaments in various materials, make copper printing plates from their own designs and sketches, print with the same in the copper printing press, and practice drawing on stone and algraphy; they model in clay and plastilin, or emboss, punch, and cut leather, and execute work by the etching process. The economic designs of the pupils are also executed in the actual workshops; the pupils turn their vases or vessels on the wheel, glaze and fire them, paint them with slip painting or with the casting horn, etc.

The attendances at the art-trade and artisans' school, which, in 1884, amounted to 1,234, had risen in 1903 to 1,846. For this number of pupils a teaching staff is provided consisting of seventy-two professors, masters, assistants, architects, engineers, painters, drawing masters, modellers, special technical masters, lithographers, and master workmen and representatives of the various branches of the art trades. The total expenditure for school buildings, as they stand at present, must amount to about 25,000l.; this sum does not include all the interior equipment for the workshops. The school is not self-supporting, this being evident from the low rate of fees charged—and is in the receipt of the annual support indicated by these figures:—State, 2,200l.; town, 1,000l.; district, 50l.; District Savings Bank, 60l.; Mainz Industrial Association (annual), 850l.; ditto (extraordinary), 315l.; miscellaneous, 15l.; total, 4,490l. The relations of the school to the art-trade industries of the town and neighbourhood are of the most intimate and cordial nature; it is, in fact, practically to the Mainz Trade Association (Gewerbeverein) that the school owes its foundation and maintenance. Pupils who leave the school, after having completed the full courses of instruction, find readily find occupation in all the branches of the art trades. Constant inquiries are made at the school on the part of art-trade manufacturers desirous of acquiring fully-trained and skilled assistance. The school remains in this manner in close touch with the industries concerned, and is enabled to impress upon intending pupils the necessity of a period of practical work before joining the school.

After reviewing in detail the art-trade schools of Munich, Nuremberg, Leipzig, Dresden, Düsseldorf, Strassburg, Stuttgart, Aix, Altona, Barmen, Berlin, Charlottenburg, Breslau, Frankfurt-on-the-Main, Cassel, Cologne, Erfurt, Hanover, Karlsruhe, Königsburg, Magdeburg, Pforzheim, and Weimar, Dr. Rose makes the following concluding observations:—

It is scarcely possible at present to utter a definite expression of opinion upon the relative merits and failings of the German art-trade schools, as many of them are of too recent origin, and others have only lately been reorganised. The movement in favour of art-trade instruction seems to be still in an experimental and tentative stage, and some time must yet elapse before anything like uniformity is attained in the methods of instruction or unanimity arrived at regarding the cardinal principles of art involved in art-trade instruction. Taken as a whole, with some exceptions, the art-trade schools have not attained the high-water mark of efficiency occupied by technical schools.

A weak point is the paucity of instruction workshops, and the insufficient equipment and accommodation of those already installed. This has been caused by the lack of the necessary funds and by the failure to grasp the important rôle played by such work-

shops in art-trade instruction. These defects, however, are being rapidly remedied, the best proof of this being the large sums voted for new buildings and extensions, and the considerable annual subsidies granted by governments and municipal authorities for purposes of maintenance.

The art-trade products of Germany show much that is desirable and praiseworthy, beside much that is wholly undesirable. But it is beyond reasonable doubt that the production of the former has been influenced by the art-trade schools, and that the production of the latter is due partly to manufacture solely for the purposes of profit, and partly to the indifference of an undiscriminating public. However, good taste and superior manufacture, the fruits of the spread of art-trade instruction, are gradually but surely prevailing.

OBITUARY.

COLONEL STANLEY BIRD.—We regret to announce the death, after a few days' illness, of Colonel Stanley George Bird, C.B., which occurred at his residence, Ashdown House, Hungershall Park, Tunbridge Wells, on the 18th inst., in his 68th year. He was one of the founders and hon. secretary of the Institute of Commanding Officers of Volunteers. In business Colonel Bird was connected with the building trade. He was the eldest son of the late Mr. George Bird, of the Hall, Pinner and married, in 1862, Charlotte, daughter of Mr. T. S. Wall. He was also the originator of the Central Association of Master Builders of London (now the London Master Builders' Association). He was one of the prime movers in establishing the National Association of Builders, and the moving spirit in transforming the old Builders' Society, established in 1834, into the Institute of Builders (Incorporated), of which Institute he was President for the first three years of its incorporated existence. He had been chairman of the Builders' Accident Insurance Company since its foundation, in 1881, and had been twice Master of the Tyndal and Dr. Masters' Company, being, at the time of his death, Chairman of that guild. For many years he was Chairman of St. Mary's Hospital, Paddington, and a director of the Westminster Fire Office and of the Crystal Glass Insurance Company. The funeral took place on Saturday, April 22, at one o'clock on Saturday, April 22, and among those present, in addition to the members of the family were the General Sir Alfred Turpin, K.C.B., Mr. C. J. Maton, Mr. E. Woods, Mr. T. Khan (St. Mary's Hospital), Mr. St. John (Westminster Fire Office), and Mr. R. S. Henshaw (representing the directors of the Builders' Accident Insurance Company). At the same hour a memorial service was held in the Garrison Chapel, at Winchester, by the Victoria and St. George's Rifles, quartered there.

MR. J. H. BRIDGE.—We have to record the death of Mr. John Henry Bridge, born at Brewer-street, Maidstone, which occurred at his residence on the 11th inst. The deceased for ten years was secretary to the Maidstone Building Trades' Association, and for many years he also acted as hon. secretary to the Maidstone Natural History Society.

MR. R. GRELINX.—Canadian papers just to hand announce the death, at Toronto, of Mr. Richard Guellon, the inventor of the process of making Mycenian marble. Born in Belgium of French parents, he spent seventeen years in Britain and ten years in the United States, leaving many examples of his work in both countries. During the past three years he had made his home in Canada. The King Edward Hotel and the City Hall are the best examples in Toronto of this marble processes with which his name was connected.

AERIAL ROPEWAYS.—A plan for erecting aerial ropeways for the conveyance of coal from Venice to Mestre on the mainland has been presented to the Ministry for Public Works and Marine in Rome by the engineers Carrissimo & Crotti, of Milan. It is to be on the German system, consisting of two ropeways, one for sending off loaded buckets, containing 500 kilos. each, and the other for bringing back the empty ones. It has been calculated that, when the coal is complete, about 10,000,000 tons of coal a year might be forwarded to Mestre, a part of which would be stored there. The cost of the ropeways might be in the neighbourhood of £1,000,000, and the date of the beginning of the work would be the date of the beginning of the electrical power, which would be supplied by local stations. The project is under consideration.

GENERAL BUILDING NEWS.

CATHOLIC CHURCH, WILKINGTON.—This building at Wilkington, Durham, will, with the cemetery and the site, cost about 4,500*l*. The architects are Messrs. Kelly & Dick, of Newcastle. In the form of a cross, the church, of red-faced stone from Teesdale, is long by 65 ft. broad. There are two apses and the dome, which covers the sanctuary, is about 35 ft. high from the inside. The windows have been supplied by Messrs. Milner, of Newcastle. A corridor leads from the sanctuary to the Presbytery. Mr. Rogers, of Wolsingham, has had the building erected.

ROMAN CATHOLIC CHURCH, ROTHESEY.—A new Roman Catholic church is to be erected at Rotheseby by the Marquis of Bute. The building will have a tower and spire 140 ft. high, with bells and peal of nine bells. Accommodation will be provided for about 100 persons. The plans have been prepared by Mr. R. Weir Schultz, London. The building will be on the archepiscopal principle, the roof being supported by octagonal and circular piers. The flooring is to be of concrete covered with wood blocks and marble. The cost will be 25,000*l*.

CHURCH, WOODHOUSE.—The foundation-stones were laid a short time ago of a new Methodist church which is to be erected in Woodhouse. The building is the design of Messrs. J. P. Earle, architects, of Leeds, and inclusive of furnishing it is estimated to cost 1,800*l*. The style is Gothic, and the interior will be furnished with open-pitch-pine pews, capable of seating 80 persons, and a rostrum of the same material. The structure will be lighted with electric lights, and the ventilation will be on the natural principle, with fresh-air inlets, and exhaustors on the roof, while the heat will be on the low-pressure hot-water system. In addition to the main building a minister's vestry will be erected in the rear of the church. The contractors for the building are Messrs. G. E. Bates, of Intake.

CHURCH, MURRAYFIELD.—At the sitting of the Edinburgh Dean of Guild Court on the 21st inst. a warrant was granted for the erection of a new church at Ormisdale-terrace, Murrayfield. The building will accommodate about 300 persons, but it is not proposed to proceed at present with the upper part of the tower, the chancel, or the north transept. The design of the building is to be proceeded with at once, and will be finished in rubble from Hailes quarry, with dressings from Prudham quarry, and the roof will be of open timber construction. The total cost of what is now to be built will be a little over 6,000*l*. The church is from plans by Mr. A. Hunter Crawford.

CHURCH, ORKNEY, N.B.—The Free Church of Orkneyhill and Ord has not been reopened after renovation. The architects were Messrs. D. & J. R. McMillan, Aberdeen. The contractors for the work are as follows:—Mason, William K. Gray, mason; Portrey, carpenter; John Gordon & Sons, Fordey; Slater, J. G. Laird, Banff; Hunter, James Ingram, Banff; T. Campbell, Banff; painter, Alexander Palmer, Banff; leaded windows, Edward Coland, Aberdeen; seating, William Dawson, Aberdeen. The cost of the buildings will amount to a sum of about 1,000*l*.

CHURCH, WESTON.—The new United Methodist Free Church, which has been erected at the corner of Birchington-avenue and Morley-road, Weston, South Shields, was opened the 21st inst. The new building comprises a church with accommodation for 450 persons, and Sunday schools and meeting-room capable of seating about 400 people. The church is entered from Oxford-street through a vestibule which occupies the whole of the frontage, and gives access to an octagonal tower, a stone staircase leading to the gallery. Behind the platform there is a semi-octagonal apse, with seats arranged for the choir, and a recess for the organ. Vestries are provided at the other end of the building. The schools are placed in Birchington-avenue, and consist of one large hall, meeting-room, and other accommodation on the ground floor, and there is a large schoolroom on the first floor. The architect was Mr. George R. Smith, of South Shields, and the contractors Messrs. W. J. Robertson & Son.

SANATORIUM, DELAMERE FOREST.—The Crossley Sanatorium for Consumptives in Delamere Forest has been handed over, fully furnished and ready for use, to the Manchester Hospital for Consumption. The terrace on which the hospital stands is 480 ft. above sea level, and to the south, the east, and the west there are the views of the Cheshire plain. The near foreground is forest, and about 10 acres of land have been cleared and sown and planted with ornamental shrubs. The façade of the

main building is 300 ft. in length. The sanatorium faces almost due south, and the windows of all the patients' rooms open down to the floor. In nearly every case the window is sufficiently wide to enable a bed to be placed lengthways in the open air or to be lifted into the balcony outside. To the south of the hospital are placed shelters for open-air treatment. Some are fixed and some revolve; each holds either two or four patients. There are twenty-four rooms, on the south side of the building, with single beds, one with two beds, ten wards with four beds, and four wards with six beds. Two large sitting-rooms, with doctor's rooms and office, are also in this part of the building. Behind these are corridors while all lavatories and baths, together with the lifts, are on the north side. At the east and west ends are various storerooms and offices. The collarage is extensive, and here are placed the douche baths and the X-ray plant. From the main building a covered corridor leads to the chapel and the dining-hall, beyond which are the kitchens, nurses' and servants' dining halls, storerooms, and pantries. The patients' dining hall is separated from the chapel by the main corridor. This hall is 60 ft. long by 40 ft. wide. The patients will dine at twelve tables, each to accommodate eight persons. The dining hall has been made the fireplace, which stands in a large recess. The chapel will provide accommodation for 150 persons. It has an apsidal east end, paneled in wood. On the north and the two sides of the altar are "three-light" windows filled with lead lights simply treated. The space in the east-end wall is occupied by rooster canopy and the roof is of the cloister of the hospital. The walls and the woodwork are coloured in shades of red and green. Ample ventilation is provided, and the windows, except those in the apse, open down to the floor level. The nurses' home stands about 80 yds. from the main block, and provides accommodation for nurses and servants. The laundry, engine and boiler house, gas plant, bacteriological department, and mortuary, stables, and cottages stand on the north side of the main road which runs between the main building and the kitchen block and past the nurses' home. Two cottages have been built for attendants. The laundry separate machinery has been provided for the clothes of patients and the staff, but everything will pass through a disinfectant before entering the laundry at all. Adjoining the laundry stands the engine-house, which contains two different classes of plant for the electric lighting of the hospital, on-steam-driven and the other driven by gas. It is thought that the one will be more economical in summer and the other in winter. Next is the boiler-house, with two steam boilers. All the heating of the hospital, as well as the hot-water supply for baths and the steam for cooking, is provided from these boilers. The steam is taken from the boilers to the calorifiers in the main block, and these warm the circulating water. Beyond all these stand the sewage works, about 600 yds. to the south-west. Here bacteriological treatment has been adopted, while 8 acres of sloping ground have been secured for the final land filtration process before the effluent can be admitted to the forest brooks. At the point where a wall has been sunk to a depth of 500 ft. below sea level. The buildings are fitted throughout with fire hose, and everything has been done by means of outside fire escapes and apparatus to reduce danger from fire to a minimum. All floors, in corridors, wards, and hall, including the chapel, have been covered with linoleum. It was thought that it would be warmer and more comfortable than the usual waxed ward floor, besides being more easily cleaned. Each patient has the use of a combined chest of drawers, wardrobe, and dressing-table. The elevation of the main building is faced with red Ruabon bricks up to the first floor. The upper stories are rough-cast in white spar, with red brick quoins and strings. All the buildings are roofed with Ruabon tiles. The original estimate of the cost of the sanatorium was 70,000*l*, but this sum, we understand, has been exceeded. The architect was Mr. W. Cecil Hardisty.—*Manchester Guardian*.

CREMATORIUM, SHEFFIELD.—The new crematorium, erected by the Sheffield Corporation at the City-road cemetery, was opened on the 5th inst. The work, which was carried out from designs prepared by Messrs. C. & C. M. Hatfield, architects, was illustrated in our issue for July 30, 1904.

BUSINESS PREMISES, LIVERPOOL.—The new offices of Messrs. Elder, Dempster, & Co., in Liverpool, are now nearing completion. The principal dimensions are as follows:—Water-front, 31 ft. 6 in.; Tower-gardens, 203 ft. 6 in.; Old Church-yard, 74 ft. 6 in. The area of ground covered is over 1,800 sq. yds. The class of stone used is principally Cefn. The

base of the building is in polished red granite, two pillars of which material support the main entrance. The whole of the Tower-gardens elevation is faced with white porcelain enamel brick, as also are the sides of the well and of the central light and air space over the seven domes, which surmount the general office in the centre of the ground floor. There are seven floors in all, connected by two stone staircases. There are also three high-speed electric passenger elevators now being fitted. The floors are in mosaic and wood block, the whole of the basement, ground, mezzanine, and first floors are of fireproof construction. The main entrance and other parts of the building will be lined with marble. The stairway and corridor walls generally are tiled. The whole of the edifices is lighted electrically, and warmed by means of low-pressure hot water and fires. Three boilers, situated in the basement, supply the power for this. For the design of the work Messrs. Briggs & Wolstenholme, F. B. Hobbs, and Arnold Thornley, Liverpool, are responsible.

PROPOSED NEW TOWN HALL, WYCOMBE.—The Town Council of Wycombe, having applied to the Local Government Board for approval to the borrowing of a sum of 3,038*l*. to defray expenditure in excess of the amount already authorized to be borrowed in respect of the new town hall, Colonel W. R. Slacks, R.E., Local Government Board Inspector, attended at the Guildhall a short time ago to conduct an inquiry into the application. Amongst those present were Messrs. Rushbrooke (Borough Surveyor), Bateman (architect), Silk (quantity surveyor), and Fishburn (clerk of the works for the town hall). The Town Clerk stated that a loan of 10,800*l*. had already been granted for the town hall, being 9,500*l*, the estimated cost of the building; 500*l*, architects' fees; and 800*l*, cost of land. Mr. Bateman, architect, gave evidence in relation to the building of the town hall, explaining that the tender of Messrs. C. H. Hunt & Son, of Wycombe, being the lowest, was accepted at 10,573*l*. The sum of 400*l*. was allowed for contingencies. Other details were explained by Mr. Bateman, who produced plans and documents for furnishing particulars to the Inspector.

PRIMITIVE METHODIST CHAPEL, MORPETH.—A new Primitive Methodist church in Howard-terrace, Morpeth, was opened a few days ago. Taking advantage of a rapid slope in the site from the street level southward to the Cotting Burn, the architect, Mr. J. W. Taylor, Newcastle, has provided on the ground floor a hall, classrooms, parlours, and kitchen, and above these, on the first floor, a church with vestry, etc., which are approached by a flight of steps from the streets. The building is Perpendicular in style, and the structure has been executed by Mr. T. A. Turnbull, Rowlands Gill.

MEMORIAL SCHOOLS, LEWISHAM.—The foundation-stone of the schools to be erected in Hither Green-lane, Lewisham, to the memory of the Rev. Walford Green, D.D., was laid recently. The site adjoins the Wesleyan Church, to which the schools, when completed, will form an addition. The hall, which will measure 54 ft. by 45 ft., will have provision for twenty classrooms, and an infants' room is to be 30 ft. by 24 ft. There will also be a room for the secretary, a library, and other accommodation. Messrs. Spalding & Spalding were the architects for the work.

SCHOOLS, GRESFORD.—The buildings used as a girls' and infants' school at Gresford having been recently condemned by the Board of Education and the local education authority, the managers have decided to erect schools upon a new site in accordance with plans drawn up by Mr. Morison, architect, of Wrexham. The tender of Mr. A. K. Simmons, of Gwersyllt, amounting to 2,027*l*., has been accepted for the carrying out of the work.

MARKET EXTENSION, BRADFORD.—The market extension in Rawson-square was opened on the 18th inst. The exterior of the new building, which is from designs by Messrs. T. C. Hope & Son, is built of stone, and is Italian Renaissance in style. It consists of a market hall, surrounded by ten shops, with frontages to Rawson-square, North-gate, and James-street, and a hotel. Domed towers, 84 ft. in height, mark the extremities of the North-gate elevation, and a third dome, hexagonal, and 60 ft. high, rises above the main entrance. The area of the market hall, covering which is a single-span roof of glass and iron, is 6,684 sq. ft., and the floor area of the shops and the hotel is 51,400 sq. ft. An entrance is provided to each frontage, with a wagon entrance from James-street, and a covered way communicating with the present meat and fish market. The cost of the extension, including 25,000*l*. for the site, is over 50,000*l*. Mr. Abner Rhodes was clerk of the works. The principal contractors have been Messrs. T. Obank & Sons, masons; J. E. Fearnley & Sons, joiners; A. Ross, plumber; Crabtree

& Berry, plasterers; W. H. & E. Walton, slaters; S. Parsons & Co., Ltd., ironwork; W. Blythe, hotel ornamental glass; Hellewell & Co., of Brighouse, market hall glass roof; Arthur Wear, painter; Collinson Brothers, and the Reliance Company, Ltd., for electric lifts; Sutcliffe Brothers, gates, lamps, and hotel balustrade; and Cordingley, mosaic flooring.

BRANCH LIBRARY, HULL.—The Hull Carnegie Branch Library, which is nearing completion, is situated in the West Park, adjoining the main entrance on the Anlaby-road. Briefly, it is a one-story building, set upon a mound. The interior is divided into two apartments. One of them is the lending library, and this is separated by an ornamental glass screen from the reading-room, which is panelled in oak, with open roof, and giving accommodation at the carved oaken benches for fifty-two readers. All the flooring is of pitch-pine blocks, and the artificial lighting is by electricity. This reading-room opens out upon a verandah, where the readers may take their books or magazines out into the open air. The architect is Mr. Hirst, the City Architect.

PROPOSED GOLF PAVILION, BULWELL.—The plans, prepared by Mr. F. B. Lewis, City Architect, Nottingham, for the new golf pavilion, which is to be erected in Bulwell Forest, have been approved by the Nottingham Public Parks Committee. The new building is to be of brickwork, with tiled roofs. A club-room, 33 ft. 6 in. by 18 ft. 6 in., is provided on the ground floor, together with a tea-room, 18 ft. by 15 ft., an apartment for hats and coats, two dressing-rooms, with accommodation for 472 lockers, bath, and lavatory, and a drying-closet. Accommodation for the caretaker, who will live on the premises, is also embodied in the scheme, and a basement is to be constructed which will be utilised as a store cellar. A small verandah, supported by iron columns, will be erected at the front of the pavilion, and the whole building will be heated by hot water and lighted by gas. The cost is estimated at 3,000l.

TRAMWAY OFFICES, SUNDERLAND.—New tramway offices and headquarters at Sunderland have just been erected at the Wheat Sheaf, Monkwearmouth. The front of the building is of Palaw facing bricks, with dressings of Dunhouse stone. The building has been designed and carried out, at a cost of about 6,000l., by Mr. F. E. Coates, the contractor being Mr. S. Warburton, Manchester.

POORHOUSE, DALZIEL.—Lord Hamilton of Dalziel formally opened the Dalziel new poorhouse recently. The building, which has been erected at a cost of 17,000l., is from the plans of Mr. Alexander Cullen, Motherwell.

BUILDING IN YORK.—A report of the Building Inspector to be submitted to the York Corporation at their next meeting shows that, during the past year, 240 dwelling-houses were approved and completed, 122 were approved and in course of erection, and 247 were approved and not commenced, a total of 609. The rentals of the completed houses vary from 10l. to 200l., the majority (fifty-eight) being 15l. houses. There were forty-eight with a rental of 14l., twenty-five of 12l., twenty of 17l., nineteen of 13l., eleven of 50l., and ten of 10l.

CHURCH, Huddersfield.—From plans prepared by Messrs. W. J. Morley & Son, architects, Bradford, a new Wesleyan church is to be erected at Crosland Moor, Huddersfield, at a cost, including the site, of about 4,500l.

THEATRE, COLCHESTER.—The new Grand Theatre at Colchester has just been opened. The building has been erected from designs prepared by Mr. J. W. Start, of Colchester.

MUNICIPAL OFFICES, CARLISLE.—The new Carlisle municipal offices in Fisher-street are now nearing completion. The work is being carried out from plans by, and under the supervision of, the City Surveyor, the contractors being Messrs. Gilbert Hill & Son. The sum borrowed to meet the cost of the purchase of the property was 5,500l., and of the alterations 1,000l.

STAINED GLASS AND DECORATION.

NEW WINDOWS, KILKENNY CATHEDRAL.—Two large lights, nearly 20 ft. high, in the south transept of Kilkenny Cathedral, have just been filled with Munich stained glass by Mayer & Co. They illustrate the texts, "I will give thee a crown of life," and "Her children arise up and call her blessed," and have been erected in memory of the late Dowager Marchioness of Ormonde.

VESTRY SCREEN, BERE REGIS.—A new oak vestry screen has been placed in the Church of St. John the Baptist, Bere Regis. It has been executed by Messrs. Harry Hems & Sons, of Exeter.

RESTORATION OF RUDD SCREEN, COMBER-IN-TEIGH-HEAD CHURCH, NEAR NEWTON ABBOT.—The old rudd screen in this church has just been restored according to the scheme of Mr. Robert

Medley Fulford. The work has been carried out by Messrs. Harry Hems & Sons, Exeter.

ST. NICOLAS CHURCH, EAST DAREHAM.—The Countess of Leicester unveiled, a few days ago, two large windows, one, the east, to the memory of Queen Victoria, and the other a memorial to the poet Cowper, who lies buried there, this being the 105th anniversary of his death. The window contains a full-length portrait of the poet, and illustrations from his works. Both windows were designed and executed by Messrs. Heaton, Butler, & Bayne.

ALL SAINTS', HASTINGS.—The lower portion of the east-end of this church has been decorated with paintings and polychromy by Messrs. Percy Bacon & Brothers, of London and Edinburgh. They have introduced figures of Bishops and other Saints of local interest, with adorning angels on the altar.

ST. JOHN'S CHURCH, HERNE BAY.—A two-light window was inaugurated on Easter morning by the vicar of the church. Each light contains the figure of a saint in a canopied niche, "St. Peter" and "St. James." Between the two lights is a brass, with heraldic bearings. The window and brass were executed by Messrs. Percy Bacon & Brothers.

APPOINTMENTS.

LEEDS.—At a meeting of the Sewerage Committee of the Leeds City Council, on the 18th inst., Mr. George Adam Hart, Chief Assistant Engineer to the Birmingham, Tame, and Rea Drainage Board, was recommended to the Council for the post of Sewerage Engineer to the Corporation, at a salary of 1,000l. a year. Of the original sixty-nine applicants the number was first reduced to thirty-one, then to twelve, who were interviewed by the committee, and, in the end, a selection of three was made, from whom the final choice was taken. These three gentlemen, whose claims were considered at the meeting of the committee, were Mr. George Adam Hart; Mr. Joseph Garfield, Sewerage Engineer to the Bradford Corporation; and Mr. Alfred Fidler, Borough Engineer at Northampton.

SANITARY AND ENGINEERING NEWS.

THE IMPROVEMENT OF THE HUMBER.—At the request of the Humber Conservancy Commissioners, Mr. G. N. Abernethy, C.E., and Mr. W. H. Wheeler, C.E., have prepared a report upon the condition of the river Humber and the means that should be taken to improve it. After dealing geographically with the waterway, and referring to the works of dock construction, which have already formed a line of river wall four miles in extent, the report states that there has been very little variation in the deep-water channels of the lower part of the river during the twenty-six years.

The engineers point out that the shoal in the navigable channel near the White Booth-road has been gradually increasing in height and in length, and they estimate that about 3,000 ft. require dredging in order to bring the shoal into conformity with the other part of the deep-water channel up to Hull. About 12,230 cubic yds. of material would have to be removed, at a cost of 56,194l. They point out that it would be of advantage to dredge the north side of the channel (so as to bring the deeper water close to the entrance of the Alexandra Dock) to a depth sufficient to give 14 ft. at low water. In order to do so 1,750,000 cubic yds. of material would have to be removed, at a cost of 87,500l. They further consider that a deep-water channel should be maintained on the north side of the river for some distance above Hull, at a cost of between 25,000l. and 30,000l. Mention is also made of the construction of a training wall towards Paul from the easternmost part of the wall of the proposed joint dock, and the cost of this is estimated at 59,777l. *Yorkshire Post.*

SEWAGE WORKS, DUMFRIES.—The drainage and sewage purification works, undertaken by the Town Councils of Dumfries and Maxwelltown, following upon an inquiry regarding the pollution of the river Nith, held in May, 1902, have been completed. The towns being divided by the river, it was considered impracticable to carry out a joint purification scheme, and independent schemes on the same lines were furnished by Mr. W. Allan Carter, C.E., Edinburgh. That for Dumfries has been completed at a total cost of about 40,000l., and is now in operation. The Maxwelltown works will not be in operation for several weeks yet. Their cost approximates to 26,000l. The system of purification adopted is the bacterial. The river is subject to tidal action, which renders the filter-beds inoperative for two periods each day owing to their low level. During these periods the effluent from the

septic tank is diverted by an automatic arrangement of air-dome and valves into a contact bed containing a thick layer of gravel, and is there stored until the tide recedes. The septic tank measures 150 ft. by 76 ft., and is 18 ft. in depth, and has a capacity of a million and a half gallons. It is formed of concrete, the roof being supported on brick pier carrying steel girders. The Maxwelltown works are situated almost directly opposite on the lands of Troqueurholm, of which 2 acres were purchased for the purpose. The septic tank here measures 150 ft. by 40 ft., and is 8 ft. deep.

LOUGH NEAGH DRAINAGE SCHEME.—It is announced that Sir Alexander Binnie has been appointed by the Irish Office, on the nomination of the Lord Lieutenant, to make further inquiry into, and to report upon, the proposed drainage of Lough Neagh and the River Bann.

BRIDGE, HOWTOWN.—The new Howtown bridge over the River Naim was opened recently. Mr. Cram, County Surveyor, was engineer of the work, and Mr. McKenzie was contractor. The new bridge is a steel-girder structure of two spans of 56 ft. each, the roadway being 20 ft. wide and having a level of 7 ft. above that of the old bridge. It replaces the old wooden bridge, which was erected in 1858, and has been built by the Town Council at a cost of 2,800l.

THE ROYAL SANITARY INSTITUTE.—At an examination in Sanitary Science as applied to Buildings and Public Works, held in Liverpool, April 14 and 15, 15 candidates presented themselves, to whom a certificate was granted:—Mr. E. M. Longdon (Bakewell).

BRIDGE, KINCLAVEN, N.B.—The new bridge over the Tay at Kinclaven was opened on the 22nd inst. The structure is built of red sandstone from Keith Quarry. It has six arches, each 61 ft. span, and five piers 6 ft. wide. The abutment on the Melkour side measures 34 ft., and that on the Kinclaven side measures 32 ft., a total length of 462 ft. The roadway is 16 ft. wide. The foundation piers, which pierce a bed of solid gravel to a depth of 14 ft., are of American rock elm. The piers are square, with outwaters, and shaped like rings are cemented blocks made on the spot.

The parapet is of blocked ashlar, and is 3 ft. 8 in. high. The whole fabric is filled with concrete to within a foot of the roadway. The gradient over two arches on either side is 1 in 30, and 1 in 60 towards the middle of the bridge. The top of the parapet, at the highest level, is nearly 30 ft. above ordinary water level. The total cost of the undertaking, including the new roadway on the Kinclaven side, but excluding the greater part of the new roadway on the Blairgrove side, is 7,300. The bridge has been built by Messrs. James Young & Sons, Ltd., Glasgow, from plans prepared by Mr. J. E. Harrow, M.Inst.C.E., of Messrs. Formans & McCall, Glasgow. The work has been carried out under the supervision of Messrs. Young's representative, Mr. James Rust.

FOREIGN.

FRANCE.—M. Carolus-Duran having been elected director of the French School at Rome, it will shortly be necessary to elect a successor to him as President of the New Salon. The names of MM. Rodin, Boudry, Carrière, and Roll are mentioned as among probable candidates. In accordance with the provisions of a legacy left by M. Maurice Delarue, the Société Centrale des Architectes has founded a biennial prize, which will be awarded this year for the first time, for an approved piece of civil or religious architecture by an architect who is a Frenchman. The prize is named after the late M. Maurice Delarue, for an illustration of a monument of French architecture, will also be awarded of this year. The Municipal Council of Paris has under consideration for the formation of a "Palais des Sports et d'Agriculture," either by a re-erection of the Galerie des Machines or in a new building. The proposed site is between the fortifications, l'Amirauté and Courbevoie, and the Portes d'Amirauté and Courbevoie. It is proposed to erect to the left of the Avenue de la République, in the Bois de Boulogne, in the centre of a planted lawn, a bared by the Moncel representing Alfred de Musset in the midst of an allegorical group symbols of the principal works. Several members of the Paris Council have brought forward a proposal for founding a new room at the Petit Palais to contain the casts after death (masques mortuaires) of the features of celebrated men, such as Pascal, Beethoven, Newton, Goethe, Napoleon, Victor Hugo, Lamartine, Gambetta, etc. The casts are to be carried on in the Place de la Bastille, and brought to light the foot of the wall of the ancient fortress, which will be utilised to a

extent as the foundations of a metro-
politan railway station at that point. An in-
teresting relic of Winchester is in danger of
being demolished—an old Tudor timber tenement
in Cheshill-street, which has come into the
market in consequence of the death of the
owner. The house is one of the very few left
of the Tudor time. Over the door is a state-
ment that it was long the Rectory house of
the ancient Soke parish of St. Peter's Cheshill
family, one of whom was Recorder of Win-
chester, and became Lord Chief Justice. The
house has had a most interesting history, and
steps are being taken to try and get it pre-
served.—*Daily Graphic*.

LIVERPOOL SCHOOL OF ARCHITECTURE.—The
ordinary meeting of the Liverpool Education
Committee was held on the 19th inst.
at the Municipal offices, Mr. J. W.
Alsop, deputy-chairman, presiding. The
Technical Education Sub-Committee recom-
mended that the City Council be asked to
establish a municipal school of art, and that
the School of Art of the Liverpool Institute
be used for the purpose. The recommendation
was approved. It was also recommended by
the Committee that the Education Committee
take over the assets and liabilities of the
School of Architecture and Applied Arts as
from May 21 next.—Mr. B. W. Ellis opposed
the latter recommendation. He said that the
school had been unsuccessfully and extrava-
gantly managed. At present there was a debt
of about 500*l.*, and by the end of the season
this would be about 700*l.* The students only
numbered 135, and the annual cost was 2,000*l.*
As compared with this, the School of Art, in
Mount-street, with 357 pupils, only cost 200*l.*
more. The history of the school did not justify
the committee in taking over the liabilities.—
Alderman Willink pointed out that, if the
liabilities were not taken over, they would
have to be borne by the individual members
of the committee of management. The work
of the school was separate and quite different
from the work of the School of Art, and it
was more costly of necessity. On May 21
the liabilities would be 307*l.*, and this
would be balanced by the value of the other
assets—models, furniture, casts, and so on.—
Answering Alderman Williams, Alderman
Willink said a scheme had already been
adopted by the committee to work the School
of Art and the School of Architecture and
Applied Art as one institution. The recom-
mendation was adopted with two dissentients.

A HINT TO ARCHITECTS.—Plans for twenty
houses in Londonderry-road, one house in
Cambridge-street, three in Bishopsgate, and
eleven in Dixon-street, were approved at the
meeting of the Stockton Urban Council on the
19th inst. Alderman Hill, Chairman of the
Plans Committee, said they had regulations
that plans should be marked with the points
of the compass, and that the size of the
rooms, and the yard areas, and other particu-
lars should be shown. Recently, many archi-
tects had been very lax in this matter, and, at
the meeting that morning, owing to the
absence of the Inspector in several cases,
instructions were given that the architects were
to be informed that the plans would be re-
jected unless the particulars were supplied.
These had since been given, but he hoped the
architects would not cause the committee any
further trouble in the matter.—*Darlington
Star*.

THE INTERNATIONAL FIRE SERVICE COUNCIL.—
The International Fire Service Council, which
was founded in 1900, and represents the in-
terests of the world's various fire brigade and
fire-preventive societies, with a total member-
ship of over 5,000,000, had its annual executive
meeting at Brussels on April 17 and 18.
Colonel Sæxtus Meyer, late Danish Royal
Engineers, was in the chair, supported by the
vice-presidents, Chief Officer Westphalen, late
District Surveyor of Hamburg, and Mr.
Edwin O. Sachs, of the British Fire-Prevention
Committee, London. Matters relating to fire
prevention and building construction had con-
siderable attention, to such an extent, in
fact, that a special standing committee of the
Council has been appointed to deal with the
subject, comprising:—Chief Officer Dittman
(Bremen), Mr. Ellis Marsland, District Sur-
veyor (London), Building Councillor Moder-
sohn (Unna), Mr. Sachs (London), and Pro-
fessor Woolson, Columbia University (New
York). The Council are issuing a technical
dictionary (French, English, German) of terms
relating to fire-resisting construction and fire
brigade work which should be of service to
the professions concerned. The Council's in-
quiry office at Luxembourg is now open, and
technical questions can be addressed there
through any of the three British Societies re-
presented on the Council. Arrangements have
been made to avoid clashing of congress
subjects, and the congress publications of all
countries will, in future, be on uniform lines.

CAPITAL AND LABOUR.

BUILDING TRADE, SUNDERLAND.—In connexion
with the dispute in the building trade, a meet-
ing was held on the 20th inst. in Sunderland
of the men interested, and, as a result of the
deliberations, which were conducted in
private, it is understood that the men are not
likely to submit to the terms of the masters,
and unless they are considerably modified the
men will come out on strike.

**BUILDING TRADE DISPUTE, NEWCASTLE AND
DISTRICT.**—A mass meeting of members of the
Newcastle district of the Operative Brick-
layers' Society was held, on the 20th inst., in
the Co-operative Hall, Darn Crook, Newcastle.
The object of the meeting was to hear the
result of the conference between the masters
and the delegates of the men, and to consider
the proposals made. What the masters re-
quire in the case of the bricklayers seems to
be pretty much what they propose to the plas-
terers, masons, and joiners. There is, to
begin with, the demand for a reduction of
wages one penny per hour. As in the case of
the other grades, this proposal, while it is a
vital one to the men—as will be judged when
it is stated that it means a reduction of 4s. 2d.
per week on a fifty hours' shift—is not the
only one of importance, in that there are
certain modifications of rules desired. One of
the most important—if not the principal—
of these is that which relates to the employment
of apprentices. Now it is the custom for the
bricklayers to have from one to four appren-
tices and no more on any job. This rule the
masters want to erase, and to stipulate that
there shall be no limit to the number of ap-
prentices. Then, as to working hours, the
masters' proposal is something similar to that
offered to the plasterers, whereby, in winter,
they want the short time to last for four
months instead of twelve weeks as at present.
They desire the men to begin at eight o'clock,
and work right through, without the breakfast
half-hour. The overtime proposals of the
masters are also similar to those suggested to
other grades, and where time and a quarter is
now paid for the first two hours, and after
that time and a half, the masters desire that
time and a quarter shall be paid for the first
four hours, and afterwards time and a half
shall come into force for shift work. The pro-
posal of arbitration in case of disputes is
also offered to the bricklayers. As a result
of the discussion, the men have rejected all
the masters' suggestions, and the gravity of
the situation is thus seen, for the notices of the
men are due to expire on May 1. The men in
Newcastle are to test the feeling of the men
affected in other parts of the district, and for
this purpose a meeting of delegates from Sun-
derland, North Shields, Jarrow, Blyth, and
Newcastle is to be held. The members of the
Newcastle district of the Operative Society of
Plasterers have received the reply of the
masters to their counter proposals. Its nature
is unfavourable.—*Newcastle Chronicle*.

NOTTINGHAM BUILDING TRADE DISPUTE.—As
the result of a conference between representa-
tives of the various societies affected, and
delegates from the Master Builders' Associa-
tion, one point may practically be said to
have been eliminated from the dispute in the
Nottingham building trade. This was the
demand by the employers for uniform working
hours. An arrangement has been come to
agreeing to this request, and, although it has
to be sanctioned by the general body of
masters and men, it is not considered probable
that any objection will be raised. By the new
arrangement there would not be such diverse
times of starting work in the winter, and
another suggestion is that work should cease
at five o'clock. With regard to conferences
on the other points, no steps have, as yet,
been taken by either side.

EDINBURGH JOINERS' STRIKE.—Another meet-
ing of the operative joiners, at present on
strike in Edinburgh, was held on the 21st inst.
in St. Cuthbert's Hall, King's Stables-road.
Mr. John Lawson presided over a large atten-
dance, and it was reported that another master
had signed the by-laws. There is no sign of
yielding on the part of the men, who are
standing firmly together.—*Scotsman*.

GLASGOW JOINERS TO STRIKE.—A mass meet-
ing of the joiners of Glasgow and district was
held in the Wellington Palace, Glasgow, on
the 21st inst., to receive the replies of the
masters to the by-laws sent out by the men's
organisation. These by-laws lay down work-
ing conditions similar to those which have
prevailed during the past twelve months, while
the Master Joiners' Association, on the con-
trary, desire to reduce the men's wages by a
penny per hour. There are between 3,000 and
4,000 members of the two joiners' trade
unions in the district. It was unanimously
agreed not to entertain the suggestion of a
strike. It was further agreed, in view of the
fact that the Master Joiners' Association only

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.
By E. A. Victor, architect, has removed
offices from 14, Sackville-street to 161, New
Street, W.

WOOD FROM COLUMBIA.—The forests of
Columbia, according to an official re-
view which has reached the British Foreign
Office, contain considerable quantities of
various cedar, etc., of good quality, and
many attempts at exportation have been
made, but with little success, owing chiefly
to high rates of ocean transport. A saw-
mill in the forest thirty miles from
Santa Maria, and four miles from the railway
supplies the local demand for lumber
of mahogany, and sends its surplus to
Buenos Aires, where the consumption is large.

INCORPORATED CHURCH-BUILDING SOCIETY.
The Society held its usual monthly meeting
Thursday, the 20th inst., at 7, Dean's-yard,
minster Abbey, S.W., the Rev. Canon
Norman in the chair. Grants of money
made in aid of the following objects:
—Building a new church at Newcastle-
-lyne, St. Paul, Staffs, 175*l.*, and to
enlarging or otherwise improving the
accommodation in the churches at Cily-cwm,
Michael, near Llandovery, Carm, 25*l.*;
King Magna, All Saints, near Lutterworth,
and Richmond, St. John the Divine,
New, 55*l.*, in lieu of a former grant of 40*l.*
The were also made from the Special
Buildings Fund towards building
new churches at Hackett, St. Paul, near
Bury, Glos, 20*l.*; Jameston, near Manor-
-Pemb, 10*l.*; and Willsil, near Pateley
-York, 30*l.* The following grants
were paid for works completed:—Cwm-
-Hall, St. Margaret, near Swansea, 100*l.*;
St. All Saints, 125*l.*; Eastbourne, St.
-p, 125*l.*, on account of a grant of 200*l.*;
-ing, St. Bartholomew, 125*l.*; Hopwood,
-John the Evangelist, near Manchester, 75*l.*;
-law, St. John the Baptist, Devon, 55*l.*;
-St. Thomas, near Sheffield, 20*l.*;
-St. Michael, St. Colchester, 10*l.*;
-St. John, 40*l.*; and Abertillery, St. John, Mon.,
10*l.*. In addition to this the sum of 760*l.* was
granted towards the repairs of thirty-three
churches from trust funds held by the Society.
The Society likewise accepted the trust of a
sum of money as a repair fund for Christ
-Spitalfields. The Annual General
-meeting of this Society will be held on Thurs-
-day, May 4, at the Church House, Dean's-yard,
minster, at 3 p.m., when the chair will
be taken by the Lord Bishop of St. Albans.

TECHNICAL INSTITUTE AT STOURBRIDGE.—An
industrial exhibition in a new Tech-
-nical Institute at Stourbridge was opened on
the 24th inst. by Lady Cobham. The build-
-ing includes accommodation for a free library,

represented a small proportion of the employers, to treat with the masters individually. Up till the close of the meeting seventy signed copies of the by-laws had been received from masters agreeing to the men's terms. These represent over 1,000 men. It is stated, on behalf of the men, that a much larger number of acceptances would have been received but for the prospect of arbitration which the Lord Provost's action seemed to hold out.

ABERDEEN JOINERS.—The masters have sent to the men's society a communication embodying their ultimatum in the dispute existing between them and the operatives on the question of the by-laws. The masters propose to amend rule No. 4, so as to read as follows:—"Each employer agrees to pay three-fourths of his workmen 8d. per hour, and one-fourth not less than 7d. per hour." It is further stipulated that the other by-laws remain as at present for another year. The employers add that, considering the depressed state of trade, they think they have made a very fair and reasonable offer to settle the dispute.

Legal.

DISPUTE AS TO A PARTY-WALL.

THE hearing of the case of *Forbes v. Wallis & Co.* concluded before Mr. Justice Phillimore, sitting without a jury in the King's Bench Division, on the 19th inst.—an action by Miss Forbes, the freeholder of a house and premises known as Dunottar, Bedford Park, against the defendants, a firm of builders, and the freeholders of the adjoining property, Sydney House, for an injunction to restrain the defendants, their servants and agents, from interfering with the party-wall dividing the two properties, and for an order requiring the restoration of the party-wall which the defendants had pulled down. The plaintiff also claimed damages.

Mr. McCall, K.C., and Mr. Stewart appeared for the plaintiff, and Mr. Montague Shearman, K.C., and Mr. Singdon for the defendants.

Mr. McCall, in opening the plaintiff's case, said that his client complained of a very high-handed trespass. In 1886 both the properties in question belonged to a Mr. Berry. He conveyed Dunottar to a Mr. Orpen, retaining Sydney House himself. In 1901 the plaintiff purchased from Mr. Orpen the freehold of Dunottar. He (the counsel) submitted that at that time the wall in dispute either was the property of the plaintiff because it had not been expressly reserved, or it was a party-wall between the two owners. In 1903 Messrs. Wagstaff & Co. wrote to the plaintiff, on behalf of Mr. Berry, saying that the wall was the property of the plaintiff. In April, 1904, Mr. Berry conveyed the freehold of Sydney House to the defendants. In May, 1904, the plaintiff, having heard that alterations were contemplated on the Sydney House estate interfering with her property, wrote to the defendant. To this letter she received no answer. On June 2 Mr. Peter Dollar, plaintiff's architect, wrote to the defendants with regard to light and air questions, or as to any arches over it, and asked them to reconstruct, or otherwise support the chancel arch, the building being, in the opinion of the district surveyor, in a dangerous state. Mr. Redwood Davies, barrister, defended Mr. Collman stated that, in consequence of the report of the district surveyor that the structure was in a dangerous condition, a notice was served upon the owner on February 3 requiring him to carry out the work which the surveyor had certified as requiring to be done. The surveyor reported on February 27 that the building had been shored, but nothing else had been done; and, as matters were still in the same state on April 4, the Council wrote to the owner's surveyor, Mr. Collman, asking that the work should be carried out. A reply was returned to the effect that the delay was due to the difficulty of collecting the necessary money. Mr. Paul Taylor asked if it was a case in which the owner required further time. Mr. Davies replied that they were doing the work, but not quite as the Council wished. Collman said that all they wanted was that the work should be done. He was surprised that the case should be contested. He suggested an adjournment for three months, on the understanding that the work was put in hand and proceeded with as soon as possible. Mr. Davies remarked that they wished to have some guarantee that the Council would leave them alone, one of the orders of the Council was absolutely impossible for any surveyor. Mr. Paul Taylor adjourned the summons for three months to enable the surveyors on either side to come to terms, observing that the Council were very reasonable as a rule, and he did not think that they would require anything to be done that was impossible.—*Times*.

After evidence as to the plaintiff's title had been given, Mr. F. Baxendale, an Associate of the Surveyors' Institution, examined, said he was assistant to Mr. Peter Dollar. The witness gave evidence as to the encroachment of the footings of the new wall on to plaintiff's land, and as to the damage done to the plaintiff's trees, shrubs, and plants by the defendants' men in pushing down the wall.

Mr. Shearman, interposing, said he did not think there would be any question about the measurements. The defendants claimed this wall and the footings. He admitted that they trespassed on the plaintiff's land to push the wall down, but they had paid a sum into court which he thought would cover any damage.

Mr. McCall, continuing, said that, after the defendants had pushed down the old wall, they proceeded to build a new one, but on different lines from the old one. His case was that the new wall was on the footings of the old one, and that the footings of the new wall extended on to the plaintiff's land several inches beyond the old footings.

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Mr. Maurice Adams gave evidence also as to how far the footings of the old wall extended. At the close of the plaintiff's case, Mr. Shearman, for the defendants, submitted that the amount paid into court covered all the damage done by the trespass. With regard to the party-wall he contended that it was never meant to convey it to the plaintiff. In the event of its being held to be a party-wall, he contended that the defendants had the right to build up to the footings of the old wall, and that the wall was common to both parties.

Mr. Thos. Rogers Wagstaff, F.S.I., and Mr. Geo. Waime, a surveyor, gave evidence on behalf of the defendants to the effect that the whole of the new wall of the defendants', including the footings, was within the defendants' boundary.

Mr. R. T. Hayes, Building Inspector to the Acton Urban District Council, also gave evidence on behalf of the defendants.

Mr. E. H. Wallis, the defendant, a builder and contractor, gave evidence, and denied that there was any substantial trespass on the plaintiff's land. He claimed the wall as his, and maintained that he had only rebuilt the wall on the site of the old wall.

At the close of the evidence, and after some argument, it was agreed that the defendant should be allowed to erect the wall of his buildings on his own land, and 4½ in. off the site of the present wall, the land so left to be the plaintiff's land.

His lordship said that the only question remaining was that of damages.

After hearing Mr. McCall and Mr. Shearman on this question, his lordship, in giving judgment, said that as to the trespass the plaintiff had made out a good cause of complaint. He came to the conclusion that the wall was a party-wall, and that the defendants had no business to pull it down as they did or for the purposes for which they pulled it down. He agreed that defendants were tenants in common of the wall, but they had acted wrongfully in pulling it down. His lordship then referred to the agreement come to between the parties as to the building of the wall as set back, and said that, formally, he would grant an injunction restraining the defendants from keeping the wall up as it now stood. On the claim as to trespass his lordship awarded the plaintiff 70l. damages and the costs of the action.

Upon the application of the plaintiff's counsel his lordship reduced the damages to 60l., the defendants allowing the plaintiff to put trellis work on the wall up to 7 ft. and to train creepers thereon.

A DANGEROUS BUILDING.

AT Marylebone the owner of the structure, known as St. Benet and All Saints' Church, Lupton-street, Kentish Town, was summoned by Mr. John Collman, on behalf of the London County Council, for failing to comply with a notice to take down the south aisle and support and secure the nave, or to underpin and support the walls of the aisle, and reconstruct or otherwise support the flying arches over it, and also to take down, reconstruct, or otherwise support the chancel arch, the building being, in the opinion of the district surveyor, in a dangerous state. Mr. Redwood Davies, barrister, defended Mr. Collman stated that, in consequence of the report of the district surveyor that the structure was in a dangerous condition, a notice was served upon the owner on February 3 requiring him to carry out the work which the surveyor had certified as requiring to be done. The surveyor reported on February 27 that the building had been shored, but nothing else had been done; and, as matters were still in the same state on April 4, the Council wrote to the owner's surveyor, Mr. Collman, asking that the work should be carried out. A reply was returned to the effect that the delay was due to the difficulty of collecting the necessary money. Mr. Paul Taylor asked if it was a case in which the owner required further time. Mr. Davies replied that they were doing the work, but not quite as the Council wished. Collman said that all they wanted was that the work should be done. He was surprised that the case should be contested. He suggested an adjournment for three months, on the understanding that the work was put in hand and proceeded with as soon as possible. Mr. Davies remarked that they wished to have some guarantee that the Council would leave them alone, one of the orders of the Council was absolutely impossible for any surveyor. Mr. Paul Taylor adjourned the summons for three months to enable the surveyors on either side to come to terms, observing that the Council were very reasonable as a rule, and he did not think that they would require anything to be done that was impossible.—*Times*.

PATENTS OF THE WEEK

APPLICATIONS PUBLISHED.*

6,978 of 1904.—A. F. FITCH: *Machines for Testing the Strength of Materials*.

Machines for testing the strength of materials, consisting in the combination of two levers and shackles so arranged that the machine can be used as a single lever testing machine for light loads, or as a combined lever testing machine for heavy loads, hydraulic straining cylinders being used and mounted on trunnions, so that the cylinders can be swung into a convenient position for examination or removal of the hydraulic leathers or other packings employed.

7,141 of 1904.—H. HOFMEISTER: *System of Ventilation*.

A system of ventilating without creating draughts, by means of pivoted windows with a leaf inwardly inclinable, characterised in that above the pivoted leaf is arranged an air-chamber communicating with the outer air, and the pivoted window is opened, and is isolated from the interior of the room by a sifter or other similar device, and the lower air inlet whereof is regulated, when opening and closing the leaf, by a flap device furnished with a deflecting plate for the air and connected to the leaf of the window, which is guided between lateral brackets furnished at their inner edges with beading in order to obtain an absolutely tight closing, preventing direct entry of outer air and obliging it to always pass through the air-chamber for entry in the room.

7,465 of 1904.—A. ROBERTS and M. SYER: *Water-closet Seats and Means for Fixing the same*.

Water-closet seats, consisting of a board or flap to each side of which is fitted a Tiron or metal clamp pivoted at its rear end to a board or support fixed at right angles to a vertical board, secured to the wall of the room or place in which the water-closet is to be used, and projecting at the back to form hinges, the flap or seat being formed of one or more pieces.

7,757 of 1904.—E. LEACH and I. H. BREKLEY: *Apparatus for Heating Water for Baths and other purposes*.

An apparatus, whereby water at any desired temperature between cold and boiling point may be supplied to baths and for other purposes by the movement of one lever or handle, said apparatus consisting of a water valve and a steam valve in alignment, a rod extending from each of said valves and loosely connected centrally, a lever or handle fitted on the rod extending from the cold-water valve and operating by a partial movement said cold-water valve, and also the steam-water valve by the completion of the movement of said lever or handle, a mixing chamber which may have a perforated lining containing glass or other marbles, inlet apertures in said mixing chamber for the admission through the said valves of cold water and steam, an outlet therefrom for the passage of the hot water to a bath or elsewhere, and means for regulating the supply of cold water to the mixing chamber.

8,329 of 1904.—J. M. NICHOLLS: *Cowls or Ventilators Specially Applicable to Smoke Chimneys*.

This invention relates to cowls or ventilators specially applicable to smoky chimneys, and has for its object to prevent down draughts in chimneys, ventilating shafts, and the like, and consists in fixing over the top of the chimney or shaft an openwork cone or cylinder with longitudinal openings or flues. In carrying out this invention the openwork cone or cylinder may be made in metal or earthenware, and its base is fixed on the top of the chimney or shaft, the base of the cone or cylinder fitting within or outside the top of the shaft. The cone or cylinder may be made solid or built up, and the cone may be truncated at the top so that a sweeping brush can be passed up through the chimney or shaft and completely through the cone. The cone or cylinder may be double, the openwork part of the outer wall being opposite the solid part of the inner wall.

8,943 of 1904.—M. J. ADAMS: *Lavatory*. This invention consists in the combination of a lavatory with a trough, the lavatory being held up above the trough and partly resting thereon, the waste of the lavatory being directed into the trough, and the overflow of the basin also discharges directly into the trough.

* All these applications are in the stage of no objection to the grant of Patents upon them has been made.

11,684 of 1904.—F. SMITH: *Fastenings for Doors and the like.*

This invention relates to locks and bolts and doors and the like are required to be closed from the outside, but will open automatically from the inside when there is a pull brought against the door. When the doors it is usual to employ a top and bottom bolt worked by a double-action lever contrivance, but it has been found that it is possible to raise the bottom bolt from the outside of the door by inserting an actuator underneath the top. To prevent the spring catch is employed to engage the bottom bolt, and so prevent the bolt from being pulled out, but at the same time it allows the action of the falling cross-bar to release the bolt. An indicator is employed to show the bolt is properly shot and the catch in proper working order.

11,684 of 1904.—J. McVEAN: *Drain Scoops and the like.*

This invention relates to scoops for use in draining the sand and other solid sediment from drains, traps, and such like places, and is an improvement on the tool to simplify the process and the tool for use alternately; first as a scoop, and then as a scoop. In carrying out the invention a scoop bowl of any suitable size and shape for the purpose named is made and hinged to the end of a tube or tubular shaft. A rod projects from the bowl, and a rod is fitted telescopically within the bore of the first-named shaft, and connected by suitable devices to the said bowl. If the outer or inner shaft is pushed towards the bowl the latter is made, by means of a link or links, to turn on its hinge and sideways from the shafts somewhat in the direction of the letter L. If the inner shaft is pulled back again the bowl, actuated by a link or links, is moved on its hinge into position in line with the shaft. When the scoop form the scoop can be inserted into the drain and forced edgewise into the sediment. If the outer or hollow shaft is pulled firmly, the inner shaft pushed towards the bowl, the scoop acts as a lever and a portion of the solid matter from the drain. The two handles are then locked together, and the scoop can be withdrawn to the sediment.

11,684 of 1904.—C. SHOWELL: *Manufacture of Bolts.*

This invention relates to the manufacture of bolts, in which the barrel part and the head are made from one solid piece of metal, which the said barrel part is complete circular formation. In carrying out the invention a peculiar sectionally-shaped rod, consisting of a W-shape, is produced by rolling, extruding or drawing in the central parts are formed somewhat circular instead of angular shape, with two lower points so shaped that, in subsequent operation, they may be brought to form a close butt-joint. The outer flanges form the base plate. Such a rod is then passed through successive drawing, or the like operation until the part before-named is formed into a rod with its lower two parts firmly butting against each other in a solid manner, at the stage the two outer parts now lie in line with each other, and thus forms the flat bolt.

11,684 of 1904.—F. SMITH: *Casement and Fan-Openers.*

This invention is to construct a fan or fanlight opener so that only the wheel and plate and end of the screw are visible within the room, so as to prevent the hanging of the curtains or other dressings. The opener is constructed so that it can be applied to a casement or window working on hinges either at the top, bottom, or the sides, and it is also applicable to fanlights or casements working on a hollow shaft or spindle is formed. A rod is inserted through the frame or sash around to the outside of the frame, or by means of a crank-lever working on a rod in any suitable way. Inside this shaft or spindle a screw-thread is formed, or an ordinary screw-nut may be attached to the lever and inserted in the shaft or spindle, or in the screw-nut. At the front of which a pulley-wheel, or any other attachment is made, may be applied to work it on the frame—that is, on the inside of the room. By this means the pulley-block and the end of the screw-pin only project from the room. By working the pulley-wheel the like the hollow shaft is caused to revolve, and thus open or close the fanlight or casement.

11,686 of 1904.—F. WHITLEY: *The Joining of Seats for Pedestal Closets and the like.*

A method of joining together sections or pieces of wood to form seats or covers for pedestal closets and the like, comprising dovetailed or similar-shaped grooves cut or formed in the opposing edges of the sections, and a longitudinal joining strip or piece having its upper and under surfaces inclined or wedge-shaped, or diverging from a middle position to the outer edges to give a greater thickness at the said edges than in the middle, the grooves in adjacent sections, when brought together, forming an opening corresponding in shape to the shape of the strip in cross-section, and receiving the said strip edge, when driven home into the grooves, firmly secures the sections to each other.

13,417 of 1904.—J. GALLOWAY: *Apparatus Employed in Connection with Flushing Cisterns.*

This invention relates to apparatus employed in connection with flushing cisterns for water-closets, urinals, and other purposes, and has for its object that of making the working and flushing operations absolutely noiseless. This is carried into effect by providing the syphon pipe of the cistern with an air inlet which is controlled by means of a ball-valve operated by means of a ball-float, float, or valve and lever, the air inlet of which is regulated by the movement or fall of water in the cistern.

28,058 of 1904.—H. RECKNAGEL: *Spraying Devices for Lavatory Basins.*

This invention relates to spraying devices for lavatory basins. The apparatus, hitherto known for the purpose of washing the face by means of a continuously-flowing vertical ascending jet or jets of water, has the disadvantage that the used water mingles with the clean water. Apparatus in which this disadvantage is obviated by the use of a rose attached to a flexible tube have the disadvantage that one of the user's hands is required for holding the rose. According to this invention, two upwardly-directed, converging currents of water in the form of jets or sprays are used in such a manner that they co-mingle to a greater or less extent and thus form a kind of "ridge" of water into which the user can plunge his face while retaining the free use of both hands, so that the face can be completely washed with the aid of the latter, without altering the adjustment of the nozzles, roses, or sprays by which the water is emitted.

18,618 of 1904.—T. A. WOOLDRIDGE and E. A. WARD: *A Tool or Appliance for Cleaning, Scraping, or Removing Obstructions from Drains and other Pipes and Tubes.*

A tool or appliance for use in cleaning, scraping, or removing obstructions from drains and other pipes and passages, consisting of a body part made from closely-coiled spring wire and a flexible leading end, pilot, or nose-piece, which is either formed integral or in one piece with the body coil, or is separate and attached thereto.

9,694 of 1904.—J. STODDART T. STODDART: *Construction of Fountains.*

This invention relates to means for making a fountain work automatically by springs or weights. The fountain works by a piston with a hollow rod, the piston acting as a valve. The hollow rod is pierced where it is fixed on top of the piston, to allow the water to pass up the rod. The piston is enclosed in a cylinder with holes at the bottom of cylinder, to receive water, and a hole at the top to allow the rod to pass up through. The piston is lifted up by a spring and pressed down by hand, or levers. When the piston is pressed down the cylinder fills with water. The spring lifts the piston up and the piston forces the water up the hollow rod, and out of a nozzle at the top of the rod.

11,140 of 1904.—A. B. GEEN: *Railway Bridges and the like Structures.*

This invention relates to railway bridges and structures for carrying overhead travelling cranes supporting rails for wheeled carriages and the like, and has for its objects to effect a saving of time and labour in erection, and to realise economy and an increase of strength. According to the present practice, in the construction of short-span railway bridges, a line of rolled steel joist is arranged under each line of rails, the rails being carried upon transverse sleepers secured to the joists by hook-bolts, and the rails being secured to the sleepers by dog-spikes or the like. In this invention, however, the rail and joist are rolled in one piece. The joist is erected as part of the structure of the bridge in the usual way, the head and the web of the rail being integral with the joist and presented uppermost. When the joists have been fitted, the rail track is already laid, the joists being erected

in such position that the rail-forming portions are in line with and form a continuation of the rails leading up to the bridge. No sleepers, hook-bolts, washers, or dog-spikes are required.

27,737 of 1903.—F. M. McLARTY: *Means or Apparatus for Use in Cutting or Dressing Stone, Metal, or like Materials.*

A cutter made of a thin cutting disc, or thin cutting discs, which is, or are maintained rigid by being confined between spacing or distance pieces, said pieces having in their peripheral grooves or spaces and the said discs being mounted so as to be rotatable, or carried upon a support capable of rotating, means provided by which lubricant can be applied to the parts moving in contact with each other.

9,680 of 1904.—H. H. LAKE (Jenquel-Hayn): *Manufacture of Building Materials, Heat-insulating Materials, and the like.*

A process of manufacturing building and insulating materials which consists in burning mixtures formed of kieselguhr, clay, and vegetable filling materials, and in which there is used as binding means silicated magnesia obtained by precipitation from magnesium salt solution, and hydrated silica acid added separately to, or produced in, the mixture.

11,056 of 1904.—A. B. LUNDBERG and G. C. LUNDBERG: *Ceiling or Wall Rosettes for Electric Lighting and Heating.*

Ceiling or wall rosettes for electric lighting and heating, consisting in the combination and arrangement of three contact plates, each with a terminal for leading wires, and others for attachment of flexible wires, also contact tubes or the like for producing the various adaptations, and comprising a method of tapping current from or feeding current to a rosette, by means of a detachable connexion, which may be of any suitable type, two-pin, concentric, single-pin, or the like.

11,539 of 1904.—B. G. WILMER and A. W. BOND: *Open Grate or Fireplace.*

This invention relates to an open grate or fireplace. In carrying this invention into effect the grate or firegrate has a grate bottom, preferably located in a sinking or recess in a hearth formed of cement or tiles, with a back and two sides formed of slabs of fireclay closely fitting and cemented together. Above the three slabs above-mentioned, and closely fitting thereon, is a block of fireclay, the back portion of which inclines forward at the upper end, where it is shaped to receive a metal flue to convey the products of combustion into the chimney; the sides also are shaped so as to meet the forwardly-inclined back. The upper part of this block of fireclay is also so shaped (preferably semi-circular) to act, in conjunction with the metal flue, as a support for the rear ends of the headers of a brick arch supported on piers, one on each side of the stove or fireplace. The metal flue is preferably made of cast-iron in the form of an oval (or circular) tube in cross-section, the front portion thereof resting in the block of fireclay being in a horizontal position, and the rear portion thereof curving upwards preferably in a segment of a circle. This rear portion is preferably of round section, upon which rests another curved tube or swan-neck of suitable material forming a trap and effectually preventing down draught.

4,965 of 1904.—G. A. PHILLIPS and W. H. BAGLEY: *Furniture Castors.*

A furniture castor, consisting in the combination of a socket fixed in or adapted to fit in a tubular leg, said socket having a flange or washer at the bottom forming a bearing for the axis of the hornpiece, and also having a top bearing for said axis and a combined hornpiece and hollow axis formed of a sheet metal blank, and adapted to fit and turn in said socket, said hollow axis having a side tongue adapted to engage over the flange or washer of the socket to secure the combined hollow axis and hornpiece therein, said tongue projecting below the socket and adapted to be pushed inwardly to release the combined hollow axis and hornpiece from the socket.

12,062 of 1904.—R. SHARP: *Window Sashes.*

A window sash having divided styles, the inner halves of the styles being pivoted to the outer halves, and one-half of the style having a longitudinal recess, in which is situated a bar or strip adapted to be forced into engagement with a comparatively shallow longitudinal recess in the other half of the style by any convenient means when the two halves of the style coincide.

12,296 of 1904.—J. T. M. BURGERS: *Window-sash Wedge and Lifter.*

This invention consists of a plate at whose forward end the sides are shaped and then turned up so as to form a wedge upon each side. At the other end of the plate the metal is turned

0 | *Secrets of Africa*.—Mr. Bartlett.
0 | Excavations in Rome. 8 p.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Design by Deane
Reconstruction of City Hall, Perth (Cost, 6,000 <i>l.</i>) ..	Perth Town Council,	30, 2 <i>l.</i> and 10 guineas	Aug.
Erecting a City Hall (Cost, 15,000 <i>l.</i>)	do.	50, 30, and 20 guineas	

CONTRACTS.

Nature of Work or Material.	By whom Advertised.	Forms of Tender, etc., supplied by.	Tenders to be Delivered
Cement Plastering, etc., Modbury Reservoir	Modbury Parish Council.	White Hart Hotel, Modbury	April 30
Roads, etc. (Queen's-grove-road, etc.)	Chingford U.D.C.	W. Stair, Surveyor, 84, Station House, Chingford	April 30
Alterations, Hexham Police-station, etc.	Northumberland C.C.	J. A. Bean, County Surveyor, Moot Hall, Newcastle-upon-Tyne	May 1
1,000 tons of Portland Cement	County Town Council	S. C. Chapman, Water Engineer, Tonkay	May 1
Wood-Paving Works	Royal Borough of Kensington	F. Weaver, Borough Eng. and Surveyor, Town Hall, Kensington	May 1
Seavenging and Team Work	Mountain Ash U.D.C.	W. G. Thoms, Engineer, Public Offices, Mountain Ash	May 1
200 tons of Laid, Limestone	do.	J. Whitak, Architect, Elgin	May 1
Cutting Trees, Levelling, Trenching, etc.	do.	do.	May 1
Tool House, Spynce Churchyard	do.	do.	May 1
1,000 tons of Dry Sand Cast-Iron Pipes, etc.	do.	do.	May 1
250 tons of Dry Sand Cast-Iron Pipes	Lanarkshire Middle Ward Dis. Com.	J. & A. Leslie & Reid, C.E., 72, George-street, Edinburgh	May 1
Road Materials	do.	do.	May 1
Alterations at Guildhall, Windsor	Stockbridge U.D.C.	J. Marsden, Clerk, Council Offices, Stockbridge	May 1
Baptist Chapel and School-room, Bridgend	New Windsor Town Council	Borough Engineer, Alma-road, Windsor	May 1
Road, 25 Surface-water Drains, Gelly Df Isaf Estate	do.	F. J. Thomas, Engineer, Town Hall, Woking	May 1
Alters. adds to Choir Gallery, Wes. Ch., Wimborne	Commissioners of the North Lighthouses	I. Jones & T. E. Richards, Archts. & Survs., 15, St. Peter's Church, Wimborne	May 1
Timber and Concrete Pier, etc., Oban	do.	At the Vestry, Wimborne	May 1
Four Houses, etc., in Healds-road, Dewsbury Moor	do.	D. A. Stevenson, Engineer, 84, George-street, Edinburgh	May 1
Two Houses and Shop, Belling, Harley-street, Dewsbury	do.	J. Barton & Son, Architects and Surveyors, Halifax-cd., Dewsbury	May 1
Roof of Dewsbury Police-station, Industrial Soc. Warehouse	do.	do.	May 1
500 tons of Portland Cement	Hastings Corporation	Holton & Fox, Architects, Corporation-street, Dewsbury	May 1
Making-up Hollingbourne Gardens	Easing Town Council	C. H. Palmer, Borough Engineer, Town Hall, Hastings	May 1
Expanding Machinery	Swinton U.D.C.	C. Jones, Borough Engineer, Town Hall, Wigan	May 1
Supplies	Gl. Crosby U.D.C.	R. Fowler, Engineer, Council Offices, College-road, Gl. Crosby	May 1
Brick Wall, Lyndhurst-road and Ham-road	Working Corporation	W. Hall, C.E., Surveyor, Council Offices, College-road, Gl. Crosby	May 1
Farm Buildings, Bridlington	Mr. J. H. Hutchinson's Trust	Borough Surveyor, Liverpool-road, Worthing	May 1
Wire Lift Types, etc., at Chelmsford, Leytonstone	Ashton-under-Lyne Hospital Board	J. Lowe, Surveyor, Town Hall, Ashton-under-Lyne	May 1
Stonework, Buildwas Bridge	West Ham Guardians	F. E. Hilleary, Clerk, Union Workhouse, Leytonstone, E.	May 3
Waterworks, Whitehead	Saunders & Sons, Ltd.	A. T. Davis, County Surveyor, Shirehall, Shrewsbury	May 3
Sewerage Tanks at Brynm	Mr. H. B. Raphael	G. E. Morris, Surveyor and Engineer, 15, St. Peter's Church, Woking	May 3
New Road, Doverside	Cowbridge R.D.C.	Clerk of Works Office, St. Donalds Castle, Llantwit-Major	May 3
Alterations to premises, 16, Fore-street, Tiverton	Miss Wilson and Mr. Postlethwaite	W. Barrows, Deepway, Tiverton	May 3
Two Villas at Seascale, Cumberland	Wood Green U.D.C.	Huddart, Architect, 9, Lower-chamber, Wood Green	May 3
Disinfectants	Fulham Borough Council	A. E. Adams, Sanitary Inspector, Town Hall, Wood Green	May 3
Condensation Plant and River Work	do.	Borough Engineer, Town Hall, Fulham, S.W.	May 3
Steel Roof and Bunker Work	do.	do.	May 3
Coal-Conveying Apparatus	Whiston R.D.C.	J. Harris & Son, Jewry-chamber, Winchester	May 4
Road, St. Mary's Estate, Winchester	Stirling Comatation Hospital Com.	G. S. Fraser, Dolphin-lane, Whiston	May 4
Scavenging, Blandford	Mr. G. Robson	A. H. Goudie, Burgh-buildings, Birling	May 4
Smallpox Hospital, Lower Tiverton	Southampton Corporation	F. M. Howell, Jnr., Architects, Alnwick	May 4
Pair of Houses, Glendale-road, Wooler	do.	H. F. Street, Borough Engineer, Chingford, Southamton	May 4
100 tons of 7-in. Girdler Rails	Berks Standing Joint Committee	C. R. Petty, Architect, 12, Waterhouse-street, Halifax	May 4
Reconstruction of the Victoria-road	St. George-in-the-East Guardians	J. Mead, Esq., Surveyor, Broadway-house, Halifax	May 4
Villa Residence, Walls, etc., Barksland	Somerset C.C.	Clerk's Office, Ranges, 10, St. Andrew's-lane, E.	May 6
Section of Police-station, Maldenhead	Newton-in-Makerfield U.D.C.	Mr. F. Bird, Architect, Midsumor Norton, Somerset	May 6
Painting, etc., at Schools, Upton Park	Rt. Hon. Viscount Falkmouth	W. Harris, Architect, Gliffach	May 6
Work at Bishop's Cleeve, Upton Park	Windsor R.D.C.	J. Rogers, Engineer, Town Hall, Earlestown	May 6
Four Houses, Gliffach, Pengam	London and Westmore R.D.C.	Tregothnan Office, Town Hall, Earlestown	May 6
Two Lift Gasolider	Worcestershire C.C.	W. Menzies, Surveyor, Enfield-green Surrey	May 6
Pair of Cottages at St. Michael, Penkivel, Cornwall	Parish Council	J. Ennals, Surveyor's Office, Copford, near Colchester	May 6
Cartage	Loanhead Town Council	A. H. Parker, F.R.I.B.A., 5, Foregate-street, Worcester	May 6
Road Materials and Team Labour	Buddford Corporation	T. A. Pearce, Clerk, Charminster, Dorchester	May 6
Infant Schools, Powick	Ilford U.D.C.	J. Somercol Carraze, C.E., 1, Winkins-place, Edinburgh	May 8
Repair, Painting, etc., Lych Gate, Charnminster	Kirkcaldy Corporation	A. B. Mountain, Boro. Eng. Elec., St. Andrew's-rd., Huddersfield	May 8
Cement Concrete Footpaths	Southampton Corporation	H. Shaw, Engineer and Surveyor, Town Hall, Ilford	May 8
Rick and Ash Plant	Highgate Corporation	J. Rogers, Secretary, Highgate-st., Rhos, Euxon	May 8
Excavations for Plant	Barry U.D.C.	J. J. Behnson, Landra's Vicarage, St. George's, Euxon	May 8
Cottage at Fairfield, Walsall	Co-Operative Society	Burgh Electrical Engineer, Electricity Works, Kirkcaldy	May 8
Painting, etc., Welsh Calvinistic Ch., Rhoe-lan-erchur	Carver Baptist Church	J. A. Crowther, Boro' Engineer, Market-chambers, Southampton	May 8
Repairs, Landraque Church Tower	The Trustees	J. Parkinson, Engineer, Gasworks, Mill-lane, Birmingh.	May 8
Up-to Water-Tank Boilers, Victoria-road	Hendon U.D.C.	F. M. Harris, Engineer, Gasworks, Barry	May 8
Gravels and Gravel	Great Western Railway Co.	F. W. Hill, Architect, King-street-chambers, Bridgewater	May 8
Conver. of Disused Gasolider into Garage	Richmond Main Sewerage Board	J. & F. J. Hurley, Architects, 10, Bridgand-road, Aberkenig	May 8
Supplies, Gas and Water Department	U.D.C.	J. Tyson, Clerk, Harbour Office, Whitehaven	May 8
Buildings, Bridgwater	Visiting Committee	G. M. Mills, Secretary, Paddington Station, London	May 8
Chapel, Bridgwater	West Ashford R.D.C.	Engineer at Neath Station	May 8
Pair of Dock Gates, Queen's Dock, Entrance	North Eastern Railway Co.	Engineer's Office, Paddington W.	May 8
Baptist School Chapel, Cathays	Directors North Eastern Ry. Co.	Engineer's Office, Newport Station	May 8
Road-making Works	Twickenham U.D.C.	W. Fairley, Engineer, West Hall-road, New Kew Garden, S.W.	May 8
Stone, Stockbridge	Faversham R.D.C.	H. Shaw, Engineer and Surveyor, Town Hall, Ilford	May 8
Station Buildings, Aberdare	South Molton R.D.C.	F. Morris, Town Hall, Aberdare	May 8
New Carriage Shed, etc., Acton	Castledore Education Committee	W. J. Taylor, County Engineer, Winchester	May 8
Section of Thirty-six Houses at Cardiff	Castledore U.D.C.	A. Sunz, Surveyor to Council, Charing	May 8
Temp. Shelter in camp with Hospital, Chadwell Heath	Richmond Main Sewerage Board	do.	May 8
Schools, Aberdare	U.D.C.	do.	May 8
Converting Store into Mortuary at Asylum, Knowle	Visiting Committee	do.	May 8
Chapel, Bridgwater	West Ashford R.D.C.	do.	May 8
Pair of Dock Gates, Queen's Dock, Entrance	North Eastern Railway Co.	do.	May 8
Baptist School Chapel, Cathays	Directors North Eastern Ry. Co.	do.	May 8
Road-making Works	Twickenham U.D.C.	do.	May 8
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HADHAM.—For sinking of a borehole 8½ in. diameter, 270 ft. deep, with all requisite steel lining tubes; the supply and fixing of No. 2 deep well pumps and No. 2 oil engines, with all necessary fittings and connections, for the Rural District Council. Messrs. Pollard & Tingle, engineers, 31, Old Queen-street, Westminster, S.W.:—

H. G. Featherby	£1,418 14 2	Cheeld & Co. £1,156 4 2	J. Thorn	1,040 18 8	
H. Brown & Co.	1,330 14 2	Duke & Ockenden	997 7 8	C. Isler & Co.	987 9 2
T. Tilley & Sons	1,261 4 2	Crosley Bros. & Le Grand	786 4 2	Arnold & Son, Leeds and Doncaster	26,360
Britannia Engineering Works	1,236 3 2	Sutcliffe	745 19 2		

£ Exclusive of boring.

MANCHESTER.—First contract for foundations. Royal Infirmary. Messrs. E. T. Hall, London, and J. Brooke, Manchester, architects:—

Morrison & Son	£38,475	C. H. Normanton & Sons	£26,959
Leslie & Co.	37,200	R. Neill & Sons	26,902
P. Hodgkinson	33,800	Arnold & Son, Leeds and Doncaster	26,360
Posker & Dickson	31,970		
H. Levatt	30,418		
Brown & Sons	27,000		

MARKET BOSWORTH.—For 235 yds. of 9-in., 162 yds. of 6-in., and 7 yds. 12-in. earthenware pipe sewers, etc., Bagworth, for the Rural District Council. Mr. W. Morton Sykes, Surveyor, Chapel-street, Ilkstock:—

Orton	£219 0 0	Beck & Son	£174 15 9
A. Palmer	207 0 0	T. H. & S. E. Hugglescote	173 0 0
Hewes Bros.	204 10 0		
B. Shipman	193 10 0		

METHWOLD (Norfolk).—For alterations and additions to the Methwold Non-Provided School. Mr. Arthur J. Lacey, Architect and Diocesan Surveyor, 6, Upper King-street, Norwich:—

J. H. Mann	£664 0 0	Atherton & Co. £903 0 0	
H. G. Totts	652 4 7	T. Curry Boldry, Methwold	547 12 6
R. Dye	649 15 0	H. A. Colliam	539 2 10
A. E. Chapman	648 0 0	J. W. Collins	535 0 0
Boughton & Sons	632 9 0		

NEWARK.—For repairing old service reservoir, Beacon Hill, for the Corporation. Mr. G. Sheppard, Borough Surveyor, Newark:—

W. Smith	£103 7 0	C. Balnes, Lombard-street, Newark	£95 0 0
Brown & Son	99 10 0		

[Surveyor's estimate, £111.]

PONTEFRAC.—For erecting Wesleyan Church and schools, for Sandal, near Wakefield. Messrs. Garside & Pennington, architects, Pontefract. Quantities by architects:—

Brickwork: Higgins & Pashley, Wakefield	£1,106 3 7
Woodwork: J. W. Harrop, Ossington	694 15 6
Plumber: H. G. G. G. Wakefield	206 15 0
Slaters: Scholey Bros., Beeston	
Hill, Leeds	115 10 0
Plasterers: Lockwood Bros., Wakefield	50 14 0
Painters: W. Carver, Wakefield	31 15 0

[Eighty-five Tenders received.]

RAMSBOTTOM (Lancs.).—For 1,300 yds. of earthenware pipe sewers, etc., for the Urban District Council. Messrs. J. Diggle & Son, engineers, Heywood and Westminster:—

J. Arundel Exors., Bradford
 £806 8 9 |

RAMSBOTTOM (Lancs.).—For constructing Anne-street, for the Urban District Council. Mr. T. H. Bell, Surveyor, Council Offices, Ramsbottom:—

C. Lomax, Orchard Mill, Ramsbottom
 £121 6 10 |

ST. ALBANS.—For erecting swimming baths in Cotton Mill-lane, for the Corporation. Mr. G. Ford, City Surveyor. Quantities by Messrs. Franklin & Andrews, Ludgate-hill, E.C.:—

J. Dickson	£1,611	J. T. Bushell	£1,275
E. Dunham	1,400		

[All of St. Albans.]

ST. MERRYN (Cornwall).—For building a new Wesleyan Chapel, for the St. Merryn Wesleyan Chapel Trustees. Messrs. J. Ennor & Son, architects, Central-square, Newquay:—

E. Warne	£598 10	W. S. Tippet, Newquay	£545 0
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SLEIGHTS (Yorks).—For the erection of a seven-roomed bungalow, for Mr. E. Anderson. Messrs. Barrett & Driver, architects, 23, York-place, Baker-street, W.:—

J. Bram & Sons	£326 10 0	R. Harland	£206 0 0
W. Chapman	316 0 0	J. Hutchison	241 8 6
T. R. Fletcher	302 0 0	Sleights	220

Accepted reduced Tender, £220.

STANLEY.—For making of Back Towneley-street, for the Urban District Council. Mr. J. Routledge, Surveyor, Council Offices, Stanley:—

J. Thompson	£268 16 0	Johnson & R. C. Birtley	£119 5 6
J. McLaren & Son	123 16 0	Strong, Stanley	

TODDINGTON (Glos.).—For the erection of a pair of six-roomed cottages and a seven-roomed single cottage and bath-room, for Mr. H. Andrews. Messrs. Barrett & Driver, architects, 23, York-place, Baker-street, W.:—

Pair of Cottages.

G. Howman & Co.	£463	Collins & Godfrey	£356
T. Hopkins	423	Estcourt & Sons	806
J. A. Oakley	420		

Single Cottage.

J. A. Oakley	£426	Collins & Godfrey	£324
T. Hopkins	395	Esplay & Co., Ltd.	295
G. Howman & Co.	346	A. Estcourt & Sons	274

TRIMDON.—For alterations and additions to parochial schools. Messrs. J. Potts & Son, architects and surveyors, 67, John-street, Sunderland:—

J. M. Boyd	£137 10	J. Armitage, Sunderland	£116 0
W. V. Steelling	120 0		

WHITBY.—For erecting a pair of semi-detached villa residences, Bagdale, for Mr. Harrison Baxter. Mr. E. H. Snare, architect, 5, Flowergate, Whitby:—

Excavating, Brickwork, and Masonry: J. Gladstone, Whitby
 £1,100 0 0 |

Carpenter and Joiner: J. White, Whitby
 518 16 0 |

Slater: Dodgson, York
 88 15 0 |

Plastering: Southon & Taylor, Whitby
 125 0 0 |

Plumbing, Glazing, etc.: J. Brown & Son, Whitby
 198 10 0 |

Painting: W. Henderson, Whitby
 26 5 0 |

Full Tenders Received.

J. Kidd
 £2,572 14 0 |

Coverdale & Sons
 £2,262 10 0 |

Longhorn
 2,538 10 4 |

W. Chapman
 2,398 15 6 |

A. Palfoman
 2,278 15 6 |

[All of Whitby.]

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diameter, 27
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H. Brown
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Engineers
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J. Brooks,
Morrison &
Leslie & Co
P. Hodgkin
Foster & E
H. Lovatt
Brown & f

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Orton ...
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Heves Br
B. Shipman

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J. H. Ma
R. O. Tol
R. Dye
A. E. Cha
Boughton
Sons .

NEW
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Borough
W. Smith
Brown &

PONT
schools,
& Penn
architect
Br
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RAM
ware p
Messrs.
ministers
J.

RAIL
street,
Beil, &
C. I

ST.
Cotton
City
Andr
J. Di
E. D.

ST. MERRY (Cornwall).—For building a new
Wesleyan Chapel, for the St. Merry Wesleyan Chapel
Trustees. Messrs. J. Ennor & Son, architects, Central-
square, Newquay.—
R. Warne 2598 10 | W. S. Tippet,
Newquay* 2545 0

CHURCH BENCHES & PULPITS.

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PROPOSED HOUSE AT REIGATE.—MR. ERNEST NEWTON, ARCHITECT

The Builder.

VOL. LXXXVIII.—No. 3248.

MAY 6, 1905.

ILLUSTRATIONS.

Council Chamber, Cardiff Town Hall.....	Messrs. Lanchester & Rickards, Architects.
Barclay's Bank, Chelmsford.....	Mr. Arthur Blomfield, F.R.I.B.A., Architect.
S. Erkenwald's Church, Southend.....	Mr. W. J. Tapper, A.R.I.B.A., Architect.
1. Exterior View.	
2. Interior View.	
The Out-Voluntary.....	From a Charcoal Drawing by the Editor.

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The Royal Academy Exhibition.



HE Exhibition this year may be considered a good and interesting one, though it contains no great and dominant work which would be worth a visit for itself.

indeed, if one were asked to name the best picture of the year, it would be difficult to make the selection; and Mr. Abbey, among other Academicians, does not exhibit this year is a disappointment at least one great possibility.

The largest work of the year is Mr. Rossetti's picture of the "Communal Dining of the Burghers of Landsberg" (358); which, like another picture of the same type which he exhibited some years ago, is hung in Gallery I (occupying all one side of it) so as to be seen from the entrance, and would give the same optical illusion as before, of the entrance of a new room, but that the picture is intercepted by the large statue of the centre of the octagon hall. The picture represents with great force and reality the interior of the council chamber, with the opposite houses seen through the windows, and the Councillors seated in a row with their backs to the light, and another row right and left at each end. Various portraits have much character and individuality; but after all, this is a kind of official picture, more interesting to those for whom it was painted than to the general spectator.

The fact of putting most of the figures with their backs to the light (apparently for the sake of getting the vista through the windows) has left the painter in the difficulty, in order to render his portraits distinctly, of being obliged to throw more light on the faces than there could really be in that position of lighting. There may be supposed to be windows opposite, of course; but nevertheless, a face seen against a window, with the light behind the head, must show darker than these do. The interior of the room is not of particular interest architecturally, and on the whole one can hardly say that the picture is worth its space at the Academy, though it will be a valuable possession for Landsberg.

The same cannot be said of the other large portrait picture, Mr. Sargent's "The Marlborough Family" (256). This is essentially a family picture to hang in a historic house, and it has the grand style suitable for such a painting, and is in itself a picture of great power of composition and colour, and one of the finest things certainly in the exhibition, though we do think the neck of the lady is rather Rossetti-ish in its length. The painter has taken advantage of the peerage robe to give breadth to the figure of the Duke. Whatever one may say of the "ideal" in art, the "real" painted in this way appeals more forcibly to our minds than the loftiest ideal treated with less mastery, as one must admit on looking at Mr. Dicksee's "The Ideal" (15) in the first room—"The passion that left the ground to lose itself in the sky." One may paint a nude red man (why is he so

very red?) springing after a visionary phantom figure in the clouds, but our ideals are not much appealed to after all. It would make, however, a good decorative wall painting in a position not too near the eye: as an exhibition picture it fails because so much is claimed for it in the idea, to which it does not rise. Michaelangelo alone, perhaps, could really paint such a subject in a way to compel our assent. However, it is an ambitious and well-meant attempt, and one should honour an artist who strives after the ideal, even if he does not quite succeed.

Sir L. Alma-Tadema knows his own powers exactly, and never attempts the ideal. His "Finding of Moses" (212) is a picture mainly of splendidly painted Egyptian archaeological detail and admirably painted figures; but it is not only not ideal, it is hardly even human; there is not a touch of feeling in it. One might have thought that the daughter of Pharaoh would have shown something of motherly tenderness to the waif in the osier basket—"she had compassion on him," says the biblical narrative; but there is no such feeling evident on the part of this great lady carried aloft on her splendidly decorated litter, shaded by fans held by attendants, and turning her head with an amused smirk as she passes the basket and its burden. Her expression suggests nothing more than that it was an amusing incident on her way up from bathing. The picture is arranged in a processional form, a horizontal composition passing across the canvas from right to left; perhaps the two planes on which the figures move do not

sufficiently detach themselves; but it is full of interesting detail. In the distance is the opposite bank of the Nile, with a crowd of small figures, also not without their interest. We have got so used to this artist's mastery of Greek and Roman subjects that one hardly knows whether to wish that he should leave these for Egypt; this picture is not equal to his greatest successes in the other class of subjects; but Egyptian architecture and art has great possibilities for a painter of Sir L. Alma-Tadema's special powers, and he may do much more with it yet. What we do want to see from him, however, is a picture of the interior of the Colosseum during a great show, with a group of the spectators in one of the galleries as foreground figures. He might make a wonderful picture of that, and he is perhaps the one person who could do it.

Mr. Gow, on his part, has not done wisely in quitting his Jacobite and Peninsular scenes of warfare to attempt to portray "A Roman Triumph" (182). He is not in his element there; the picture is hard, theatrical, and unreal, and the architecture poorly painted and not in perspective. Among the important pictures in which figures are the principal element is the late Mr. Furse's "Cubbing with the York and Ainsty; Children of the Master Lycett Green, Esq." (515). This hangs where his remarkable picture, "The Return from the Ride," hung two years ago; and though nominally a portrait group, it is one of those which we look at rather as a picture than as portraiture. It is a mounted group of young people who pass across the picture, one of them on a white horse with a very vigorous action. It is not nearly equal to the "Return from the Ride," but the Academy were perhaps right in purchasing it out of the Chantrey Fund, seeing that there is, unhappily, no more to be had from its late gifted author. But why did they not purchase "Diana of the Uplands," if it was to be had? In a pictorial sense it is certainly the most remarkable work that Mr. Furse ever painted. Another large picture which probably is, but does not profess to be, a group of portraits, is Mr. Collier's "The Cheat" (387), a quartet of two ladies and two gentlemen playing presumably at Bridge; the situation is sufficiently implied by the title. It is not a nice subject to have painted, and it has the defect that it does not absolutely explain itself; it is open to doubt whether the lady standing up is the accuser or the accused, since the expression on her face (forcible enough) is not so much that of indignation as of insolence, and is open to the interpretation that she is prepared to brazen it out; if the face had expressed a more dignified indignation there would have been no doubt on the matter. We presume, however, that the seated lady is the culprit. It is a clever picture, but an unpleasant subject, treated in an unpleasant manner, and looks like a kind of libel on the Society of the day.

Among paintings of romance, classic or mediæval, is Mr. Waterhouse's "Lamia" (125), in which his now well-known lady with the bright red hair kneels cajoling before a knight in armour. We do not,

we confess, know any Lamia but Keats's, and this is certainly not she; we do not recollect whether Keats drew upon an existing legend, but if he did, it was certainly Greek, not mediæval; indeed, the personages of his poem are antique, so far as they can be referred to any period. However, this is a picture of a knight and a lady, fine in colour and composition, and "Lamia" does well enough as a title; only if the artist had tried to realise for us on canvas, and had succeeded in realising, the sinister creation of Keats, he would have produced a picture of much higher intellectual interest. As it is, our impression is that the picture was painted as a composition, and the title "Lamia" tacked on to it afterwards; but painters (too often) have that way with them. Was it the same also with Mr. Draper's "Ariadne" (260)? Did he set out to paint Ariadne, or to paint a nook in a rocky coast, and a bit of sea lovely with glancing colours and reflections? For that is what makes the picture; not the figure, which has little interest or pathos. Ariadne has suffered a good deal at the hands of modern English painters, who seem to think they have done all that the subject requires when they paint a woman in some apparent distress—a kind of *genre* Ariadne; whereas Ariadne should be a great idealised figure, the summary in her person of the whole tragedy of woman abandoned. Watts alone, as far as we can remember, has risen to this conception. Mr. Storey's "Venus lamenting the loss of Adonis" (445) curiously conventional as it is, has a fine quality of colour and pictorial conception.

Among the more important of the pictures dealing with the life of the present day there are two worth especial notice. Mr. Stanhope Forbes's "Home-along" (535) is one of his most successful and interesting works of this class. The scene is on the quay of the harbour of a small fishing town, with a clear evening light behind the high land at the back of the scene, and figures standing about and exchanging salutations with the men going home from work. The charm of the picture lies in its completeness, in the atmosphere of evening quiet and rest from labour which pervades it, and which has a poetry of its own. The other picture we referred to, Mr. Chevallier Tayler's "Sisters" (711) is of a different and more dramatic interest, and is a more serious piece of work, in feeling and intention, than we generally see from this very clever painter. The story here is told as incisively as possible; the sister who has sold herself for wealth has come in her carriage to the fish-market, where she finds her mother and her honest sister keeping a stall, and retreats to her carriage before the indignant and contemptuous eloquence of the sister, while the mother weeps. It is well painted in every part; the figure of the virtuous sister is fine and energetic, and the work as a whole is quite a success. A pleasanter and happier subject of humble life is Mr. Wetherbee's "Hark, Hark! the lark" (349), which is as much a landscape as a figure picture; there is a very successful effect of sun-rise, and a man ploughing in front of the morning light, while a girl nearer the

foreground and looking up at the lark gives the title to the subject. The grey tone of the dew-covered grass is a point to be noted in a carefully studied and charming little picture. Mr. Bacon's "His own poems" (64), in the first room, should not be passed over, because it is not, but he is a very unequal artist, and the bit of humour, clever as it is, is far below his remarkable work of last year. The rest of his exhibits are portraits.

Besides the great portrait group of the Marlborough family, Mr. Sargent exhibits a very fine one of "The Countess of Warwick" (168), her face seen light against sky (in this case again a convention which could not exist), and her little boy on a kind of pedestal by her. Thus, like the Marlborough picture, is of the order of sumptuous portraits, and a most effective work of its kind. The same artist's power in dealing with a plainly realistic portrait with no search after effect—a likeness merely—is shown in his life-like and interesting portrait of our honoured London centenarian, Señor Manuel Garcia (51). Mr. Oulless's portrait of Mr. Peter Reid (47) which hangs as a pendant to the last-named, may stand as another example of the class of portrait which professes mainly and in the first instance to be a good likeness, though, in the case of the Garcia portrait, interesting as also by its style and treatment. So with Mr. Orchardson's half-length portrait of Mr. Colls (the one presented to him recently at the Builders' dinner), which hangs in the large room (221); a good likeness, but interesting beyond that for its individuality of style and colour. At the head of Gallery III. hangs Mr. Fildes's large canvas containing the portrait of the Queen (146), which in the catalogue is described as "The State Portrait; painted by Command of H.M. the King." What, we wonder, is supposed to be the quality, in an artistic sense, which goes to make a "state picture"? This one fulfils the requirements of being especially sumptuous in effect; "stately" in fact would be the adjective to describe it, and this we suppose is as it should be; but it is rather hard in style, and not one of the most interesting of the portraits from an artistic point of view; for a state portrait must evidently give up something, and not assert itself too strongly. Among portrait groups Mr. Solomon has a clever and interesting one of his own family (apparently), under the title "Papa Painting" (80). Mr. Ralph Peacock has a charming portrait of a little child (722) standing in the open air with large blue hat on, and leaning against a broad tree trunk. But the portraits of the year none please us more than Mr. Cope's, in Gallery IV., of "Mrs. Edward Joicey" (274). This is a portrait which in its full broad style and colour has much of the quality of Millais at his best, and might almost be taken for a Millais.

The finest landscapes this year (if it is not an Irishism to put it so) are sea paintings. Mr. Hemy exhibits two pictures of great power, both dealing with ships of war; "Betrayed by the moon" (299) and "Escape of the Destroyer" (428). The first is a scene in which a torpedo destroyer has been caught sight of by moonlight from a main

which has turned her search-light on, so that here we have a rough sea with the surface lighted by an electric light which fairly puts out the moon. It is a difficult subject treated with great power; but this is perhaps surpassed by the companion work, which shows the sequel of the incident, how the destroyer escaped. Here the destroyer is on the right of the picture, rushing through the water, which surges up to the top of the hullmarks, and with a forced draught in which sends a mass of flame and smoke from the funnel; in the distance is a battleship, and a fountain of water rising shows where one of her shots has struck the surface. The sea-water is painted with that power of representing the surface and the swing of sea-water in rough weather of which Mr. Hony Jones at present possesses the secret. These are two great pictures of their kind. Mr. Wylie exhibits a large Trafalgar picture—"Trafalgar, 2.30 p.m. October 21st, 1805" (459); the ships are portraits as far as possible, their names are given below on the frame. This is a fine picture of the great historic sea-fight, carried on upon blue water and under a blue sky, and apparently, from the sit of the sails, in a very light wind. The ill-fated "Santissima Trinidad" forms the main foreground object with a floating wreck of masts and cordage beside her. There seems a rather unnecessary or unaccountable wave and trough of the sea just in the foreground, as if put in to give foreground incident (something in the way in which Turner used to manage a wave just where he wanted it); this kind of unexpected wave seems rather often to get into the foreground in pictures of naval engagements; and we should feel a little sceptical also as to the shot-masts in the royals of the ships; naval gunnery had not a very long range in those days; actions were fought at close quarters, and one could hardly suppose they fired in the air at a ship's top-sail masts. But as a whole this is a fine and carefully studied picture of a great subject. Among landscapes perhaps the best in the exhibition is Mr. East's "Autumn in the Valley of the Rhine" (741), in that it best fulfils the real object of landscape-painting in giving the sentiment and feeling of a scene rather than an attempted realism. His "Early Morning in the Cotswolds" (734) is a picture of the same kind of excellence, though not quite equal to the other one. This is not a strong year for landscape—few Academy years are, landscape is not the strong point of the English school at present; there is much of prettiness, too little of power. Mr. Aumonier's one landscape, "The Black Mountains" (198), is a fine one in a somewhat dreary undulating country; a poetic picture; and Mr. Amesby Brown's "Sundown" (18), a level composition of landscape and cattle, as a pervading repose of effect—partly due to the lighting, partly to the lines of composition—which gives it a distinctive character. Mr. David Murray's landscapes illustrate the want of this principle of a pervading intention in the composition; as usual with him now, they are not composed at all, but are completely ragged in line and uncertain

in aim, all except his Diploma work, "Swedes" (257), now exhibited, but we should imagine painted some time back. This, showing a flat turnip-field with a large sky above it, is really a landscape painting in the true sense of the word; he could paint landscape then; he seems to have given it up now, and only paints scenes. If one regarded landscape-painting as the endeavour to give the realism of a scene, no doubt Mr. H. W. B. Davis's "The Farm Gate" (50) would bear away the palm this year. It is a scene outside a farm-yard gate, with trees shadowing the foreground; the foreground incident, the bits of worn path and the grass between, and the look of the whole thing, are so real that one might almost walk into it, nor does he forget the little bit of distance which lends enchantment to the view; it is a most charming picture, yet somehow one feels that the highest ends of landscape painting are not aimed at in it. We prefer, though it is less striking at first sight, his smaller picture "The Fields in Early May" (84), more especially for the way in which the middle distance country is modelled and mapped; the larger picture is practically all foreground; this one is not, and presents some of the broader elements of landscape. Among smaller works, one that cannot be passed over without special mention is Mr. La Thangue's brilliant and forcible little picture, "Selling Oranges in Liguria" (226); it is rarely that one sees such a bright effect of colour, light, and air in a painting.

There are a good many pictures of miscellaneous interest of which we may take some note on another occasion; we have aimed in this article only at characterising the salient features of the exhibition. But it is remarkable, when one comes to go into it, what a number of pictures there are (amid many mediocrities) which are really worth attention. We cannot but make this remark in view of the constant habit at present among art-critics (or those who claim to be such) of abusing the Royal Academy and talking with contempt of its exhibitions; it seems to be a kind of Shibboleth to prove that you are in the right set, just as "praising the works of Pietro Perugino" was said to be in Goldsmith's day. Now the fact is that if you were to pick out the hundred or two best works from any average Academy exhibition, you would have the best mixed exhibition of the year, and only prejudice or wilful blindness could question it. If the experiment were to be tried this year, for instance, the New Gallery Exhibition would be simply nowhere in comparison. The Royal Academy is not all that it should be or might be, but the wholesale abuse of it by writers in magazines is a mere fashion of the day—and a very foolish fashion.

MEMORIAL OBELISK, STAPLEHURST. — The memorial, erected at Staplehurst to the memory of the Staplehurst and Frittenden Protestant Martyrs, was unveiled by General Sir William Stirling, K.C.B., R.A., on the 26th ult. The monument, which is an Aberdeen granite obelisk, 16 ft. high, has been erected at the corner of the Marden-road. It weighs altogether about five tons, stands on a concrete foundation, and is enclosed by an iron railing. The memorial was designed by Mr. W. Brooks, who also superintended the carrying out of the work.

NOTES.

We publish in another Registration column a letter from Mr. G. A. T. Middleton, who (as our readers are probably aware) has been a very active propagandist of Registration for architects, putting the case from his point of view, which is rather a new one. He says that he regards it as an influence in favour of the more complete education of architects, who under the proposed system would have no chance of being allowed to practise unless they could prove their proficiency in the science of building. We have no doubt Mr. Middleton is sincere in putting it in this way, but we fear we cannot accept that as representing the general basis of the movement. The real motive, to stop builders and others from calling themselves architects and thus (as is supposed) injuring the pockets of the profession, has been too much flourished, in the provinces especially, to leave any doubt possible. In regard to that point we may once more ask, is architecture an art or a business? If it is an art, why are architects to be more sensitive than sculptors, who must constantly pass the shops of carvers and monument-masons with the word "sculptor" written up, and yet possess their souls in patience? And if architecture is to be regarded as construction, how is it that the engineers, whose work is construction and nothing else, do not find registration necessary? The real answer to this, as well as to the education argument, is that the engineers are a united body and the architects are not. For an engineer not to be a member of the Institution is a stigma against him; for an architect not to be a member of the Institute is not, because architects will not all combine. If membership of the Institute were a practical necessity to an architect as membership of the Institution is to an engineer, the Institute's examination would answer all purposes. If a Registration Bill is passed (which we think very doubtful), it will be indirectly the fault of the very men who object to it most—those who will not support the Institute and who therefore weaken its hands. And as to the question of the jerry-architects, the effect of such a Bill will necessarily be to confirm their position. We can imagine nothing more calculated to lower a great art to the level of a trade.

The Walls of Berwick-on-Tweed.

It is announced that H.M. Office of Works have decided to take over, with a view to their maintenance in future as a national monument, the ruins of the older walls of Berwick, whereof the spoliation had recently been sanctioned by the Town Council. The pieces of the wall, at present hidden for the most part by grass-covered mounds outside the later fortifications of temp. Elizabeth, were built by King Edward I., and in or after 1318 were raised and strengthened with towers by King Robert Bruce, who there, together with his son-in-law Walter, the High Steward, withstood the attacks of Kings Edward II. and Edward III. The wall formerly extended eastwards from the castle to the fort in the Magdalene-fields, and

thence southwards to the sea, where is now the malt-house in Pier-road. The ruins include the Bell Tower, which contained the bell for sounding alarm on the occasion of an incursion from across the Tweed. The tower, however, presents indications of being a restoration effected at a later time, and seems to belong to the Tudor period. In Queen Elizabeth's reign the fortifications of the town were strengthened, and a new rampart, built of earth and stone, was erected within the Plantagenet wall. It has since been converted into a promenade with a saluting and other batteries, and is in the care of the War Office.

A Lesson from Antwerp.

NOTWITHSTANDING the efforts of Government, and a Royal Commission, and the Bills promoted by public bodies and private associations for the improvement of the port of London, we seem to be as far as ever from the consummation of that desirable object. No one can expect that the various authorities having jurisdiction over the Thames will ever agree upon co-operative action, or that a satisfactory solution of the problem will be found until Parliament makes up its mind to settle the matter without further nonsense. The agreement recently concluded between the Belgian Government and the municipal authorities of Antwerp comes as a striking illustration of what can be done when people are willing to drop petty jealousies and work together for the common weal. In virtue of this agreement a new channel, five miles long, will be cut through the bend of the Scheldt at the north of the city and a succession of docks and quays will be constructed along the new waterway, thereby giving four times the existing accommodation for shipping. The project involves the demolition of the old fortifications and the building of an outer circle of forts by the military authorities. It is estimated that the total cost will exceed 12,000,000*l.*, and the completion of the works will make Antwerp one of the largest and best-equipped ports in the world. We talk; other nations act.

The Wall in Grosvenor-place.

In a letter to the *Times* of Tuesday, Mr. Cowper-Coles makes a suggestion which the Commissioner of Works and the Westminster City Council will do well to take into consideration. It is known to most Londoners that the high brick wall forming the western boundary of Buckingham Palace grounds presents a deep concavity not far from its southern end, with the result that the pavement attains a maximum width of something like 40 ft. The increased space on the footpath is not of the least use to passengers, and its only effect is to encourage the accumulation of dust in dry and windy weather. At the corner of Lower Grosvenor-place the pavement narrows so that foot-passengers have scarcely room to walk. In the letter to which we refer it is suggested that the wall should be taken down and rebuilt so as to throw the unnecessary pavement area into the palace grounds, and to increase the width of the footpath and carriageway at the corner of Lower Grosvenor-place by taking away a small slice of land, which forms no part of the

pleasure grounds, although included within the boundaries of the palace property. The improvement would be a great boon to the public, and we hope the proposal will commend itself to the authorities concerned.

Electric Power Supply.

THE supply of motive power at a very cheap rate will probably revolutionise many of our industries. In particular, it will be a great boon to the small manufacturer. The paper, therefore, by Mr. A. M. Taylor on "Motor Load Development," which was discussed this week at the Institution of Electrical Engineers, is of more than technical interest. The author starts by assuming that the existing prices for power quoted by small stations are quite prohibitive when the load is required for several hours a day. He suggests that central station engineers should sell power at extremely low rates to all consumers who are willing that their motor supply should be cut off for one or two hours a day during the "peak" of the lighting load. Practically the only objection to this suggestion is that in the event of a day fog coming on suddenly the motor load would swamp the lighting supply. Mr. Taylor discussed this difficulty at length, and proved that, in the case of a provincial town, at least, the difficulty was not a real one. Even in London the "restricted hours" system was applicable if certain precautions were taken. In Montreal, where a rebate of about 20 per cent. on the meter bill is offered to those consumers who agree not to use the supply during the peak of the lighting load, it was found that 30 per cent. of the consumers accepted the restrictions. It has recently been estimated that, if power were supplied cheaply, a load of 500,000 horse-power could easily be obtained in London. Mr. Taylor points out that, if 30 per cent. of this demand could be obtained on the "restricted hours" system, it would be very profitable to the supply companies, as they could easily supply this load without any additional expenditure on machinery or cables. It will sound very attractive to many consumers to hear that the price suggested was from $\frac{1}{2}$ d. to $\frac{3}{4}$ d. per unit. In the discussion it was stated that at Bradford about 700 motors were let out on hire. Mr. Taylor also suggested that when an unrestricted power supply was desired the difficulty of the peak load might be overcome by means of a few accumulators and a small dynamo on the consumer's premises. This could easily be arranged, and is perfectly feasible.

The Expansion of Clay.

In a paper read before the Society of Engineers, Mr. Ernest R. Matthews gave a striking illustration of the expansion which takes place in clay when a large vertical surface has been exposed. This was the case at the back of the parade extension at Bridlington, where the clay had been exposed in connexion with the building of a retaining wall. The foundation trench for the wall was excavated on a Saturday morning and the width was carefully measured. On Monday morning the filling in of concrete was to have been commenced, but, before proceeding

with this, the author had the width of the trench measured again, with the result that it was found to be 5 in. less than the previous measurement. This diminution was owing to movement of the clay, and upon examination of the ground some feet back several cracks one of them nearly 2 in. wide, were covered in the clay. The author further mentioned the case of a retaining wall that had been pushed entirely out of line by the movement of clay, caused in the first instance by expansion resulting from the exposure of a vertical face to the air.

The Garden City.

THE garden city, as it is called, in Hertfordshire seems to be making satisfactory progress. Its course will, as we have previously pointed out, be watched with interest and sympathy, not because this semi-philanthropic enterprise can be repeated, but because it may act as an example to the authorities of existing and growing towns to recognise the importance of space and foliage in a town. Nothing can be more inexcusable than the way in which London has been allowed to grow without care being taken to reserve spaces of greenery. The so-called "gardens" are absolutely, in most cases, misnamed. But a garden city has long existed in Great Malvern where each house usually stands in a garden, and where in the springtime dwellings can scarcely be seen among the white flowers of the fruit-trees. Great Malvern is an example to be followed in every town in Great Britain, and it reaps its reward not only in the pleasure which it gives to its inhabitants, but by the healthiness of the town itself, arising from abundance of space.

LETTER FROM PARIS

THE Société Nationale des Beaux-Arts (Salon) have elected M. Alfred Roll president, in place of M. Carolus-Duran, who has to resign to take up his duties as Director of the School at Rome. M. Roll was one of the most enthusiastic founders of the New Salon, along with Meissonier and Puvis de Chavannes, and the choice is generally approved in the artistic world. M. Roll, who is a Parisian, was a pupil of Gérôme and of M. M. Besnard has been appointed Vice-President of the Section of Painting, in place of M. Lhermitte, who takes the place of Besnard.

M. Redon, the architect to the Louvre, is present engaged in completing the construction of the Pavillon Marsan, the new wing which has not for some years been under construction, in consequence of the unfinished grand staircase occupying all the central part of the building. In the place of the old staircase, which was so inconvenient as it was stately, there is a large nave with side galleries at half its width, these, as well as the main floor, are occupied by the Union des Arts Decoratifs. Here is installed the collection of wood carvings and furniture left by M. Peyron, who had intended this collection as a gift to the Louvre. It is said that the galleries will be opened in the summer, though it is probable that the Salon has a bad name for its present state.

The Service des Beaux-Arts of the Municipality, which generally keeps its exhibitions with the public, is opening this week, as announced, its exhibition of works in metal at the Musée de la Ville de Paris. It will contain remarkable objects in the shape of metal work allied to architecture; handrails, iron doors, staircase ramps, etc. The equestrian statue of Lafayette, offered by the Americans, and executed by the American sculptor, Mr. Bartlett (pupil of B. Carpeaux), is to be shortly erected in the Louvre.

designed by an American architect, the Square du Louvre, where the plaster shell has been provisionally placed. It is an interesting work, but is rather lost behind the massive monument to Gambetta.

It is decided that there is to be a Metropolitan railway under the Grands Boulevards, which forms an inner circle, has been decided by the Committee of the Municipal Council. It will start from the Place de la Concorde, running under the Rue Royale and along the line of the Boulevards from the Bastille to the Place de la Bastille. It will pass under the Seine and return to the Place de la Concorde, or to the Invalides, by the Boulevard St. Germain.

M. Girault hopes to have the new stables at Champs completed in time for the Grand Exposition of Paris. These buildings are very picturesque in appearance. The group consists of four blocks of buildings surrounding a large courtyard. The principal building, forming a quadrangle shows an ascending in red brick on a surface; there is some good wrought-iron to be seen, and the total effect is very successful.

It was proposed recently to erect a statue to Haussmann, who did so much to make what it now is; and the recognition was more fitting, inasmuch as Alphand, who was collaborator, has already a monument. But Haussmann was unfortunately a functionary of the Second Empire, and this connexion is sufficient to deprive him of a monument, in the eyes of the City Fathers. It is even suggested to remove his name from the "Boulevard Haussmann." All this is rather pitiable, and however is only a temporary attitude of the public mind. There can be no doubt that a monument to Haussmann will eventually be erected in Paris, whatever the present administration may think of the matter.

LAMBETH MUNICIPAL BUILDINGS COMPETITION.

The important nature of the proposed municipal offices for the borough of Lambeth, combined with satisfactory conditions, has naturally created a large number of architects to take part in the competition for designs. The enormous number of interesting drawings, representing the efforts of 143 competitors, is to be seen every current week at the public baths at Kennington-road.

A spacious triangular site having two road frontages—Brixton-hill and Acre-lane—has been secured to receive the new offices, and a portion of the land is to be reserved for future use, probably a town hall. The accommodation is to be small to these buildings, consisting of a council chamber, mayor's suite, committee room, offices for town clerk, engineer, accountants, medical officers, and apartments for the poor, etc.

Generally speaking, the merit of the work submitted is of a high average, and naturally a great diversity of ideas in the working out of the problem. The angle formed by the intersection of the two streets is about 42°, and the consideration of this element has formed a basis of the majority of the schemes. Some, however, disregard the angle, give up much of the site to public ways, and adhere to square plans more suited to any site but the one at hand. Plans, elevations, and sections to scale, a 1/4 in. detail and perspective were required to illustrate the proposals. The assessing of a competition of this magnitude is a task of some difficulty, and at the time of our inspection of the designs no public announcement of the award had been made. The official leaflets, however, had been placed in the room, giving the information that the award, Mr. H. T. Hare, F.R.I.B.A., is of the opinion that "the design numbered 66 best meets the requirements, and that the author is the appointed architect; that numbers 67 and 68 should receive the second and third prizes respectively"; and that seven other designs are "very excellent." With the exception of the design placed first we are not in agreement with this selection.

The merit of design No. 66 appears to lie in its simplicity and economy of plan, and is probably one of the least costly of the many plans. The principal entrance, at the apex of the triangle, provides access to the offices fronting the respective roads, and the secondary entrances are contrived to serve the central block containing rates office,

appeals office, council chamber and gallery. The two frontages are of different lengths, and no attempt is made to assimilate them in design. The main staircase ascends in and around the piers of a large tower, which, although unusual, does not promise well for what is usually expected in a municipal building. The council chamber and more important departments are admirably grouped at the north end of the building, and, although lavatory accommodation is too small, in general respects the plan may be said to be straightforward and workable. The main entrance, however, is cramped, and the three external doorways hardly receive adequate importance in their design. The tower is beautifully drawn and designed, but loses in interest by rising from an unknown position instead of exposing its whole height from the ground, and its axial setting is not so pleasing as if it had been placed square with and in relation to the principal front. The Brixton-hill front has much dignity and breadth in the management of its masses. It is refreshing to find no pediments, and but a very reserved use of columns, while the ground and first-floor windows are joined up as single vertical stone features in a red brick setting, all with sound detail. In substance, this design will express the importance of the borough and efficiently house its administrators at no very great tax upon the ratepayers—a cry of which so much is heard nowadays.

No. 75, recommended for second premium, approaches the subject in a different way by ignoring the chance of an angle entrance and consequent important treatment of the minor frontage. The principal entrance is placed in the middle of the Brixton-hill facade, and upon this lateral axis the scheme is arranged. A large entrance-hall and staircase lead up to the council chamber, below which is the rates office, served by its own entrance from Acre-lane. Offices are placed left and right of the hall and in a wing on the north front, while a similar block is provided at the south end at a corresponding angle; the wings join up the rates office block, and two areas are thus formed in a symmetrical scheme. The general idea is workable, and the grouping of the principal rooms on the first floor about the staircase very dignified; but there is a large basement, and the plan has the appearance of a strained effort. The dome, rising behind a pediment in the main front, is a mere feature, performing no work of lighting or any other useful purpose. There are two many columns on the same elevation, while the detail is open to improvement. We did not discover the claims of this design for the prominent position it receives in the awards.

The superior qualities of design No. 94, where the recessing of the apex entrance and consequent loss of land to produce an angle facade is resorted to, did not reveal themselves. The arrangement drives the buildings into a small compass, and the author has cleverly extricated himself from the difficulty thus created. But the single entrance to the whole building, from which all sorts of confusion would arise, combined with the commonplace character of the work, are two elements only which should have excluded this scheme from the premiated awards.

Of the seven specially mentioned proposals, No. 4 is perhaps the best both in the matter of plans and elevations; indeed, the perspective view and detail suggest some of the best architecture in the exhibition. Three blocks of offices and corridors are arranged in the form of a triangle, in the middle of which is the council chamber and rates office building set on the axis springing from the centre of the Brixton-hill elevation. Here the main staircase extends to the front wall of the building, where a large window is inserted. Although the public space in the rates office is too small, the scheme is full of admirable points. The rounded angles of the main facade are charmingly treated, but we could wish for a link between the ground and first floor windows and a little less modesty and reserve in the central turret. This excellently symmetrical plan has much to recommend it.

No. 28 is on somewhat similar lines, with some clever points and some wasteful ones. Two main staircases close together are surely extravagant, and the oval-shaped council chamber is a curious idea. Apart from some central and terminal interest the exterior is commonplace. An excellent, simple plan is shown in proposal No. 55, but no attempt is made to produce an important staircase,

although having much waste space around it. The plan is contrived upon the axis of the angle site, and in certain aspects is crude and inconvenient. A circular colonnade and a dome mark the apex entrance, and a segmental corridor encloses the council chamber. There is too much passage in this proposal, which has much architectural merit, to which the view does scant justice. No. 40 is a remarkable production, which ignores the triangular site altogether. It is a plan formed upon the basis of the main front, and is elaborated with spherical rooms, circular stairs, curved ends to the north and south fronts, and domes by the dozen; it is literally bubbling over with circles and domes, and, apart from prohibitive cost, has nothing to deserve special reference in the award. The first floor plan of No. 80 excites imagination in the possibilities of the main hall and staircase. The planning of other parts is excellent, but we are inclined to think that the author has prejudiced his chances by placing the rates office in the basement, and by losing sight of the question of expense. The exterior is very satisfying, except the circular portico, which is almost detached from the main building, and behind which nestles a balcony for the wearied members of the council. No. 90 is very monumental, and is one of a few competitors who place their council chamber in the corner position, yet keeping the main stairs and entrance in the centre of the Brixton-hill front. The angle is set back, and a curved colonnade end flanked by two sturdy towers is the chief feature in an admirable scheme, which is somewhat overburdened with entrances. The council chamber is again on the angle in No. 97, but too far away from the committee-rooms, and although the building is high above the pavements, the design has merit.

The following are the more important of the schemes which do not receive the assessor's commendation. Scheme B is the better of the two designs sent in by the author of No. 130, which are both of a parallelogram form. Some charming character is given to No. 132 by its steep roofs and the colonnaded recess in the main front; but the plan deserves more mature consideration. No. 126 deserves mention, for it is a good compact plan full of excellent points. The axis is square with the Brixton-hill frontage; the north wing is kept back from the angle extremity of the site, the council chamber in the middle of the composition, and the remaining blocks arranged to maintain symmetry.

As showing the diversity of idea in competition productions No. 138 is instructive. A plan of no merit is given remarkable elevations, whereon the main front has fourteen large segmental pediments and a number of domed turrets, all of which are exaggerated in the perspective view. That the author is not serious is shown by the fact that the gradients in the two streets are indicated the reverse way from what they actually exist. Again, No. 139 has imagined and planned the future town hall much to the discomfort of the plan of the building at present in hand. The perspective view suggests a public place of cheerful purpose. Design No. 98 is illustrated by a delicate coloured view. The general effect is one of great breadth, dignity, and restraint, rather Byzantine in the influence of its massing and outline. The conception is suited to a superior climate than Lambeth possesses, and, unfortunately, the plan does not appeal to the architect to the same extent, and somewhat suggests the work of a collaborator. No. 107 is a scheme with considerable merit. It is a plan based on the axial line, having elevations to the two streets of the same design. The entrance in the centre of each facade is surmounted by a large tower, and the two features thus introduced add materially to the interest and dignity of the whole.

The view of No. 105 is very impressive, although the heavy octagonal tower does nothing. The plan is excellent, and has much to deserve recognition. Committee-rooms and other important departments are placed upon the quieter of the two roads. The perspective view of No. 83 is the colour spot of the show; apart from that there is much that is good in plan, although the main stairs are cramped. The severity of No. 63, wherein a Vanburgh kind of central mass is seen, is an excellent quality. The interiors would gain if the same commendable influence were at work. No. 59 has great dignity in the main block, but the design falls away, as does the building in the lower and smaller parts, arranged at the north end of the site. The

plan has much to repay a study, but it is of a form which disregards the actual shape of the site.

No. 58 is an inconvenient triangular plan, but the design of the central entrance and tower is good. The pencil perspective, which shows design No. 34, is an interesting drawing of a good scheme. The angle tower reaches to the ground, and the brick and stone fronts are excellent. The council chamber at the south end of the main front has perhaps destroyed the chances of success of this composition, for there are incessant noises in this street.

The general intention of No. 51 is most excellent, whereof the elevations have distinction. The plan, too, a parallelogram with two small internal areas and a central entrance with staircase, is fine in parts, but the change in level between the council chamber and the mayor's and committee-rooms is not the most convenient arrangement. But the scheme is another equal, in our opinion, to those placed second and third.

The 3-in. detail in No. 17 promises something very fine, and the perspective drawing quite bears out this supposition. Here the council chamber is in the centre over the main entrance, which is a mistake, in view of the heavy tramway traffic of Brixton-hill. The dome and pedimented recess, containing a large window, add to the excellence of the central group, while the whole composition is enhanced by other good features and by an interesting tower. No. 20 is affected by the Byzantine revival, but only in its fronts; had the same influence been extended to the planning the scheme would receive more comment.

A charming coloured view illustrates a triangular scheme No. 8. The main façade has at each end a pediment crowning an entrance, together with an open circular colonnade. The intervening space has no disturbing element, and the result is one of imposing effect. By a remarkable coincidence the electric tram shown in this picture is seen to possess the same character in solids and voids. The plan is excellent, and, with the public way on the south-west side, the design assumes an island nature. The council chamber and ante-room are separated by a corridor, and the town clerk has a poor outlook, otherwise the scheme is full of merit deserving a better fate.

THE INTERNATIONAL BUILDING TRADES EXHIBITION, ROYAL AGRICULTURAL HALL, LONDON.

[SECOND NOTICE.]

We now turn to Row D, and passing the exhibit of the New Expanded Metal Co., which will be described in another column, we arrive at Stand No. 81, where Messrs. Joseph Richmond & Co. show a hand dinner lift, an express lift for small parcels, an express supper lift, a quarter-scale working model of the Richmond-Carey automatic electric lift operated by push buttons, and an electric dinner lift working up to the roof of the hall. At No. 80 Messrs. Dawson & Co. have a large exhibit of their "Ephos" brown-glazed sanitary ware, including a new stable-gully, rainwater shoes, waste-pipe channels and gullies, etc., in addition to red sand-faced bricks and yellow facing shippers; they also show a number of columns and steps of Echallion marble (white, yellow, and rose), a French marble which they are introducing into this country; mention may also be made of the "asbestos" sheets and tiles for lining walls and for roofing, the material being a mixture of asbestos and cement. Messrs. Stanley Bros. (Nuneaton), at Special Position No. 9, have a large and well-built stack of glazed bricks of various colours, and other examples of their clay ware.

The Rhodes Patent Sash-hanging Co. (No. 79) show a number of ordinary guillotine windows fitted with their patent steel chains and toothed pulleys; the teeth on the pulleys are spaced to fit into the links of the chains.

At the next stand Messrs. B. Ward & Co. have an interesting exhibit of artificial stone columns, balustrades, entablature, and pediments, window dressings, steps, etc., and also concrete paving, terrazzo and marble mosaic flooring, parquet, and wood-block flooring, mosaic hearths, etc. Messrs. George M. Callender & Co. (No. 77) provide an object lesson in proof of the valuable properties of their pure bitumen sheeting; a large shallow tank has been erected, and the floor and walls rendered watertight by means of the sheeting; various methods of facing the

interior of the tank are shown, including white glazed tiles and bricks, and cement rendering.

Near this is Special Position No. 3, occupied by the structure erected by the Crittall Manufacturing Co.; the exhibit includes some excellent examples of wrought-iron work, in addition to iron casements and sashes, stained glass, metal lockers for clothes, etc. The Patent Indurated Stone Co. (No. 76) show balustrades; sundials, steps, etc., in "grey," "light stone," and "brown Portland" artificial stone. Messrs. Diespiker's exhibit at the next stand is one of the most conspicuous in the exhibition; it contains a number of panels in their "patent British glass mosaic," but it is no honour to this country that its name should have been given to such a sham; the panels appear to be ordinary paintings on canvas covered with tesserae of clear glass to give an effect approximating to that of true glass mosaic. Of more interest are the panel of true glass mosaic, the specimens of marble-mosaic flooring, and the red terrazzo steps with inlaid patterns of good design in black and grey. Messrs. Holder (No. 74) have a miscellaneous assortment of well-made paneling, parquet flooring, etc., in Austrian oak, of wrought-iron dog-grates, large dogs, door-scrappers, fire-irons, electric-light fittings, and elaborate railing, and of asphalted sheet-lead damp course, with a model of the Duke-street electric generating station (Mr. Stanley Peach, architect), where it was used for the roof. At the next stand, Messrs. Gunton Bros. (Costessy, Norwich) exhibit a tracery-window in very good sand-faced brickwork, the colour and texture resembling sandstone; they also show a large ornamental chimney-shaft and a parapet in red sand-faced brickwork. Messrs. G. Aston & Son (No. 71) show the "Fram" fire-resisting floors and partitions. The floors have cast arched concrete blocks composed of Roman cement, sand, breeze, and wood fibre, fitted on to the flanges of rolled steel joists, and fixed without centring. The partition blocks are of plaster of Paris, sand, and wood fibre, and have the horizontal joints formed with continuous semi-circular tongues and grooves; "boards" of similar composition are shown for ceilings and for lining the walls of galvanised iron buildings, etc. At No. 70a the Parkstone Steam Joinery Co. (Upper Parkstone, Dorset) exhibit mantelpieces and doors in oak and deal, etc.; and at No. 70 the Rook Manufacturing Co. (Grays, Essex) show samples of their compressed "petrified wood fibre flooring," known as "Rockwood"; the flooring is composed of wood fibre and "petrifying Baralite cement," and is laid *in situ* on concrete.

At the end of Row C the Fire-Resisting Corporation (No. 69) exhibit doors, mantels, paneling, and cabinet-work (painted or polished), constructed of fire-resisting wood; the letter-files in the filing cabinet are of fire-resisting cardboard; an armoured door of the prepared wood, covered with tinned steel, is also shown. The Plaster, Brick, and Stone Co. (Leek) have erected a small building to show the application of their "Pytho" cements, which, like Keene's and some other cements, has gypsum for its basis, but is specially treated to prevent efflorescence. At No. 67 Messrs. Strange & Sons (Tunbridge Wells) exhibit joinery in hard and soft woods, the principal feature being the mantelpieces which are said to have been "especially designed by well-known architects." The "Aro" Fireproof Partitions Co.'s partitions differ from other partitions in the ingenuity of the bonding; the blocks are either "smooth" or "fine-key," the latter requiring only a thin finishing coat of plaster or cement. Messrs. Wenham & Waters (Croydon), at No. 65, exhibit steel and gun-metal casements and sashes, leaded glazing, radiators, sanitary fittings, etc.; and at the next stand the Adamant Co. (Birmingham) show some of the uses of their Adamant plaster and "moulding material," the latter being used for the decorated arch forming the front of the exhibit. The sides of the structure are formed with "Mantada" partition slabs; grouted asphalt for roads and footways, brit-opal tiles, etc., are also shown.

Another fire-resisting partition is that of the London Fireproof Plate Wall Co.; the smooth-faced blocks are said to be of pure gypsum, and may be papered or distempored soon after erection; the rough blocks are of gypsum and breeze, and require a finishing coat of plaster or tiles; tongues, grooves, and holes are formed in the plates, which are grouted together with liquid cement.

One of the few exhibits of wall-papers is that of Messrs. Arthur Sanderson & Sons, Stand No. 62

being jointly occupied by them and the Gilmore Door Co.; the patent doors of the latter firm are well worth inspection, but as they have recently been favourably described in our columns, comment now is unnecessary. The Asbestos Brick & Tile Co. exhibit plain and moulded asbestos bricks in cream, yellow, green, red, and other colours; they are said to be resistant against "frost, rain, smoke or sulphurous gas." At 60 B the Kitchen Bath Fitting Co. (Belfast) show two ingenious and compact combinations of sheet-metal sinks, baths and coppers for workmen's houses; in each case the sink forms a cover to the bath, but in the sink is hinged at the back and lifts up, and in the other it is fixed, the bath being made to turn out on a swivelled outlet prot. The Havelock Patent Partition Co. show partition blocks united by tenons in addition to tongue and grooves. Stand No. 59 contains felt and damp-courses, silicate cotton in various forms, hair and hair fabrics, and a black anti-corrosion paint known as "Siderosthen," which is very flexible and adherent, all of which are exhibited by Messrs. D. Anderson & Son (Belfast).

The room erected by the Cloosene Glas Co. contains examples of their stained glass in window lamps, screens, etc. At the next stand Messrs. J. A. King & Co. exhibit the well-known "Mack" fire-resisting slabs as applied to partitions, floors, ceilings, etc. The most novel variety has red unglazed tiles embedded in the face of the slabs with the joints left open, pointing in order to imitate brickwork; they are intended for the external walls of bungalows, etc. The steel corner-plate for the external angles in plastering is also shown, together with fireproof lathing, etc.

Messrs. F. McNeill & Co. exhibit slabs of wool in a variety of forms, and show its incombustible nature by means of a gas jet burning in a heap of the material. Other useful goods of this firm are felt, various kinds, damp-courses, and a new roofing material known as "roofite," which is said to be free from tar and to have important advantages over other waterproof sheetings. No. 53 Mr. James Brown has a small collection of moulded and ornamental bricks, and Mr. Arthur E. Brown exhibits the Frazzini fire-resisting constructions; the partitions are perforated terra-cotta slabs grooved on the faces; in the floors flat and arched terra-cotta lintels, perforated centring, the joints and girders being protected by similar material; the roof is in texture and true in shape. The Rowland Castle Brick and Tile Works (Rowlands Castle, Hants) show at No. 51 a good collection of pressed and hand-made bricks, and a collection to blue paviers, quarries, ridge-tiles, etc.

At the next stand Messrs. John Knowles & Co. exhibit a large variety of stove-ware, drains, pipes, traps, gullies, closets, etc.; special mention may be made of the "Wyrust" manhole covers, which are designed to prevent splashing; the Y-shaped branches allow a larger number of drains to be connected to a manhole of a given size, and are said to prove useful.

In Row B (No. 48) Messrs. L. B. B. exhibit the "Unique" system of sashes; these are very simple, and are pivoted or hung to separate sashes, and in the usual grooves and project beyond the beads; the "quadrant" door-springs are also simple, the spring works in an annular tube fixed to the frame, and passing through a slot in the upper edge of the door. Messrs. F. & B. Bonten have an interesting display of wrought-iron bars, mouldings, roses, and other ornaments, in addition to wrought-iron sash doors with moulded and enriched panels, collapsible gates, etc. Of more general interest to builders is Messrs. Howard Brothers exhibit (No. 46) of the "Dey" time-register, recording the hours employed by workmen.

A model house is exhibited by Vulcanite Limited, to show their vulcanite roofing, wooden joists and boards; three layers of asphalt sheeting are used with vulcanite brushed on between and above the layers, the whole being protected by a layer of fine gravel. At Special Position No. 45, a designed stand is admirably painted in Ripolin, partly enamel and partly paint. Thomas Potterton (No. 44) exhibits a number of kitcheners fitted with his ingenious "Rea" boilers, in one of the ranges and boilers are provided, the upper part of

water services and the lower (with separate fire) for a low-pressure heating apparatus; the "Victor" gas-boiler and an automatic acetylene gas generator with gas holder are also shown. The Mosaic Manufacturing Co. (No. 42) show good work in marble mosaic, glass mosaic, parquet flooring, leaded lights, etc.; particular attention may be drawn to the decorative "opus sectile" glass mosaic. Heating apparatus for low-pressure hot water and steam are shown at Special Position No. 2 by Messrs. Harley & Sugden (Halifax), including the "White Rose" cast-iron sectional boiler and a variety of wrought-iron welded boilers. Messrs. James Price & Son have a miscellaneous display of well-finished cast-iron "Charlton" baths, lavatories and water-closets, paints, "chez-lui" enamels, etc., and at the next stand the Acton Concrete Partition Co. (S. Acton) show their partition-blocks, which, in addition to the usual semi-circular tongues and grooves, are keyed together at the alternate horizontal joints by means of projections and recesses. Messrs. Medway's Safety Lift and Elevator Co. (Deptford) exhibit self-sustaining and electric push-button dinner lifts, and the gear for an electric passenger-lift. Fire-resisting partitions are again in evidence at the Granite Silicon Plaster Co.'s stand (No. 38), and near this, at Special Position No. 9, Messrs. Durlois show their white and coloured opal tiles, some of which are made to imitate (more or less truly) various kinds of marble. Other opal tiles are shown at No. 37 by the Newellite Glass Tile Co., including curved tiles for the vertical angles of walls, and for the horizontal angles formed by walls and floors. Square-turned muntins and balusters of varied design are exhibited by Messrs. Jones & Leach (Newtown, North Wales) at No. 36, and at No. 34 the South British Trading Co. show the Bardsley oil door-check and spring, which is easily adjusted for right or left doors, and the ingenious "Griffin" folding brackets for supporting flap-tables, etc.

In Row A (Nos. 32 and 33) the Stonwood Fireproof Flooring Co. show their "Stonwood" floor-covering in various colours; the material is laid *in situ*, and afterwards scraped and oiled. Next to this is the stand of Mr. A. Daniels, who shows the roofing and other felts made by the British Felt Co., and the Coolmore Durable Roofing & Asphalt Co.'s flat roof laid on wood boards, and consisting of a layer of felt, a layer of impregnated jute, and an upper layer of felt with mastic between and above the layers, the whole being covered with sand; Messrs. J. Standing & Co.'s "Thistle" sash-lines, etc., are also shown. Messrs. Hunt & Page's patent roller-fixer is worthy of notice, and so also is the hand-made roofing felts manufactured by Messrs. H. T. Rayner & Co. at Retendon (Hants). Messrs. H. G. Goodwin & Son (No. 28) exhibit joinery of various kinds and paper-thatched overdoors, etc., and painters will be interested in Mr. H. E. Kershaw's paint-remover, "Kompi." After passing the exhibit of students' work from the Architectural & Building Trades Department of the Northern Polytechnic Institute, and the builders' barrows and other plant made by H. Blacknell (Fleet, Hants), we arrive at Special Position No. 1, where Mr. William Griffiths exhibits opalite tiling with bull-nosed angle tiles. At No. 24 Mr. James Oates gives practical demonstrations of his useful trimming machines for wall-papers, and adjoining this is the very different exhibit of Messrs. A. C. Potter & Co., who show well-made fittings for tube wells, etc. Messrs. E. Worrall & Co. (Liverpool) show wrought-iron railing and gates of simple character; and Messrs. F. H. Rosher & Co. have a small display of bricks, tiles, artificial stone, etc. Paints (including Velure) are shown by Messrs. C. Cammell & Co., sash-lines and other cords by Messrs. Jas. Austen & Sons, and mastic asphalt damp-courses and roofing-felts by Messrs. L. Lewis & Co. Another of the many fire-resisting partitions is that of the Excelsior & Phoenix Fire-resisting Partition & Ceiling Co. (why do directors select such interminable names for their companies?). There is nothing particularly novel in the blocks; they are made of lime or cement and pumice-stone. At No. 14 Messrs. Brown & Co. (Glasgow) exhibit their ingenious reversible sash-window, and at the next stand the Patent Adjustable Bath Co. show fold-up baths with revolving waste-arms. The last (for first) stand in Row A contains a large assortment of malacca drain-rods made by Mr. H. Hart.

In the "Bays" adjoining Row A there is a

very good exhibit (No. 2) of dovetail-corrugated metal sheeting made by the Fireproof Co., and used in the construction of partitions, floors, flat and arched ceilings and roofs, steps, etc. Trucks, handcarts, tipping waggon, etc., are shown by Mr. H. C. Slingsby, and at the same stand the British Fireproof Construction Co.'s system of flooring with hollow terra-cotta blocks covered with concrete is shown; the floor is very light, and the bottom flanges of the joints are protected by the terra-cotta. Messrs. James Scott & Co. (No. 5) exhibit ventilating fans driven by belt, electricity, and water, air-inlets and exhaust ventilators, gas-governors and burners, "instantaneous" water-heaters for swimming baths, etc. Tipping waggon of various kinds, portable railways, and other plant for contractors are shown by Messrs. Hugh Reid, Griffin & Co. at No. 6, and at the next stand Messrs. Cakebread, Robey & Co. have a trade assortment of sanitary fittings, kitchen ranges, fire-grates, tiles, castings, glaces, oils, colours, etc. The well-known "Shannon" filing cabinets lead on to Messrs. Orenstein & Koppel's large exhibit of portable railways, tipping waggon, concrete mixer, etc. In addition to machinery, Messrs. Swinney Bros. (Morpeh) show a hollow brick partition with grooved faces.

In the wall-spaces on the left-hand side of the hall, the corner stand (No. 125), is occupied by the exhibits of Messrs. Smith & Wellstood (Bonnybridge, Stirlingshire); these include some "Adams" fire-grates and carved wood mantels of good design, portable boilers, cooking ranges, etc., and an ornamental cast-lead semi-circular flange 5 ft. 3 in. in diameter. Messrs. R. Harman & Co. exhibit the "Harman" electric lift in operation, showing its utility for raising building materials. At 127A Mr. James Cornes has an interesting "combined range, copper, and bath"; the copper is placed in a room behind the range, but is heated by a ball-range fire; a low-level cistern fitted with a ball-range governs the supply to the copper, and a draw-off pipe with cock is taken from the latter to the bath. Messrs. Bratt, Colbran & Co. show some well-designed mantels fitted to their simple and effective "Heaped" fires, and the Well Fire Co. (No. 130) have an equally interesting and larger display of their "Well" fires with wood mantels and hammered metalwork, faience, etc.

At the next stand Messrs. Clark, Hunt & Co. show the "Francombe" warm-air register stove in action; it has an air-chamber at the back, and certainly gives out a great amount of heat, but the design is unfortunately so inartistic as to prejudice the sale. They also show "Bailey's geyser boiler-range," in which a boiler is heated by the smoke-fueled from a small self-contained range, and is fed directly by means of a stop-cock on the cold supply; the pipes from the boiler are left with open ends, and hot water is obtained by opening the cold supply stop-cock. A large assortment of hard wood boards and small polished specimens of various woods are shown by Messrs. W. W. Howard, Bros. & Co., and at No. 134 the Carron Co. have a good display of cooking ranges, hot-closets, fire-grates and mantels, stable-fittings, etc. A baker's oven in operation is shown by Mr. F. Wellstead at No. 136, and at the next stand the Brilliant Sign Co. exhibit many kinds of letters and signboards, etc.

The Minor Hall contains a good show of wrought-iron collapsible gates, ornamental wrought ironwork, pavement lights, etc., by the Bostwick Co., a small building constructed with white and coloured lead-glazed bricks by the Gildenburgh Brick Co. (Whittlesea, Cambs.), a room with fibrous-plaster columns, wall-decorations and ceiling in a refined type of late English Renaissance by Messrs. George Jackson & Sons, the "Magic" patent reversible window-balance (an Australian invention recently described in our columns), the "Kleine" patent fire-resisting floor constructed with ordinary rectangular bricks and steel, Messrs. T. W. Palmer & Co.'s exhibit of paling, iron fencing, etc., and Messrs. Rowland Bros. (Fenny Stratford) exhibit of wood gates, oak pale fencing, barrows, etc.

We now ascend to the Gallery, and for convenience will consider the general exhibits in the catalogued order, although this is not the best order in which to inspect them. At No. 21 Messrs. G. & A. Brown have a very good show of modelled and enriched plaster ceilings, friezes, and other decorative work, in addition to wall-panelling, mantels, etc. The Trading & Manufacturing Co. exhibit various kinds of

filing cabinets, and Messrs. C. B. N. Snewin & Sons have a large stack of hard and soft woods in the rough, together with polished specimens. Six stands (Nos. 25 to 30) are occupied by the interesting and varied exhibits of the Art Pavements & Decorations, which include mosaics in marble, ceramic cubes and glass, terrazzo, marbles and marble masonry, tiles, parquetry, and joinery; about 200 varieties of marble are shown, including small and large polished slabs, balustrades, shafts, and two large columns of verde antico; the oak mantel-pieces, marqueterie inlays, and other woodwork are well worth inspection. At the next stand Messrs. W. Carson & Sons exhibit their well-known paints, varnishes, etc., and following this are the electric-wire conduits and fittings made by the Armorduct Manufacturing Co., and the salt-glazed stoneware drain-pipes and fittings, sinks, briquettes and faience fire-places and other manufactures of Messrs. James Oakes & Co. At No. 1 there is an exhibit of parquet flooring and other woodwork by Messrs. Damman & Co.; at No. 2 a wall-ventilator is shown by Mr. W. Edwards (Milford, Surrey), and at No. 3 are blue and red bricks and other clay-ware by the Elstree Brick & Tile Co. (Elstree, Herts), the Stony Lane Brick Co. (Nottingham), and the Erewash Valley Brick, Pipe, & Pottery Co. (Nottingham). Mr. L. Soman shows the "Conus" gas self-lighter and other incandescent-gas appliances, and Mr. J. Percy Day shows the "Eubololith" flooring, which is laid *in situ* on concrete, and resembles cork-carpet. The "Podmore" high-power incandescent lamps and other lighting appliances are shown by Messrs. A. E. Podmore & Co.; bricks, tiles, and other building materials by Mr. J. F. Waycott; stencils, incised fascias, stall-boards, wood and brass letters, etc., by Mr. F. W. T. Hall; fibres and packings of various kinds by Mr. D. B. Hooke; sliding and reversible sash windows by Messrs. W. G. & L. England (Barnsley); shingles, sand, etc., by Messrs. W. & G. Brice (Rochester); colouring materials by Messrs. Brand & Co.'s Successors; ordinary bricks, tiles, ridges, etc., by Mr. J. W. Briggs (Barton-on-Humber); and Portland cement by Messrs. Casebourne & Co. (West Hartlepool). At No. 20 the Perforator Window Co. show Canna's patent sliding reversible windows, the sashes being pivoted on sliding side-stiles. Mr. Edward Leigh (Croydon) exhibits a simple and economical "safety" ladder-bracket, and the Globe Tank and Hurdle Co. (Wolverhampton) show fixed and rotary screens, tanks, etc.; and some ugly sheet-steel chimney cowls are shown by Mr. E. G. Wright (Guildford). At 23A Messrs. G. Shrewsbury & Co. exhibit the "Calds" water-heaters for baths.

Passing some minor exhibits, we come to the interesting stand of Messrs. A. Aubert & Son, containing a finely-designed and well-modelled mantelpiece, and other decorations in fibrous plaster and cartonpiere, which are evidently the work of French artists. The wood-preserving stain, "Solignum," is shown by Messrs. Major & Co. (Hull), and billiard tables and accessories by Messrs. Orme & Sons.

The remaining exhibits in the Gallery are separately catalogued as the "Surrey" Section, and it may be convenient to classify them to some extent according to their nature. Paving materials, including setts and road metal, are shown by the Dean Coverack Quarry Co. (St. Keverne, Cornwall), Messrs. Brooke's (Halifax), the Mountsorel Granite Co. (Loughborough), Messrs. John Wainwright & Co. (Shepton Mallet), the Cleo Hill Granite Co. (Ludlow), Messrs. Darbishes (Penmaenmawr), the Cleo Hill Dhu Stone Co. (Ludlow), Messrs. Field & Mackay (Ludlow), the Grey Royal Granite Sett Co., Blichfeldt & Co., and the Road Maintenance & Stone Supply Co. (Gravesend). There is an interesting exhibit (No. 18) of limestone and Kentish ragstone tar-paving and tar slag macadam in various stages of manufacture by Messrs. Constable, Hart & Co.; tar-paving is also shown by Messrs. A. C. W. Hobman & Co. at No. 9, and by the Erimus Slag Paving Brick Co. (Middlesbrough), and Trinidad asphalt pavement-blocks by the Sanitary Block & Tile Pavement Co. Artificial stone paving slabs are exhibited by the Hard York Non-slip Stone Co. (Halifax) at No. 5, the Patent Victoria Stone Co. (Nos. 1 to 4, Rows B and C), Messrs. John Ellis & Son (Leicester) at Nos. 14 and 15, the Preston Granite Concrete Co. (Preston) at No. 9, Row D, the Imperial Stone Co. at Nos. 24 and 25, and the Patent

Artistic & Artificial Stone Co. (Leicester)—but what "artistic" has to do with the destructor-refuse slabs exhibited we fail to see. Ornamental artificial stone is shown at No. 8 by the Empire Stone Co. (Leicester), and by the Patent Victoria Stone Co., the latter having a large exhibit. The Limmer Asphalt Paving Co. must also be mentioned.

Timber and wood-paving and flooring are represented by the interesting exhibits of the Timber Corporation, Millar's Karri & Jarrah Co., the Acme Flooring & Paving Co., and the Wood-Paving Expansion Channel & Pin Co. Messrs. Hughes & Stirling show a model of their "Sterling" refuse-destructor; the Horsfall Destructor Co. (Leeds) exhibit a complete set of ironwork for one destructor; models of their regenerative refuse-destructors are shown by Messrs. Meldrum Bros. (Manchester), and others by Messrs. Heenan & Froude (Manchester). Sewage purification plant of various kinds is exhibited by Mr. Frank Candy, the Patent Automatic Sewage-Distributors, Messrs. Ham, Baker & Co., Messrs. Geo. Jennings, Messrs. John Smith & Co. (Carshalton), and Mr. H. Birch Killon (Manchester). Drain-pipes and traps and other drainage fittings are shown by Mr. Vernon Parker, Messrs. Freeman & Himes, the Ames-Crosta Sanitary Engineering Co. (Nottingham)—a good and varied exhibit—the Union Pottery (Ashby-de-la-Zouche), Messrs. John Hirst & Son (Cleecheaton)—a new "shoot" for receiving waste-water—Messrs. Ingham's Firebrick Co. (Dewsbury)—the inspection and distributing chamber with three outlets and penstocks is well worth notice, and the white glazed sinks and bricks appear to be of excellent quality, Messrs. George Waller & Son (who show among other things the Bexley cesspool-empter), Messrs. Burn Bros. (who have a varied selection of iron drainage goods), and Messrs. Yarrow & Co. (Bolton).

There are also a number of exhibits of dust-vans, street-watering vans, etc., by Messrs. William Glover & Sons (Warwick), Messrs. W. Constable & Son, Messrs. Chalmers & Co. (Redhill), Messrs. George Rowe & Son, and Messrs. Thomas Baker & Sons (Compton, Berks.).

Of particular interest to architects and surveyors is the zinc process of Messrs. Vincent Brooks, Day & Son, for reproducing drawings and tracings without altering the scale.

Machinery and Concrete-Steel.

Although not very perceptible on casual inspection there is a good deal of machinery scattered among the various exhibits in this year's exhibition. Entering the building by the arcade the visitor will find a small but interesting exhibit by Messrs. Babcock & Wilcox (Stand No. 6), including models of their patent water-tube boiler and mechanical chain-grate stoker for the smokeless consumption of low-grade fuels. These are so well known that detailed description is unnecessary. This firm also exhibit a useful type of tube cleaner for removing incrustation from boiler, economiser, or other tubes, and a model of Guttman's patent water-softening and purifying apparatus. Along the wall near the entrance to the main hall Messrs. Crossley Bros. have a stand (No. 121), on which may be seen several types of gas and oil engines, combined with a dynamo, is used for lighting their own stand, the engine being capable of developing 14.5 h.p. An oil engine, combined with dynamo, forms a lighting set of a type which should be found very convenient for the requirements of private houses, business premises, and small isolation hospitals. The exhibit includes two other gas engines of 1 h.p. and 10 h.p. respectively, and a small suction gas plant. On the next wall space (No. 122) Messrs. J. B. Stone & Co. have a comprehensive display of wood-working machinery, comprising chain saw and pulley mortising machines, dovetailing machines, sand-papering machines, door and sash clamping machines, window frame machines, and other special appliances for joinery work. The "Lockman" four-spindle carving machine is well directed, which special attention may be directed, Messrs. Sutcliffe, Speckman & Co., of Leigh, Lancashire (No. 126), show a collection of brick-making machinery, including an improved type of pug-mill with crushing rollers, a cutting-off table with patent self-lubricating push-board, a Dawber's patent pug-mill mixer with shredding knife, and a toggle lever, double-pressure brick press with oil engine attached; this machine being shown in motion. Their exhibit also includes specimens of lime-sand, gas lime,

clinker, and breeze bricks. A little farther along the wall (No. 127) will be found the "Harman" electric hoist, specially designed to meet the requirements of the building trade. This apparatus is made in two sizes, one to lift 8 cwt. and the other to lift 1 ton, the smaller size only being on view in the present exhibition. The dimensions of the machine are 4 ft. 3 in. by 2 ft. 3 in., and its total weight is 7 cwt. It is fitted with a 3 h.p. semi-enclosed electric motor, controller, main switch, and cut-outs. The gearing is of worm type and has ball thrust bearings, the whole being enclosed in a dust-proof case and running in an oil-bath. Messrs. J. Sagar & Co., of Halifax (No. 129), exhibit wood-working machinery in great variety, one of the most noteworthy appliances being a new pattern builder's power mortising and boring machine, with compensating connecting rods for letting the chisel gradually into the mortise. This will take timber up to 12 in. by 5 in., mortising up to 1½ in. wide, and boring holes up to 1½ in. diameter. Here also are to be seen a "Premier" planing-out-of-twist, jointing, squaring-up, and thickening machine, with hand or power feed, and a vertical spindle moulding and shaping machine for working with the cutters through the spindle in the French style. On Stand No. 133, Messrs. Kirchner & Co. have a selection of sawmill and wood-working machinery, among which is a new pattern hand planer, moulder and variety wood-worker—an extremely handy and thoroughly well-made appliance. A new patent band-saw and improved grinding and sharpening machines are also shown on this stand. Messrs. F. W. Reynolds (No. 135) do not exhibit anything of particular novelty, but their selection of wood-working machinery includes examples of machines of all kinds required by the builder, joiner, and contractor. Messrs. George Anderson & Co., of Carnoustie, N.B. (Nos. 138-9), show a patent granite and marble dressing machine, the essential principle of which is the combination of a small diamond saw with an abrasive disc. The table on which the stone or marble is fixed traverses to and fro like the bed of a planing machine, and is brought in contact with the discs (running at about 2,000 revolutions per minute), with the result that the required mould is speedily formed. To permit the best results to be obtained the table is made so that it can be worked at different speeds, and is so arranged that work of any description can be done upon it. The same firm also exhibit a new type of tubular crane for builders, designed with the object of avoiding mishaps through the dropping of the jib or the load. The tubular form of construction has been adopted for the sake of reducing weight, this being an important consideration in connexion with cranes intended to be used on the top of buildings. On Stand No. 143 are several types of brickmaking machines by Messrs. C. Whittaker & Co., of Accrington. One of these is a semi-plastic repress brickmaking machine, of solid construction, specially adapted for the manufacture of white and buff bricks, as no oil is required to lubricate the dies and so to cause discoloration of the product. This machine is capable of turning out 6,000 bricks daily. Another machine of interest is an improved plastic brick machine, built upon a massive cast-iron bed plate so as to insure rigidity. This machine is capable of producing 25,000 bricks daily. The same firm show a power press for re-pressing plastic bricks, and a specimen of the "Adams" piano wire screen for clay and other materials. Messrs. R. Becker & Co. (No. 144) exhibit several types of Kiessling's wood-working machines, most of which are already familiar to our readers. Special mention may be made, however, of the "outside" four-cutter moulding machine shown this year. All the cutter blocks are easy of access for fixing and adjustment, and safety guards are provided with the machine, which appears to be well adapted for the production of high-class mouldings.

Messrs. Bilbie, Hobson, & Co. (No. 146) can fine attention to the exhibition of a 40 h.p. Stockport gas engine, of new design and fitted with an improved arrangement of valves and a patent horizontal ball governor. A new pattern of Murray's brickmaking machine is shown by Messrs. T. Middleton & Co., Ltd. (Bay No. 1). Two sizes of this machine are on view, one for an output of 20,000 to 25,000 bricks daily, and the other for an output of 10,000 bricks in the same time. In Bay No. 2 the Fireproof Co. illustrate the adaptation of their dovetailed corrugated sheeting, as used in conjunction

with H, T, and U sections, and plastic materials for forming fireproof floors, ceilings, and partitions. The exhibit shows fireproof partitions for curved, straight and irregular work, staircases and lift enclosures, curved and irregular roofs and ceilings, fireproof floors of dovetail sheeting and concrete, suspended and other forms of fireproof ceilings, as well as girder and stanchion casings for protection against fire. In Bay No. 4 Messrs. Barrows & Co., of Banbury, have a very compact portable steam engine, mounted on wrought iron travelling wheels and for carriage, and fitted with a pulley for driving a mortar-mill or other machinery. They also show a portable undereagered mortar-mill, with 6-ft. diameter pan, combined with a vertical steam engine and boiler, the whole mounted on rolled steel girder frame and travelling wheels. Messrs. James Stott & Co. (Bay No. 5) present a good display of ventilating appliances, including electrically-driven, belt-driven, and water-driven fans, and wall and roof ventilators. Their instantaneous water-heater, for the supply of water at any required temperature up to boiling-point, is a most useful apparatus for public institutions, laundries, and manufactories. As originally devised by Major Ballantine, of Manchester, the apparatus consisted of two valves—one for cold water and the other for steam—with a mixing chamber filled with washed gravel. It is now produced in an improved form, with adequate safeguards against the passage of free steam through the outlet intended for the discharge of hot water. Brickmakers and contractors generally will find several things of interest in Bay No. 7, where Messrs. Hugh Reid, Griffin, & Co. display various types of brick cars, tip waggon, a wrought-iron turntable, switches, and sundry requisites for contractors' railways. As usual, Messrs. Orenstein & Koppel exhibit an extensive range of contractors' plant. Their stand, covering Bays Nos. 9, 10, and 11, contains examples of a portable railway track installation, cranes, turntables, steel tipping waggon, brick-drying cars, cars for green bricks, a portable concrete mixer, steel crane skips, and other apparatus of useful character. Messrs. Swinney Bros. of Morpeth, show three revolving pan mills, one with a 4-h.p. engine attached. A special feature of these mills is the segmental bottom, which can be replaced when desired by a perforated bottom for crushing brick and other material used for concrete-making. Another advantage is that any one of the segments can be removed and renewed in case of breakage. The National Gas Engine Co. exhibit a compact electric-lighting set, consisting of a 8-h.p. "National" gas engine direct-coupled to a continuous current dynamo, the output of the set being sufficient to provide for illumination of eighty 16-candle-power incandescent lamps. A new type high-speed gas engine of 1½ brake horse-power is to be found on the same stand, this machine being intended for private house lighting installations. In Bay No. 15 Messrs. E. Page & Co. of Bedford, have a small selection of brick and tile machinery. One of the machines in question is suitable for making round, egg shaped, or octagonal pipes up to 6 in. diameter, plain and corrugated tiles, and solid, perforated, or tubular bricks. The cutting-off table is adaptable for tiles or bricks, and can be adjusted for cutting the material into different lengths. The machine can be worked by one man, and the output is stated at 6,000 2-in. round pipes per day of ten hours. A newly-patented mill for press for wire-cut or sand-faced bricks, and all kinds of roofing tiles, is also shown, this being a compact portable hand-power machine. In Bay No. 16 we find three sizes of the "three-process brick machine, made by Mr. F. A. Smith, of Reading. This type of machine is specially designed to deal with stiff plastic clays, and the chief points claimed in its favour are economy of power, simplicity of design, and solidity of construction. We can pronounce no opinion upon the first of these claims, but the two latter are sufficiently justified by the machines exhibited.

In addition to the ventilating fans mentioned last week, Messrs. Matthews & Yates, of Swinton, show a refuse-collecting apparatus for use in small and joiners' shops. This exhibit shows the mills and rollers picking up the refuse and depositing it into a hopper, the refuse being passed through a separator. The apparatus includes a "Cyclone" exhaust fan, driven by a "Swinton" electric motor of the enclosed type.

Mr. Arthur Koppel has two stands, one in Bays Nos. 22, 23, and 24, and the other in the Minor Hall. The chief objects exhibited are portable railways, tipping waggons, brick cars, an excellent variety of concrete mixer arranged to run on rails and fitted with a self-contained petrol motor, water-softening plant in operation, and a "hydrolocomotive" patent locomotive, running on a track which extends entirely round the Minor Hall. In this part of the building is a useful appliance made by Kennedy's Patent Bending Machine Co., for cold bending tubes to any required angle. The machine consists of a circular cast base, with a smooth face forming the lower flange. The upper flange rises and falls upon a mandril projecting in an upward direction from the centre of the base, the distance of the flange being adjusted in accordance with the size of the tube to be bent. A stop attached to the base serves to hold the tube while being bent, and as it is in contact with the upper and lower flanges during the process of bending, any tendency to bulge or flatten is prevented. A hand lever radiating from the centre of the mandril enables the operator to bend the tube to the required angle, pressure being applied close to the central angle, pressure being applied close to the central angle, pressure being applied close to the central angle. A pin on the same lever enables the operator to adjust the upper flange tightly before bending, and to release the pressure afterwards. Another attachment upon the same lever is a swivel shoe, which, being adjusted to the tube, insures a true set. Several ingenious pieces of mechanism are exhibited by Recorders Limited at Stand No. 5 in the Minor Hall. One is a "Rochester" car-recorder, registering the time of workmen for a week or a fortnight, thus obviating the necessity for transferring the time to a wages sheet. Another is a "Bundy" card recorder, furnishing a printed record of the exact time at which employees arrive and depart. The "signature" recorder is a device specially suited to office requirements, as it provides for registering the time at which all signatures are made by clerks on arrival and departure. The "journey" recorder gives a history of the daily journeys made by any vehicle to which it is attached, showing the time of starting, the duration of all stoppages, the distances traversed between stoppages, the total distance, and the time of arrival home. The "speed" indicator is an instrument intended for use upon motor vehicles, and a kindred apparatus is a combination of speed indicator and recorder, giving a record of the varying speeds attained during the day, the time and duration of stoppages, and the total distance traversed. Messrs. Henry F. Joel & Co. show several sizes of their "Zone" electric motor and dynamo, this type of machine representing an entirely new departure, thus reducing cost and increasing efficiency. The last stand we shall mention in the Minor Hall is that of the Klein Patent Fire-Resisting Flooring, which was fully described in our issue of September 3, 1904. This is really a form of reinforced brick construction, and although comparatively new in this country, it is said that more than 7,000,000 sq. yds. of it have been built abroad.

Turning to the rows occupying the central portion of the Great Hall we may notice in passing a useful form of belt-fastener made by the Clipper Belt Hook Co., of Manchester (No. 19). Messrs. A. C. Potter & Co. (No. 23) show various details of artisan well pumps and appliances, and a direct-acting steam engine suitable for pressures up to 200 lb. per sq. in. Mr. James Oates, of Huddersfield (No. 24), exhibits the "Empire" and "Express" trimming machines in operation, and on stand No. 39 are examples of passenger and dinner lifts by Medway's Safety Lift and Elevator Co. The gear of the passenger lift is operated by means of a hand-switch inside the car, and the apparatus includes over-travelling and slack-rope devices. Messrs. Howard Brothers' time register (Stand No. 46) is an apparatus for recording the time spent by workmen on particular jobs, in addition to the registration of time in the usual manner.

One of the most important exhibits is that of the Columbian Fireproofing Co. (No. 54). The floors designed upon the system of this firm are excellent from the standpoint of fire-resistance, but the form of steel reinforcement used is not the best from the point of view of the engineer, and the manner in which it is applied is not in accordance with the principles governing the design of concrete-steel structures. The only practical disadvantage,

however, is that a certain percentage of the steel is wasted, namely, that which is situated at and near the neutral axis and in the compression areas of the beams and floor-slabs where reinforcement is unnecessary. Examples of concrete-steel pipes for drainage and water supply are also shown by the company, these pipes being constructed in accordance with the Bonna system.

Messrs. Hodkin & Jones, of Sheffield, exhibit examples of their fire-resisting floors, in which the concrete is reinforced by corrugated bars of steel. The bars are placed vertically, so as to pass from the tension area through the neutral axis to the compression area. This system represents a very poor attempt at concrete-steel construction, and one that cannot be recommended. Messrs. Potter & Co. show a panel of their armoured concrete floor, which is formed by embedding thin steel tension rods every 3 in. or 4 in. apart in a flat floor slab of concrete. As the rods are corrugated, a good mechanical bond is secured against slipping. Two other interesting exhibits on the same stand are a specimen of a fireproof floor with steel cradling and lathing for enclosing steel beams, and a concrete-steel lintel, which has been subjected to a load of 10 tons.

Messrs. Joseph Richmond & Co. (No. 81) devote attention chiefly to electric lifts. A 3-in. scale working model of the Richmond-Carey automatic lift shows systems of operation suitable for both passenger and goods lifts, obviating the necessity for an attendant and insuring absolute safety, so far as this is possible with any mechanism. A continuous-running service lift is also in operation, running to the roof of the hall, and there are working models of three types of hand-lift.

Stand No. 82 consists chiefly of the complete framing for a building by the New Expanded Metal Co. No material is more suitable for the reinforcement of concrete than expanded metal, and the framework here erected serves as an excellent demonstration of the manner in which expanded metal should be applied in wall, floor, ceiling, and roof construction.

The exhibit of Messrs. Powers & Deane Ransomes (No. 111) includes numerous sections of structural steel, and a section of their sound and fire-proof flooring showing tiles and joists with concrete filling, and a layer of impervious flooring over.

In the Gallery, Machine Sculpture, Ltd. exhibit a "Wenzel" sculpturing machine at work, carving various materials of different degrees of hardness. This machine has been largely adopted by the stone and wood carving trades on the Continent, and should be found extremely useful for the rapid and economical production of ornamental details for buildings. The greater part of the Gallery is occupied by "The Surveyor" section of the exhibition, a department largely devoted to the requirements of municipal and other public authorities. Messrs. Hughes & Stirling exhibit models of their refuse destructor; the Horsfall Destructor Co., of Leeds, present a complete set of ironwork for one of their furnaces; Messrs. Meldrum Brothers, of Timperley, have on view models of regenerative refuse destructors, and Messrs. Heenan & Froude, of Manchester, exhibit models and parts of refuse destructors and mechanical draught plant. Mr. Frank Candy devotes his stand to mechanical filters, in which the purifying agent is polarite, to a filter for sterilising water by a new process with metallic copper, this metal being afterwards removed and recovered from the water during the process of filtration, and to his automatic regulator for distributing water for irrigation purposes and for controlling compensating waters. Water purification and sewage apparatus are also exhibited by the International Purification Syndicate, the Patent Automatic Sewage Distributors, and other firms. A demonstration of several types of pneumatic tools is given at the stand of the Consolidated Pneumatic Tool Co., where may be seen hammers specially arranged for stone carving and monumental work. Messrs. W. Glover & Sons, of Warwick, exhibit three small petrol engines suitable for driving light machinery, in addition to vans of the type with which their name is associated.

Jonet's safety water elevator, exhibited by the Safety Water Elevator Co., of Dunstable, is a well-gear designed to supersede the old-fashioned windlass, and to cover open wells, thereby protecting them from pollution by the accidental introduction of animal and vegetable

matter. The apparatus consists of a cast-iron plate covering the well opening, and above which is placed a galvanised steel dome perforated at the top for the purpose of ventilating the well. Inside the dome is a shaft and differential pulley, on which works a steel wire, from each end of which a bucket of special design is suspended. The buckets rising alternately into the dome are automatically emptied, and discharge their contents through a spout.

Electric light fittings were shown by the Armorduct Manufacturing Co., Ltd., only. The various types of conduit and the fittings suitable for this method of wiring will be found instructive by those who are not familiar with pipe systems of wiring.

In connexion with putting up steel conduits attention may be drawn to Kennedy's patent bending device shown in the Minor Hall. We were favourably impressed with the ease with which piping could be bent into any shape.

The exhibit of "Zone" motors and dynamos by H. F. Joel will be found of great interest to electricians. The method of constructing electric machines with a single magnetising coil only was absolutely new to us. An inspection of this exhibit will well repay the electrician.

There are several very good exhibits of electric lifts and hoists. Messrs. J. Richmond & Co. show a very instructive model of their new automatic push-button lift, which we recently described in these columns. As they have now fitted up several of these lifts in London, and we have used one several times, we see no reason to alter the favourable impression produced by a study of their patent specification. They show wrought-iron gates of novel design for use with their lift. The gates take up very little room, and will be suitable when the space on the landing is limited. They are furnished with an automatic locking gear. A continuous service lift running up and down to the roof of the hall is ingenious, and is an effective method of advertising.

The exhibition of electric lifts and appliances by Messrs. Waygood & Co. is very interesting. They show a model of their well-known automatic push-button lift. Their automatic electric dinner lift is very simple, and should not easily get out of order. Messrs. Medway & Co. have also a good electric engine. The hand-switch for use inside their lifts is particularly simple.

THE CASE OF GIBBON v. PEASE.

We take the following pithy comment on the above case from the *American Architect and Building News*:-

"There must have been something thoroughly unfortunate in the words or the manner of the counsel who presented the early pleadings in these architect's drawings cases. The attitude, manner, and words of the court testify to an impatient intolerance that seems to indicate that the court's temper had been unnecessarily ruffled. This is unfortunate, of course; and more than this, it seems to us it must have been quite unneeded, for the case suggests that had the simple *argumentum ad hominem* been used the result would have been different. There are distinct points of resemblance between the services rendered by an architect and by a lawyer. In each case the client pays the professional man merely to produce a result—by what means is immaterial and unstated—in one case to create a structure and in the other to win a suit. The lawyer after winning, or losing, his case, never thinks of handing to his client with his bill the brief and pleadings he has used. No, these are neatly docketed and then dropped into the tin box marked with the client's name and stored to gather dust on the lawyer's shelves. Why, then, should the lawyer, when his time comes to sit on the bench, require the architect to deliver over to his client the brief and pleadings—the drawings that is—of which the architect had made use? One would think that the analogy must be apparent even to the legal mind and also the greater commercial injustice of the requirement. The lawyer would rightfully decline to surrender his papers—there is matter therein that may be of service to him later—and yet those particular pleadings would in all probability never be of use thereafter to his client, even be he never so litigious. On the other hand the court requires an architect, who has agreed to perform only a single service, for which service alone he has been paid, to surrender material which enables the duplicating of the service by the client, if he chooses, innumerable times."

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE Annual General Meeting of the Royal Institute of British Architects was held on Monday at No. 9, Conduit-street. The report of the Council for the official year 1904-1905 was submitted and discussed. The report stated that the present subscribing membership of the Institute is 1,904, i.e., 677 Fellows, 1,182 Associates, and forty-five hon. Associates, compared with a total last year of 1,829. During the official year since the last Annual General Meeting fifty-seven Fellows have been elected, sixty-five Associates, one honorary Fellow, and three honorary Associates.

Examinations, etc.

The Progressive Examinations were held in June and November, 1904. The Preliminary was held in London, Belfast, Birmingham, Bristol, Cardiff, Exeter, Glasgow, Leeds, Liverpool, Manchester, Newcastle-on-Tyne, and York; the Intermediate in London, Belfast, Bristol, Glasgow, Leeds, Manchester, and Newcastle-on-Tyne. The Final and Special Examinations were held in London. The number of probationers now stands at 2,305, and of students at 582. The Council regret that so large a number of students remain on the list without proceeding to the Final Examination. The Council, on the recommendation of the Board of Examiners, have given authority to the Institute of Architects of New South Wales to exempt properly qualified candidates from the Preliminary Examination of the Royal Institute, and as a result seven gentlemen residing in Sydney were duly registered as probationers in June last. The first Intermediate Examination held out of the United Kingdom took place last November in Sydney, when three candidates were examined. The Special Examination for Colonial candidates will be held this year in Canada and Sydney.

The annual dinner was not held last year. It will take place this year on Friday, October 13, in Newcastle, under the auspices of the Northern Architectural Association. An interesting programme for the visit will be arranged, and the Council hope that many members will see their way to attend.

Registration.

The Registration Committee appointed last session, and constituted as described in the last annual report, began their labours too late in the session for any effective result, as the Council elections in May very considerably changed the personnel of the Committee. The new Committee early in the present session appointed a sub-committee, which has met monthly, holding morning and afternoon sittings. A Bill for the Enrolment of Qualified Architects prepared by the Sub-Committee with the assistance of counsel has been considered by the General Registration Committee, who have referred it back to the Sub-Committee for emendation. The Registration Committee hope to submit it for the adoption of the Institute at an early general meeting.

Education.

It was mentioned in last year's annual report that the Council had under their consideration the proposals of a committee on Architectural Education consisting of members and non-members of the Institute which they had appointed. The Council have approved of these proposals, and have established a Board of Architectural Education with a mandate to prepare a scheme for the co-ordination of architectural education throughout the country, and to secure, if possible, its adoption in the various schools. Of this committee Sir Aston Webb, R.A., is Chairman, Mr. Basil Champneys Vice-Chairman, Mr. John Slater and Mr. Reginald Blomfield, A.R.A., Hon. Secretaries. It consists of "members," who are all architects, and "advisory members," who are representatives appointed by universities and other educational bodies. The first portion of the task has been accomplished by the Board, which is now laying the scheme before the teaching centres of the country with a view to its adoption.

Public Works and Municipal Officials.

A memorial setting forth the disadvantages to the community of municipal officials being entrusted with the design and execution of architectural works was sent in November last to all the county councils, municipal councils, and district councils of the United Kingdom. The Council, although aware of the improbability of the principles stated in the memorial being at once adopted by municipal bodies, yet

entertain the hope that the prominence with which this important question was brought before them will have considerable influence for good.

The London Building Act.

The Council have appointed a committee, consisting of a sub-committee of the Practice Committee, the Chairman and Hon. Secretary of the Science Committee, the Hon. Secretaries of the Art Committee, and Mr. Lacy W. Ridge, to consider and report to them on all matters connected with the London Buildings Acts (Amendment) Bill now being promoted in Parliament by the London County Council. The Council, adopting the recommendation of the Committee, decided to oppose the Bill in Parliament. A petition was deposited, and Mr. Pembroke Stevens, K.C., and Mr. H. Courthorpe Munroe were retained as counsel. The Committee drafted a detailed criticism of the Bill as instruction to counsel when the Bill should reach the Committee stage in Parliament. Prior to second reading, however, the London County Council dropped the greater portion of the Bill, retaining only the clauses relating to the prevention of fire. The new Bill when received will have the Committee's attention.

Easement of Light Bill.

The judgment of the House of Lords in the case of *Colls v. The Home and Colonial Stores* induced the Joint Committee of the Institute and the Surveyors' Institution to drop Part III. of the Easement of Light Bill which dealt with this subject, and also the only other clause relating to a change in the law, i.e., Part V., headed "Right to Light Passing over Streets," and the councils of the two bodies have approved the omission. The Bill as now about to be introduced into Parliament by Mr. J. Fletcher Moulton, K.C., M.P., is a Bill of Procedure, providing a simple machinery for the settlement of disputes on the lines of that already organised with regard to party-wall cases.

Board of Professional Defence.

Until last session the Council had strictly observed the principle of limiting their advice on professional matters to such cases as were not of a purely legal character. Having, however, considered that it might be advantageous to members if this limitation were modified, the Council have constituted a Board of Professional Defence to consider cases of broad professional interest, to give advice, and, subject to the approval of the Council, to take counsel's opinion on any point, and, if necessary and desirable, to support the architect's case, financially or otherwise, in a court of law. Up to the present time the cases that have come before the Board have not been, in their opinion, of such a nature as to warrant positive action on their part.

Chartered Societies' Protection Bill.

A Bill making it penal for any unauthorised person to use the title or distinctive letters of a chartered institution was introduced last session in Parliament, but dropped. It is again before the House this session. Nine chartered bodies, including the Royal Institute, are promoting the Bill.

Traffic Commission.

In accordance with the recommendation of the Art Committee mentioned in their last annual report, the Council have been in communication with the Royal Commission on London Traffic, urging that the views of expert architects be considered on the laying-out of street improvements. It being too late for evidence to be taken, the Commission have promised that the Council's request shall be borne in mind in the event of any definite scheme for the improvement of London streets being contemplated.

London County Council By-laws with Respect to Drains.

It was mentioned in the last annual report that the views of the Institute regarding the London County Council By-laws as to the deposition of plans with respect to drains had been communicated to the Local Government Board, the London County Council, and the London Borough Council. The Council, acting on the recommendation of the Practice Committee, have issued invitations to those of the borough councils who expressed themselves as being in sympathy with the Institute to join the Practice Committee in a deputation to the London County Council. The Surveyors'

Institution has also been invited to send representatives.

Education of the Public.

On the suggestion of the President, the Council have appointed a small committee to recommend steps whereby the ignorance of the general public in architectural matters may be somewhat mitigated. The Committee have not yet issued their report.

Past Presidents' Portraits, etc.

The Council have had an album prepared containing photogravures of the interesting collection of the portraits of past Presidents. Blank plates have been left for the insertion of future portraits. The price of the album is two guineas.

The presentation of the portrait of Sir William Emerson by Mr. J. J. Shannon, R.A., will take place at an early date. The Council have the pleasure to state that Mr. Solomon J. Solomon, A.R.A., has kindly accepted the commission to paint the portrait of Sir Aston Webb, R.A., Past President.

Appointments, etc.

The Council, at the invitation of H.M. Government, suggested the names of seven architects for the proposed extension of the British Museum. Mr. J. J. Burnet, A.R.S.A., was the architect selected. At the request of the Minister for Foreign Affairs that the Council would advise him as to two architects whose names he might, in response to invitation, submit to the Dutch Government as fitting persons to be invited to prepare designs in an international competition for the Carnegie Foundation—"The Palace of Peace"—at the Hague, and as to a third who could serve on the International jury, the Council nominated the President, Mr. John Belcher, A.R.A., and Sir Aston Webb, R.A., to represent Great Britain in the competition, and Mr. T. E. Colcutt, Vice-President, to serve on the International jury. The Council have since learned, through the Genootschap "Architectura et Amicitia" of Amsterdam, that the Carnegie Foundation Commission have decided to throw their competition open to all architects, while at the same time specially inviting representative architects from the various countries to compete. Mr. W. H. Atkin Berry has been appointed as an additional representative of the Institute on the Committee of the Coal Smoke Abatement Society. The President and Mr. J. S. Gibson were appointed by the Council to represent the Institute on a deputation from various bodies to the Croydon County Council with regard to the proposed demolition of Whitgift Hospital, Croydon.

Bequests and Donations.

The Institute has received a bequest of £100,000, under the will of the late J. T. Wimpers, to be applied to the furtherance of architectural education or the interests of the Institute in any way that may seem good to the Council. Sir Aston Webb, R.A., has presented the first £10,000 with nineteen shares, and Mr. J. M. Anderson with twenty-four shares, in the Architectural Union Company, the income to be applied, at the discretion of the Board of Education, to the furtherance of architectural education. Since the issue of the last annual report the Council have made the following grants:—The Cretan Exploration Fund, 50 guineas; the British School at Rome, 20 guineas; the Manchester Society of Architects, 25s. for educational purposes. They have also voted a grant of 100 guineas towards the expenses of the defendant in the case *Gibson v. Pease* with regard to the ownership of drawings lately heard before the Court of Appeal. They have further voted a grant of 500l. to the funds of the Seventh International Congress, London, 1906, the grant to be spread over two years.

Seventh International Congress.

The Council desire to draw the special attention of members to the importance of this Congress, which will be held in London from July 16 to 21 next year, and to express the hope that it will be loyally supported. To conduct this large undertaking on a scale worthy of Great Britain and British architecture will need considerably outlay, and the Council take this opportunity of expressing the hope that every member of the Institute will contribute to the funds by enrolling himself as a member of the Congress. Following the precedent of the previous six Congresses, there will be two classes of members—contributing members and subscribing members—whose dues are 4l. and

respectively. The Executive Committee are in communication with all the architectural societies abroad and the various foreign sections of the permanent International Committee, and give as all the replies from these have been received will issue a more detailed programme.

Finance.

A statement of income and expenditure, and balance sheet for the year ending December 31, 1904, and the estimate of income and expenditure for the current year are appended to the report. The balance of income over expenditure for 1904, the largest on record, which the Council venture to think is a proof of the general financial prosperity of the Institute. The year had this year invested the sum of £1,000 in the purchase of Cape of Good Hope 4 per cent. stock and 1,000l. in the purchase of Great Northern Railway 4 per cent. Preference stock. The total invested capital of the Institute now amounts to 18,000l.

Reports of Committees.

Reports of the various committees then followed. The Art Standing Committee reported that during the session the Committee have held several meetings and have had under consideration the following matters:—The widening of Liverpool-on-Tweed Bridge; the wood pediment and dome of Somerset House; the commission on London Traffic. The matter of the widening of the fine old stone bridge at Liverpool-on-Tweed has been again before the Committee, and by the courtesy of Mr. Reade & Riley's designs for the proposed works were laid before the Committee, and it was felt that the engineers had, on the whole, dealt satisfactorily with the difficult problem of widening an old structure. In some small matters of detail Mr. Reade kindly consented to consider the suggestions of the Committee, and to bring before it at a later date the detailed drawings for the proposed works. It was felt that the character and interest of the bridge had been safeguarded, and in some measure this had been done in consequence of the action of the Committee. With regard to the present wood pediment and dome on the centre part of Somerset House, fronting the river, the Committee felt that some action should be taken, and accordingly forwarded a resolution to H.M. Office of Works that it was desirable to replace the present wood pediments and drum of the river design. There are no apparent structural difficulties in the way of this being done, and it was considered that a more permanent material would harmonise with the monumental character of the buildings. Beyond a formal acknowledgment of the Committee's report, no reply has been made by H.M. Office of Works, and it is felt that this matter is of such importance as to warrant a further letter being sent to the Office of Works. The Committee forwarded to all the Metropolitan borough councils a communication respecting the abuse of advertisements on buildings with a view to enlisting their support and sympathy, and were gratified to have responses from ten Metropolitan borough councils expressing their sympathy with the objects in view; and a resolution was therefore sent to the London County Council drawing attention to the abuse of many buildings in prominent London streets by being defaced with advertisements which were purely of a permanent character, and requesting that the London County Council should obtain powers to prevent the disfigurement of streets and buildings by advertisements. With respect to the Royal Commission on London Traffic, the Committee suggested that in all future schemes of public improvement for London streets the Institute should be consulted at an early stage with respect to their architectural aspect and development, and it is satisfactory to note that the Royal Commission, in acknowledging the receipt of the suggestion, stated that in future works of this character the Institute would be consulted in the initial stages. Had this been done in the case of the alignment of the north frontage of the Strand Improvement Scheme, it is probable that the view from the west of St. Clement Church would have been preserved; by proposed mutilation half of the west front of the church will be hidden by the new north frontage of the Strand; and it is deeply to be regretted that the advice of the Institute in this matter was not asked.

Among the matters reported on by the

Practice Standing Committee were the new by-laws of the London County Council under the Metropolitan Management Acts Amendment Act, 62 and 63 Vict., c. 15:—"As stated in the Committee's report of last session, the Institute Council, on the recommendation of the Committee, by a circular letter called the attention of the various borough councils to the very onerous and unnecessary liabilities imposed on owners of property by these by-laws recently passed by the London County Council. Since the date of that report eighteen replies have been received from the borough councils addressed, of which nine are more or less in agreement with the Institute, four neutral, and five in opposition. The Committee have therefore recommended the Council to try to arrange a deputation of representatives of the borough councils, the Surveyors' Institution, and the Royal Institute of British Architects to attend on the London County Council and put forward their views."

The question of members of the Institute advertising in newspapers, as practised in some cases in the provinces, was referred by the Council to the Committee, who recommended the Council to take means to prevent or induce its members to discontinue this practice, which they considered derogatory and damaging to the status of the architectural profession. The question of members of the Institute describing themselves as "valuers" and "estate agents" in newspaper advertisements and elsewhere was also referred to the Committee, who reported to the Council that in their opinion nothing further than the description "architect" or "architect and surveyor" was consistent with the dignity of the profession.

The Council referred to the Committee a request by the Institute of Builders that provisions should be made in building contracts by which the charges of county and urban authorities as to extraordinary traffic on roads during building operations should be ascertained by architects previous to the making of contracts, and the liability removed from the shoulders of the contractors. The Committee, however, recommended to the Council that the suggestion should not be adopted.

The Science Standing Committee reported that they have been engaged on standardising the specification and tests for Portland cement, and that the Chairman has attended the meetings of the Joint Standard Committee, and the standard has been fixed and is now published. The Committee are now considering the tests that can be put in specifications when only small quantities of cement are required. The Committee are inquiring into the present method of applying Dr. Angus Smith's solution and other preparations for protecting iron. The Plumbers' Company submitted their second series of diagrams for the criticism of the Committee. The proposal to form a collection of building stones, with full information as to their nature, composition, etc., at the Museum of Geology, Jermyn-street, came before the Committee, and they have recommended the Institute to assist in collecting the information required. The subject of working loads and stresses has been under consideration. The report on the brickwork tests is in print and will shortly be published.

The Report was carried *nem con.*

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The annual general meeting in connexion with the Edinburgh Architectural Association took place on the 26th ult., in the rooms of the Association, 117, George-street, Mr. Harold O. Tarbolton, F.R.I.B.A., the President, in the chair. A vote of thanks was awarded to Colonel More Nisbett for permission to visit Drum House, Gilmerton, and to Mr. Hamilton More Nisbett for acting as leader on the occasion of the visit. Reports by the conveners of the various committees having been given in, office-bearers were appointed for the ensuing season. The elections included the following:—President, Mr. H. O. Tarbolton, F.R.I.B.A.; Past-President, Mr. A. Hunter Crawford, F.R.I.B.A.; Honorary Secretary, Mr. Colin B. Cowrie; and Honorary Treasurer, Mr. Glassford Walker, C.A. Prizes in the associates' section were presented as follows:—Design for a Country House—1, Allan K. Robertson; 2, W. G. Walker Todd; and 3, A. Wilson. Design for a Screen Wall, with Side Porticos—Mr. William Wands. Design for a Font and Font Cover—G. Craston Blechynden. Entrance Lodge and Gateway for Country House (apprentices' competition)—1, D. J. Chisholm; and 2, J. Craston Blechynden. The President then delivered his valedictory address. Speaking of the position of municipal bodies with regard to public works, he said that as that kind of work involved grave interests of an artistic, practical, and financial nature, it was essential that the services of only properly trained and experienced architects should be retained. Architectural work should not be placed in the hands of engineers and surveyors, and the work of the official architect should be restricted to structures of secondary importance, all buildings of a monumental character being entrusted to independent architects, selected in such a way as might seem best to the local authority concerned. With regard to assessors in public competitions, Mr. Tarbolton said that the difficulty lay in the haziness which surrounded the position of an assessor. His duties were certainly ascribed, but there was no recognised rule as to the terms of his employment. He had no stated fees, and the large accounts which were frequently sent in by assessors had naturally frightened many who would willingly seek their assistance. Some clear definition of the obligations of assessorship was wanted. He thought the difficulties might be obviated if the Institute were to appoint a Competition Committee, drawn from its own body and the various allied societies throughout the country. The duty of such a Committee would be to examine competitive drawings and to give awards upon the same. This would encourage promoters of competitions to make these bodies their referees. He recommended the appointment of either three or five assessors instead of one, in which case the award would not only be more final, but would remove the tendency to play up to the idiosyncrasies of a single assessor, whose predilections for certain types of architecture might be well known. Referring to the question of monumental sculpture, he said that in countries where sculpture thrived more happily than in our own statues were seldom placed in the open. They were placed upon the sides of places of moderate size, and when so disposed as to get value from background, whether of stone or of vegetation, they gained vastly in effect. The statues in Edinburgh were invariably placed in an unfortunate position, as if merely dividing the lines of tramcars or other traffic. Alluding next to the ownership of architects' drawings, Mr. Tarbolton said that that was a matter of great importance. He took it that all architects were agreed that unless a special agreement had been arrived at, the client paid for a concrete result, and that the drawings prepared were only the customary means employed by architects for illustrating their ideas for the benefit of the workmen. As such, the client had no more right to them than he had to the architects' office materials. He could hardly find anything quite analogous in other professions. The question recurred again and again in the courts, and it still awaited some final settlement. He did not hesitate to admit the right of a client to the possession of any plans of a pictorial or sketchy nature prepared primarily for the client's benefit, but he did strongly dispute his right to demand the mechanical apparatus set in motion to give certain tangible results.

MANCHESTER SOCIETY OF ARCHITECTS.—At the annual general meeting of the members of this Society, held last week, the following

WESLEYAN METHODIST CHAPEL, GRINDLEFORD.—A new Wesleyan Methodist chapel has been opened at Grindleford. The cost of the work was about 1,700l., the builders being Messrs. Hill Brothers, Tideswell, and the architect Mr. Rowley, of London.

WESLEYAN CHAPEL, LLANDRINDOD WELLS.—The memorial stone of a new Wesleyan Methodist chapel was laid at Llandrindod Wells recently. The building is designed in the Tudor Gothic style, and is faced outside entirely with Yorkshire stone. The tower and spire will rise to a height of about 200 ft. The church has a nave, aisles, and chancel, with organ-chamber. A ladies' parlour, which will seat seventy, and a ministers' vestry is also provided. The seating accommodation of the church is for 600, but the plan is so arranged that the accommodation can be easily increased to 800 in the future. The church and other rooms will be heated on the low-pressure hot-water system. It will be lighted by electricity throughout. The manse will contain dining and drawing rooms and study, with seven bedrooms and convenient kitchen arrangements. The architects are Messrs. Ewen Harper, of Birmingham, and the contractors Messrs. John Dallow & Sons, of Blackheath, Birmingham.

officers and members of Council were elected:—President, Mr. J. H. Woodhouse; Vice-Presidents, Messrs. C. H. Heathcote and J. W. Beaumont; Hon. Secretary and Treasurer, Mr. Paul Ogden; Assistant Hon. Secretary, Mr. George Brown; Members of Council (Fellows), Messrs. John Ely, J. B. Gass, E. Howitt, Jesse Horsfall, A. H. Mills, J. D. Mould, Isaac Taylor, G. H. Willoughby, and P. S. Worthington; (Associates) Messrs. Godfrey Colles, A. B. Corbett, and J. H. Gibbons, A.R.I.B.A.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers held at the Royal United Service Institution, Whitehall, on the 1st inst., Mr. N. J. West, President, in the chair, a paper was read on "The Parade Extension Works at Bridlington," by Mr. Ernest R. Matthews, Borough Engineer of Bridlington, of which the following is a synopsis:—The author stated that the Royal Prince's-parade at Bridlington was constructed about thirty-five years ago, and in view of public requirements, the Town Council in 1903 instructed him to prepare plans of an extension 40 ft. seaward and 212 ft. northward. It was also decided to demolish the Victoria wooden sea defences and to construct a low sea-wall, with terraces, promenades, and colonnades at the back. The contract for the works was let to Mr. George Bell, of Manchester, on his tender for 20,000l., exclusive of a pavilion and other buildings to be erected upon the parade extension, which are to cost about 10,000l. more. The big sea-wall is 355 ft. in length, and the foundations and backing are of Portland cement concrete 6 to 1. The wall is faced with Bramley Fall rock-faced stone to match the old Prince's-parade wall. The new wall is greater in section than the old wall, and it is finished with a cornice and coping. The top of the new wall is 27 ft. 9 in. above the sand level, 29 ft. 9 in. above clay level, 34 ft. 7 in. above the bottom of the foundations, and 17 ft. 6 in. above high-water of spring tides, which reaches a level of 10 ft. above O.D. The bottom of the foundations is 7 ft. 6 in. below O.D. The wall in plan is somewhat of an elliptical curve. The concrete foundations were carried well down into the boulder clay; that portion of the wall which is at the north end of the extension has a vertical face. All face joints in the walls are, pointed with Roman cement; 1½-in. wrought-iron land ties are placed at intervals, and the filling at the back is chiefly sand taken from the foreshore; 6-in. outlet pipes for surface water are built into the walls where required. The author gave the various arguments advanced by engineers in support of different forms of sea-walls, stating that in his opinion a stone-faced wall was the best form of construction. He then proceeded to describe the low sea-wall, which is 455 ft. in length, and is faced with Bramley Fall rock-faced stone and has concrete foundations and backing, as in the case of the big sea-wall. The height of the low sea-wall is 13 ft. above sand level, 16 ft. above clay level, 21 ft. 7 in. above the bottom of the foundations (these being 3 ft. 7 in. below O.D.), and 8 ft. above H.W.S.T. The author then described the special construction of the flights of steps leading on to the foreshore, together with the terraces, retaining walls, and other details. The terraces are paved with 24-in. non-slip flags laid on a bed of concrete. The retaining walls vary in section, but are mostly constructed with brick face and concrete backing, and are surmounted by stone coping carrying an iron railing. The total length of the retaining walls is about half a mile. The widths of the terraces are as follows:—First terrace (the bottom one) 25 ft., the second 20 ft., the third 22 ft., and the top one varies from 20 ft. to 47 ft. Two colonnades have been built on the upper terrace; these are 76 ft. and 97 ft. in length respectively, with open fronts. The roofs are constructed of steel joists and concrete, the surface being covered with Limer asphalt. The extended parade, terraces, and colonnades are lighted by electricity.

BAPTIST CHURCH, SLOUGH.—The new Baptist church, which has been erected in Windsor-road, Slough, was opened recently. Mr. R. W. Moore, of Bexhill, was the architect of the work, the contractor being Mr. H. Flint, of High Wycombe, whose tender amounted to 3,867l.

Illustrations.

COUNCIL CHAMBER, CARDIFF TOWN HALL.

IN this room the seating follows the lines of the architecture, and is arranged in three tiers, with a clear way all round. The portion behind the Mayor's chair is partially screened to form an ante-space, and the corresponding recess on the opposite side is filled with the public gallery.

The walls and ceiling are of painted plaster, and the panelling and seating of oak, with columns in Italian marble.

In addition to the lights shown, there is a large side window, which is the chief feature of the elevation outside; this is to be filled with an architectural and allegorical design in the

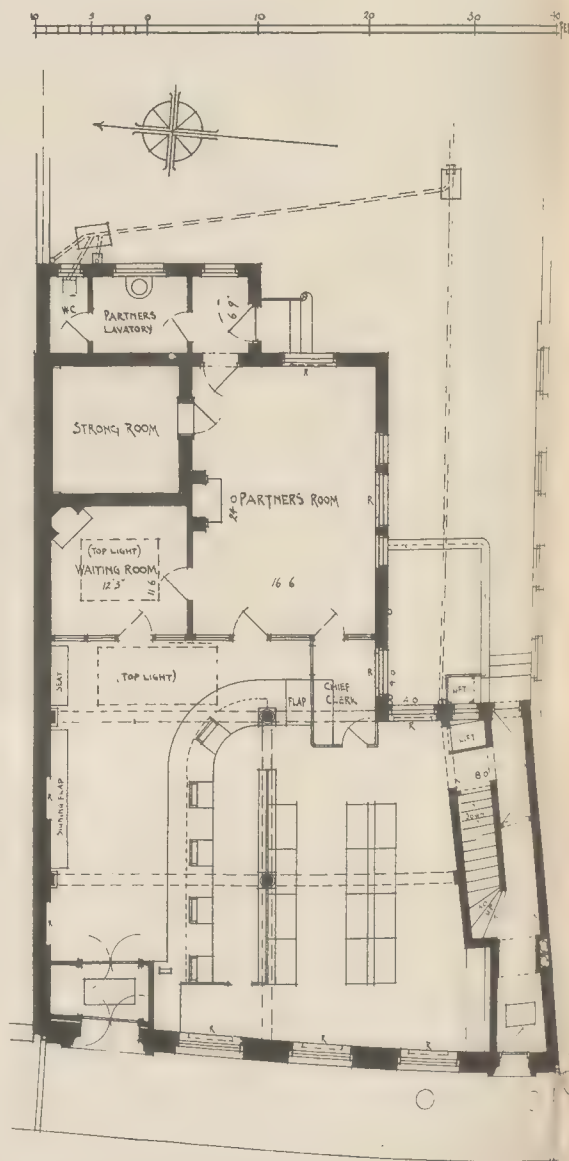
glass. Messrs. Lanchester & Richards are the architects.

BARCLAY'S NEW BANK, CHELMSFORD.

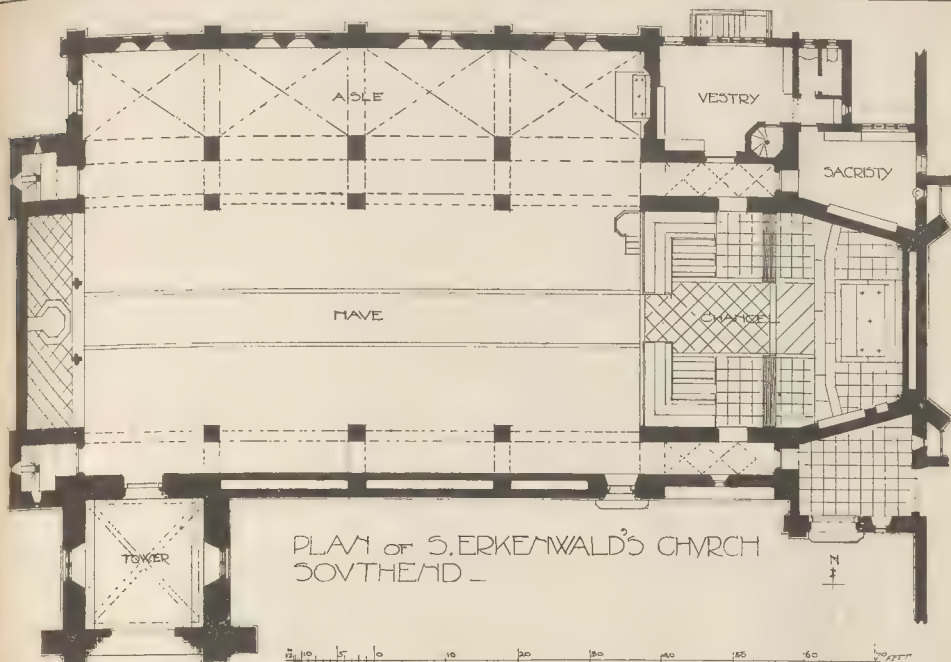
WE give the drawing of this bank which is present exhibited at the Royal Academy. Mr. Arthur C. Blomfield is the architect.

The front is to be entirely of red purpose-made bricks ranging five courses to the foot. The entrances are in Portland stone. The capitals and cornice will be of wood, and will be painted white. The roof will be covered with green Westmorland slates. The ground floor accommodation is indicated by the plan. The basement will be occupied by strong-rooms and clerks' lavatories, the upper floors being occupied as a residence by the chief clerk.

The contractors are Messrs. Ashby & Horne of Aldgate.



Bank, Chelmsford. Plan.



PLAN OF S. ERKENWALD'S CHURCH
SOUTHEND.

CHURCH, SOUTHEND.

We give this week an exterior and interior view and plan of the church of S. Erkenwald, Southend, the architect of which is Mr. W. J. Tupper, of London. The plan and views show the arrangement of the building.

THE OUT-VOLUNTARY.

This was really a first experiment with prepared charcoal (what the French call *fusain*), a drawing material I had not used before, but hope to do something more with eventually. It is a delightful material for effects of black and white, the black being an absolutely dead one, without the rather shiny surface of black pencil. The sketch was sent to the Black and White room at the Royal Academy, but somehow has got hung in the Architectural Room instead, for which it certainly was not intended.

The musical quotation at the foot is from Bach's organ fugue in the Dorian Mode.

H. H. STATHAM.

COMPETITIONS.

HAMILTON PUBLIC LIBRARY.—The plans of this library have been approved by the Hamilton Dean of Guild Court. They have been prepared by Mr. Alexander Cullen, architect, and form part of the whole scheme of municipal buildings and town hall. The site is a commanding one in Cadzow-street. The library buildings are to be placed next the bridge, overlooking Cadzow Burn, and will consist of, on the ground floor, general reading-rooms and lending library. On the upper floor there will be reference library, ladies' reading-room, and lecture hall, while the basement floors will be utilised for storage and lavatory accommodation. The house for the librarian, and the work-rooms in connexion with the library, are placed on the north portion of the site.

NEW SCHOOL AT TAUNTON.—Twelve sets of drawings were received in this competition, the design placed first is by Messrs. Bryan & Roberts, R. Dare Bryan, 5A, Waterloo-street, Taunton-super-Mare, and F. W. Roberts, Hamont-street, Taunton. The second premiated design is by Messrs. Samson & Cottam, Taunton and Bridgewater; and the third by Messrs. Hans Price & William Jane, Weston-super-Mare.

SCHOOLS: AYLESBURY AND WOLVERTON.—New elementary schools are to be erected at Aylesbury and Wolverton for the Bucks County

Education Committee, and in a recent competition for the buildings the assessor, Mr. T. W. Cutler, F.R.I.B.A. (nominated through the Royal Institute of British Architects) has made the following awards:—New elementary school, Aylesbury: First premium, motto "Sunlight," Messrs. John Moir Kennard & Harold Kennard; second premium of £25 to be divided jointly—motto "Celtic," Mr. Alfred Hendy; motto "Star," Messrs. John Cash & M. S. Hack. New elementary school, Wolverton: First premium, motto "Sunlight," Messrs. Harrington, Ley, & Kerkham; second premium, motto "Lux," Mr. F. T. Baggeley. New secondary school, Wolverton: Design adjudged first, motto "Sunlight," Messrs. Harrington, Ley, & Kerkham; second design, "Lux," Mr. G. Sedger.

DAVIES MEMORIAL LABORATORIES, ABERYSTWYTH.—The design, by Mr. A. W. S. Cross, has been selected in the limited competition for the Davies Memorial Laboratories, at Aberystwyth, for the University College of Wales. The work is to be commenced immediately. The estimated cost is about 20,000.

BOOKS RECEIVED.

STRUCTURAL AND FIELD GEOLOGY. By James Geikie, F.R.S., etc. (Oliver & Boyd, Edinburgh. 12s. 6d.)

TWENTY-SIX GRADUATED EXERCISES IN GRAPHIC STATICS. By T. Alexander, M.Inst.C.E.I., and A. W. Thomson, D.Sc., C.E. (London: Macmillan & Co., Ltd. Price 10s.)

MARINE HOTEL, ELIE, N.B.—The work in connexion with the rebuilding of this hotel, which was destroyed by fire about a year ago, has now been completed. The new building is three stories in height, and is lighted throughout by electricity. The contractors were:—Messrs. J. J. & P. M'Lachlan, of Edinburgh, joiners; James Herbertson & Sons, Glasgow, painters; Alexander Finnie, of Edinburgh, plasterer; James M. Symington, Glasgow, plumber; John Kelly & Son, Edinburgh, heating and grates; Charles Brand, Dundee, slater; J. B. Bennett & Sons, Glasgow, painters; Wylie & Lochhead, Ltd., electric light installation and furnishings; and David MacGibbon, Glasgow, electric bells and blinds. Mr. Robert Scott was clerk of works, the architects being Messrs. John Burnet & Son, of Glasgow.

Correspondence.

REGISTRATION.

SIR,—The question of registration—by which is meant the enrolment of architects under Act of Parliament, making architecture a "close" profession, similar to that of medicine—has now, after many years of agitation, become so prominent that possibly the readers of the *Builder* may like the principal arguments in its favour to be set before them by one who has for long been identified with the movement. With your concurrence, therefore, I would say a few words with this object, endeavouring to be as brief as possible.

Primarily, the object which we, who are called registrationists by our friends, have in view is educational. It is our belief that any real advance in English architecture is only to be obtained by laying the foundation of thoroughly sound architectural training. To a certain extent and to a certain few there are facilities for such a training at the present time; but the fact that there is no absolute necessity for training before a living can be earned by practising architecture militates most seriously against the effect of the good work now being done.

It is common knowledge to us all that, while a few are now highly trained, the majority of young architects are untrained, or less than half-trained, some for want of opportunity, some (my experience, at least, suggests that these are very few) for want of capacity, and these are very few for want of compulsion. As an indication of my meaning I would point to the large number of students who pass the R.I.B.A. Preliminary examination, the much smaller number who present themselves for the Intermediate, and the very small residue who eventually take the Final. Yet, almost all have sufficient capacity to pass this severe, but not exclusive, test. They do not—they do not even train for it—because they need not; possibly to their own great regret in after years, when they see all the higher class of work being taken by their better-trained contemporaries; certainly to the great detriment of architecture, in which art, perhaps, more than in any other, sound basis training tells.

It is not, therefore, so much the exclusion of the incompetent from the ranks of practising architects which the Registrationists are aiming at—though this would follow as a natural sequence to at least a large extent—as the compulsory training of all up to a satisfactory minimum of attainment to be deemed from time to time by the responsible leaders of the profession. If it be made compulsory for an architect, before being permitted to practise as such, to pass certain years in

articles and to pass certain test examinations, he will, as a natural consequence, study so as to pass these tests; and if the examiners know their business, as they very soon would learn to do—so the F.R.I.B.A. examiners have learnt to do—real study and real training would be necessary, and not mere mental cram.

I could go on to other points, but feel that this is already a long letter, and that others may very well be trusted to fill in the gaps which I have left, should you open your columns to a correspondence on this important matter.

G. A. T. MIDDLETON.

NOMINATIONS FOR F.R.I.B.A.

Sir,—I find that many Associates have observed with some concern the large number of men who are being nominated as Fellows by the Institute, and it is worth mentioning that, in the latest list of thirty-eight, only fourteen have previously qualified as Associate.

Are we to conclude that the other twenty-four candidates (including those who are still young men, and those who are not specially eminent) are being nominated—for what has been thought to be the more honourable membership—with the approval of the Institute Council? And if so, are we to conclude that the Presidents of the R.I.B.A. and of the allied societies take this means of publicly retracting all they have previously urged as to the importance of the training and education involved in the qualifying examination?

Or are we to assume that this is being done against the real wish of the Council? If so, there are many Associates who have spent time and money in studying and honourably qualifying for membership who will be ready to strengthen their hands. The success of the opposition to a recent Yorkshire nomination of a similar description shows, I believe, that the feeling of the country on the matter is very much stronger than the Council think, and that it is not difficult to keep the standard of membership at a high level.

One thing, at any rate, seems inevitable—we shall have an influx, by the end of the "close season," of several hundreds of Fellows who have never passed any qualifying examination, and the natural conclusion is that the men who, in order to become members, are laboriously studying and working for the Associateship, are fond dreamers and wasters of time, when the same result can be obtained by much less trouble, and even by less guineas. The Fellowship, if it ever had any distinction, can have such no longer.

I should be glad to know, through your columns, if these views are as widely shared through the country as I find they are by Yorkshire Associates and future Associates.

FREDERICK MUSTO.

HOOPED CONCRETE.

Sir,—In your issue of the 8th ult. (page 376) reference is made to the above being now introduced into this country through the medium of a well-known firm carrying on work in this speciality of the building line, and as probably some of your readers interested in the subject may not be aware of the reduction of area made possible by using a "Considere" column, I enclose a rough diagram showing at a glance comparative equivalent areas (column) under compressive stress for various unit values taken for the working load per sq. in. The diagram shown has been partly computed with the help of plotted curves obtained from formulae as given in C. F. Marsh's standard work on "Reinforced Concrete."

The outside section area, shown square with the four corners taken off in moulding same was designed for a column load of 340,000 lb., otherwise 170 American tons of 2,000 lb., or, if reduced to English tons, of 2,240 lb.

$$340,000 \times \cdot 0004464 = 151.78 \text{ tons.}$$

(Reciprocal of 2,240.)

The unit stress on the concrete was taken at 420 lb. per sq. in. This + the stress on the steel reinforcement area shown (viz., $2\frac{1}{2}$ per cent. of the concrete area) divided amongst eight longitudinal rods, required the area as shown; there is no absolute reason why the steel area should not have been divided up amongst four rods, this subdivision resting with the designer, and, as a rule, varies with the different systems employed. The circles marked A are respectively the net area required for a unit stress of 1,000 lb. per sq. in. (inner circle), and the column "finish" (outer circle), on the assumption that the column shall be required to be moulded in any style. This unit stress of 1,000 lb. requires a form of hooping somewhat on the lines of the interior section which depicts a "Considere" column designed for the load mentioned above (340,000 lb.), the area bounded by the spiral hooping being the

net area found by formula (C. F. Marsh) for a steady load as given in words, $P = 2,000$ area of concrete in square inches + 20,000 area of steel (longitudinal rods), P being total column load. This inclusion of a highly-permissible stress on the somewhat small area of the longitudinals effects only a small diminution of the concrete area, which, in smaller diameter columns, is hardly worth consideration unless the steel area is increased. The circle B being the column "finish" if the stress allowed above on the steel longitudinals is neglected in the calculation for area of section. Lastly, superimposed upon the "Considere" column is a typical steel section compounded of two channels and plates forming the usual box section, this being picked at random from a steel section list to carry 169.2 tons (safe load). Perhaps this last comparison is hardly fair to the steel manufacturer of structural sections, but it does show in a remarkable way what is possible to achieve as regards reduction of concrete area, and the writer knows of only one system that the "Considere" column cannot apparently compete with—that is, the solid steel column of a well-known English firm.

The gist of this letter being comparisons, may the writer mention one more in connexion with the subject? A synopsis of experiments on beams of reinforced concrete lately carried out in the States within the past few years has enabled Mr. T. L. Condon to plot the results of all these tests up to the present time, and thus obtain the following equation and values for n :—

$$M = (n P + 56) b d^2$$

where M = ultimate bending moment in inch lb., P = percentage of steel, and n = a determined constant which is apparently 450 for high-elastic limit bars with mechanical bond to the concrete surrounding same, and 275 for plain structural steel bars. This $(n P + 56)$ is what Mr. C. F. Marsh calls the "unit moment of resistance," and if we take for example his value (safe) as given in the table for beams (M. Christophe's value for beams is 285 for 0.8 per cent.), say, for 1 per cent., which is 78.7, and divide the value of $(n P + 56)$ as given above,

$$\frac{330}{78.7} = 4.19$$

or a factor of safety quite sufficient if good work is insisted upon in actual construction. The above equation is also, when plotted for the values of n in respect to P , found to be a straight line curve in both cases. The value

of $n = 450$ is higher owing to high-elastic limit of the steel, and the evident benefit of a mechanical bond as furnished by or through the medium of a deformed bar, such as the "Johnson," "Rancon," "Luster," "De Mann," and others fast coming on the American field of construction pertaining to this subject.

JAMES A. SMITH.

MAPLE FLOORING

Sir,—In reply to the letter of "Constant Reader" in your issue for April 15, maple flooring, as used in solid wood-block systems of flooring, is undoubtedly the best wearing of the hard woods. It is, however, a very treacherous wood, and liable to shrinkage or swelling from variation of temperature and humidity of atmosphere.

Special care is necessary in the selection of the wood, the sawing, manufacture of the blocks, and protection after drying and during transit. Open stacking or loose laying of the blocks in the rooms to be covered and under the conditions of the temperature the room will be subjected to cannot be over-rated.

The covering of large areas may be advantageously assisted by well-secured grooved curbs or battens every 40 ft. or so, and by laying ordinary bond pattern in lieu of berring-bone. This will avoid those irregular heading joints and give better facility for subsequent repair and maintenance.

The specifications and conditions under which this class of work has to be done are usually very unreasonable, and do not lend themselves to a successful result. The allowance for shrinkage should be a specified item (say, 1-20th in., that is to say, joint between any two blocks), and the terms of maintenance should be taken into consideration by the contractor and the building should be in a fair condition when the order for laying is to be acted upon.

BUILDERS' ASSISTANT.

BODMIN CHURCH INSTITUTE.—Viscountess Clifden recently laid the memorial-stone of the Church Institute, which is being erected in connexion with St. Petrock's Church, Bodmin. Plans were prepared by Mr. Menear Oliver, architect, of Bodmin, and the building will consist of a public hall 50 ft. by 20 ft. and two clubrooms, 24 ft. by 20 ft., for boys and for girls underneath. There will also be retiring-rooms, lobbies, etc. The structure will be of local stone, with granite and terra-cotta brick dressings.

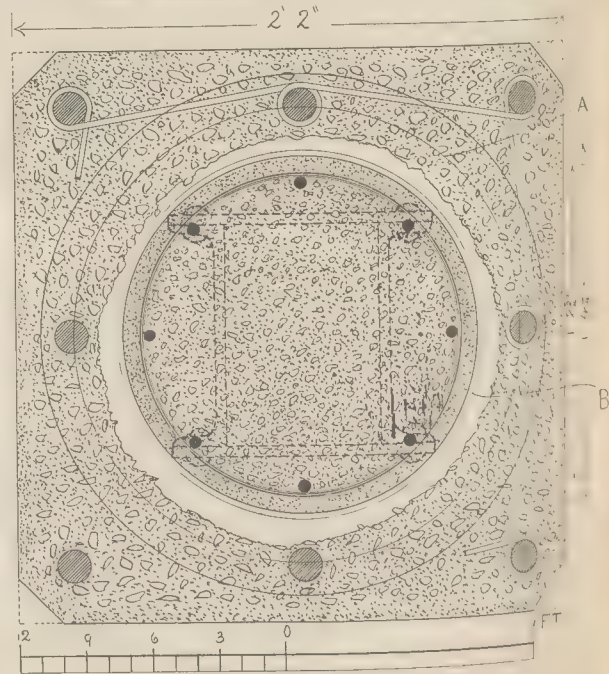


Diagram of Hooped Concrete Construction.

private and general offices—as well as a room—and surveyor's private and offices, and lavatories and cloakrooms. A council chamber is on the first floor. There is also on this floor rooms for the building and rate collector, and a committee room, as well as a lavatory and cloakroom. The top floor has been set aside for the caretaker's residential quarters.

The station includes a room sufficient to store the various equipment, and officers' quarters, cleaning-rooms, and lavatories, as well as a hose tower and look-out.

HALL, SWANSEA.—The foundation-stone of a new mission hall, on Terrace-road, Swansea. The hall has seven classrooms on either side of a central parish hall and classrooms form the main part of the building. The work has been almost completed by Messrs. Lloyd Brothers, contractors, at a cost of 3,000*l.* The proper will be erected under another name, and will seat 550 people. The style is Early Decorated. It is estimated that the completed scheme will cost 8,000*l.*

CHURCH, NEW WASHINGTON.—The new mission hall, at the Gwirth and District Workmen's Social Club were opened on the 4th inst. The contractor for the work was Messrs. Robinson, builder, Washington, D.C. The cost was over 3,000*l.*

SCHEME CROYDON.—The workmen's hall, which have been erected by the Corporation at the junction of Spring Lane, Woodside, were opened a time ago. The cottages are all self-contained, and type "A" comprise a living-room, coal, outside water-closet, and bathroom. There is a small garden at the rear of the house. The living-room is planned with recessed cupboards, with drawers under, and a plate rack over. Portable cupboards have been fixed, and the chimney-places, including shelf, are constructed of solid masonry. The scullery has a foot-cupboard, and a strong brown-glazed brick bearers, and a cement dado 5 ft. high, and are divided into solid patent fireproof partitions. Both bedrooms have cupboards. Type "D" bedrooms have cupboards. The workmen have all planned in a similar manner to the others, and comprise a parlour, living-room, scullery, with bath, portable copper, and outside water-closet, and three bedrooms, and are provided with passages leading to the parlours and living-rooms. The cupboards in this type is placed in the room. In both types the sculleries and bedrooms have a flat concrete roof. Over the top of all the houses there is an artificial canopy supported on corbels. The total rental of the eighty-six houses and one shop being estimated at 23,350*l.* The whole scheme was completed and superintended by the Borough Engineer, Mr. Eric R. P. Hird, who has been in charge of the work.

WORKHOUSE EXTENSIONS, ECCLES.—At a recent meeting of the Ecclesall district the plans, prepared by Messrs. P. Hird, for the erection of dayrooms, lavatories, etc., on the women's side of the house at a cost of 5,050*l.*, were adopted.

THE INSTITUTE, NORTHAMPTON.—The new building of the St. James' Church Institute, Northampton, have been erected in Spencer Bridge-road, Northampton, were recently opened. The architect was Mr. Eric R. P. Hird, who has been in charge of the work. The cost is about 1,250*l.*

THEATRE, COLCHESTER.—With reference to a paragraph in our last week's issue that this theatre, which was opened in Easter, had been erected from designs by Mr. J. W. Start, of Colchester, we are pleased to state that the plans were presented to the offices of Messrs. Kirk & Kirk, of London, and on the 1st inst. the negotiations were completed. Mr. Paul Hoffmann, of Broad-street, E.C., was appointed consulting architect on behalf of the parties concerned, and the building was started in accordance with certain alterations suggested by him.

PAINTED GLASS AND DECORATION.

MICHAEL'S, BARNES.—Two single-light windows were unveiled in this church on 4th inst.: one the gift of the school and the other of the priest in charge. The windows represented are "Christ, the Good Shepherd" and "Christ, the Good Shepherd." The series of lights, upwards of 100 in number, were executed in this church by Messrs. J. D. Bacon & Brothers.

SANITARY AND ENGINEERING NEWS.

SEWERAGE SCHEME, SOUTHPORT.—In the Mayor's parlour, at the Southport Town Hall, on the 26th ult., an inquiry was held by Mr. A. A. G. Malet, M.Inst.C.E., and Mr. H. Timbrell Bulstrode, M.A., M.D., into an application by the Town Council for power to borrow 35,000*l.* for the purposes of sewage disposal. Mr. J. Ernest Jarratt, the Town Clerk, conducted the case for the Corporation; the Preston Town Council and the Preston Port and Harbour Authority were represented by Mr. Henry Hamer, the Town Clerk, and Mr. James Barron, the Ribble engineer. The Town Clerk stated that at present the sewage of the borough was discharged into the Crocens Channel by works constructed in 1878, supplemented by a small pumping station erected seven years ago. During the last twenty-five years there had been a gradual rise in the level of the foreshore, and the invert of the outlet was now 4 ft. below the level of the channel. Consequently the sewage could not be discharged at the level originally intended, and, at certain stages of the tide, the sewage backed up the main sewer. The cost of the pumping station was met out of revenue, but the cost of the land was included in the present application. It was now proposed to construct works capable of dealing with 18,000,000 gallons of sewage per day—nine times the volume of the present dry-weather flow; there would be six pumps (two of them stand-bys), a series of detritus and sedimentation tanks, and fifteen filter beds, and the effluent could then be turned into the channel at all states of the tide, except on the highest tides of the year. Evidence was given by Mr. R. P. Hird, the Borough Engineer, and Mr. G. Chatterton, engineer, and others.

RAILWAY VIADUCT, FERRYHILL, ABERDEEN.—The widening of Ferryhill railway viaduct, which forms the first section of work preliminary to the extension of the Joint Station, and was entered upon by the Caledonian Railway Company in March, 1903, has now been completed. The viaduct, which is about 412 yds. in length, consists of thirty-nine spans, including the two bridges at Wellington-road and Millburn-street. The structure, which is built on a south-easterly curve, is faced with the native granite. The body of the ordinary arches consists of five rings of brickwork, including the blue brick facings, while the haunching is of concrete. The works were designed by Mr. D. A. Matheson, Engineer-in-Chief of the Caledonian Railway Company, and the principal contractors were Messrs. Morrison & Mason, Ltd., Glasgow, the sub-contractors for the steelwork being Messrs. Sir William Arrol & Co., Ltd., Dalmarnock Iron Works, Glasgow, and the resident engineer under whose supervision the work was carried out was Mr. W. A. Kemp.

THE GAULNESS VIADUCT, NEAR BISHOP AUCKLAND.—The rebuilding of the viaduct over the River Gaulness and the Haggerleaze branch railway is now nearing completion. The whole of the work is being carried out by the district engineering staff of the North-Eastern Railway, with the exception of the steelwork, for which Messrs. J. Shewell & Co., Albert Hill, Darlington, are the contractors. The undertaking is under the direction of Mr. C. F. Bengough, North-Eastern Railway District Engineer at Bishop Auckland.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—Mr. W. H. Wrightson has entered into partnership with Mr. T. H. Baker, architect and surveyor, of London, Colchester, and Clacton-on-Sea. The style of the firm is "Baker & Wrightson, architects and surveyors, 21, Liverpool-street, E.C., and Clacton-on-Sea."

THE GILMOUR HARDWOOD DOORS.—These are a Canadian invention, and have already been mentioned in our columns in connexion with one of the industrial exhibitions. The core of the framing is built up of a number of small pieces glued together and so arranged as to prevent warping; the surfaces of the core are grooved, the grooves being rectangular, $\frac{1}{8}$ in. wide and 1-16 in. deep and $\frac{1}{8}$ in. apart. The hardwood facing is 3-16 in. thick, and is grooved on the back exactly similar to the core, so that the ridges in the one fit into the grooves in the other. Heavy steam-heated rollers are used to roll the hardwood face to the core, so that surplus glue is squeezed out along the grooves and perfect adhesion is secured. The panels are built up of five thicknesses of wood, laid with the grain alternately vertical and horizontal to prevent warping. Only the outermost layers are of hardwood. Solid hardwood mouldings are planed around the panels, and also (in some of the designs) on the rails. For hospitals, a special door is made without panels or projections of any kind and without visible joints; this is an excellent

piece of work, and has the appearance of a solid plank, without its disadvantages. The catalogue we have received contains coloured illustrations of doors of different designs, the prices being given in each case. Among the woods used are oak, teak, birch, and mahogany.

OPEN SPACES.—The acquisition, at a cost of 48,000*l.*, of the Sanders Estate, of about 24 acres, at Denmark Hill, is now practically assured, the London County Council having agreed to contribute 25,000*l.*, whilst contributions and private subscriptions are promised to a total of 23,000*l.* The contributions comprise sums of 10,000*l.* from the Camberwell Borough Council, 5,000*l.* from the Lambeth Borough Council, and 2,500*l.* from the Southwark Borough Council; the park is to be vested in the London County Council, who will lay out the ground, and erect the fencing, at a cost of about 5,500*l.*—The Archbishop of Canterbury will continue the arrangement made by his predecessor in the primacy, whereby a portion of the grounds of Lambeth Palace are reserved for the enjoyment of the public.—The extension and completion of the laying-out of Mountsfield Park is being proceeded with by the London County Council at an outlay of 2,115*l.*—Proposals are made for planting portions of the vacant ground or "waste" along the sides of Mile End-road as a boulevard or garden, for which the width of the thoroughfare is well adapted.—The Metropolitan Public Gardens Association have agreed to undertake the laying-out of the proposed recreation ground in Varcoe-road, subject to one-half of the expense being defrayed by the Camberwell Borough Council, and have under consideration a scheme for the preservation, with the co-operation of the Surrey County Council, of Purley Beches, near Croydon, which it appears could be secured for 5,500*l.*—In terms of an award drawn by Mr. G. Pemberton Leach, an Assistant-Commissioner of the Board of Agriculture, the claim advanced by the Guildford Golf Club to the sole right to play golf and to maintain links on Merrow Downs, near Guildford, is allowed, and the claim is allowed of Lord Onslow, as lord of the manor, to exercise certain rights as to pasture, cutovers, soil, timber, minerals, and so on. The scheme for the regulation of the Downs as an open space was recently promoted by Lord Onslow and the residents, and the Guildford Corporation, the Golf Club, and others agreed to contribute towards the yearly maintenance.

The annual report of the Epping Forest Committee sets forth that steps have been taken to obtain contributions from the local district authorities towards a sum of 2,000*l.*, to be spent upon arresting the continued depletion of water in the heronry and perch ponds in Wanstead Park, and that the enlargement, to a total extent of 13 acres, of the Hollow Pond has been effected at a net expenditure of 1,215*l.*, which will be recouped by the sale of gravel, sand, and soil.

CHANGES IN CRAIG'S-COURT.—The office of the Royal Almonry has just been removed from No. 6 in the court to Engine-court, St. James' Palace. On the demolition of the Queen's Treasury, Whitehall, illustrated in our last week's number, p. 466, *ante*, the business of the Royal Almonry was transferred to Spring-gardens, and thence, fourteen years ago, to Craig's-court. In the course of June next will be offered for sale the freehold properties consisting of Harrington House, and Nos. 8, 9, 9A, and 10 in the court, together with No. 21, Charing-cross, the whole covering more than 9,000 ft. superficial. Harrington House, No. 4, extends over nearly the entire east side of Craig's-court; it is a large and handsome mansion, belonging to the Dowager Countess of Harrington, but it has been unoccupied during some while past. The house which afterwards became the Census Office was adapted in 1840 for a collection, made at Sir H. De La Beche's instance, of specimens gathered during the progress of the geological survey of the United Kingdom, which formed the nucleus of the Royal Geological Museum.

PUBLIC WORKS IN THE SOUDAN.—The Earl of Cromer, reporting on the administration of the Soudan in 1904, writes:—A sum of £227,000 was spent during the past year on the construction of civil buildings in the Soudan. During the first few years after the reconquest of the country a large number of mud-brick buildings had to be hurriedly constructed to accommodate the officials and troops. These buildings were run up under the superintendence of the Egyptian staff of the Public Works Department, which was composed entirely of military officers without any previous technical training. These mud-brick buildings were only of a temporary character. In all districts where there is a heavy rainfall, such as the Blue Nile, Kassala, and the Upper Nile Province, they are being replaced by permanent buildings. There are now twenty-

four stations where permanent building works are in course of construction. Special grants of money have been made for the better housing of officers, officials, and troops in fever-ridden districts throughout the country. Captain Kennedy, R.E., the Director of Public Works, writes:—"In the case of many of the out-stations, such as El-Obeid, Bara, Gallabat, Kassala, Gedaref, etc., the difficulty and expense of constructing permanent buildings is very great. All the building stores, such as doors, windows, girders, etc., have to be transported long distances by camel, and, in many cases, even fuel, wood for burning lime and bricks, has also to be transported. This not only enormously increases the cost of building, but also ties us down very much as regards design, as we are restricted, in the case of girders for roofing, etc., to loads which can be transported by camel. Till wheeled or other mechanical transport is introduced, the cost of conveying heavy stores or machinery to these out-stations is practically prohibitive." With the extension of the railway system, some of the difficulties to which Captain Kennedy here alludes will, it may be hoped, shortly disappear; but some time must yet elapse before any great improvement can take place in the communications with some of the more remote of the outlying stations.

EXPENDITURE ON PUBLIC BUILDINGS IN EGYPT.—The following reference to this subject is made in the Egyptian Blue Book for 1904:—"Large sums of money have, of late years, been spent on public buildings in Egypt, but it is to be feared that a considerable time must yet elapse before it can be said that the country is adequately equipped in this respect. It is somewhat singular that this should be the case, for a spendthrift government, such as that which formerly existed in Egypt, generally displays its wastefulness notably in building. This is what Ismail Pasha did. He spent enormous sums of money in the construction of huge useless palaces for himself and his family, some of which are now used for public purposes. They are, however, for the most part, so badly built, besides being very inconvenient, that the cost of maintaining them in a moderate state of repair is excessive. In many cases, it will be an eventual economy to pull them down and rebuild. That the progress of the country is, in many directions, being retarded by the want of suitable public buildings cannot be doubted, but the want is one which can only be gradually supplied. Apart from the difficulty of providing speedily the very large sums of money required, it is to be observed that close supervision and control, which are essential if proper economy is to be enforced, can only be exercised over a limited amount of work. Nevertheless, the financial freedom of action now acquired by the Egyptian Government, will enable somewhat more rapid progress to be made than heretofore. The grant for buildings made to the public Works Department in 1904 was £128,000. With this money, good progress was made with several important buildings; notably, the Central Fire Station, and the Sanieh Girls' School at Cairo, were completed. Each of these cost £24,000. The grant for 1905 has been increased to £180,000. The funds available for maintenance have also been increased by £54,000. There is, therefore, every reason to anticipate a great improvement in the direction of keeping Government buildings in a proper state of repair. The practice formerly adopted of stinting maintenance funds, far from being economical, led in the end to high expenditure. In spite of the fact that, since 1891, no less than £1,600,000 has been spent from the reserve funds on public buildings, the legitimate demands under this head are still very numerous. The Government offices in Cairo are very inconvenient. Moreover, they were originally so badly built that new offices have become an almost inevitable necessity. The cost of maintaining the present buildings is excessive. The prisons are still overcrowded, and the provision for lunatics is so inadequate as to necessitate the discharge of many persons who should be under restraint. Another school for secondary education is required. An improved technical school, to take the place of that now established at Boulac, must certainly be built before long. If industrial education is extended, a school, modelled on that recently built in Cairo, should be erected in every large provincial town. Little or nothing has as yet been done in the way of providing proper accommodation for the many village schools which are dotted all over the country. A school is required for police cadets, and the War Department has urged that more money should be spent to provide suitable barracks for the troops at Alexandria.

AN OLD MANCHESTER CONDUIT.—In the course of excavation of the road in New Brown-street, a relic of the primitive water supply

of Manchester was disclosed. It consisted of lengths of tree trunks, hollowed out and fitted together to form a wooden conduit. The joints were formed by the thinning of one end of a trunk so as to fit into the opening of the one immediately succeeding. The pipe bored through the wood is, roughly, about 4 in. in diameter. The conduit is supposed to be 150 or 200 years old. As the point of discovery was the corner of Sugar-lane, it is conjectured that the pipe conveyed water from one of the springs in Spring Gardens to some residence in the neighbourhood of Shudehill. A similar pipe is said to have been found some years ago, and this appeared to have conveyed water along Moseley-street and Princess-street to a house in the vicinity of the present Whitworth-street.—*Manchester Guardian.*

DIRECTORY OF ENGINEERS, IRON AND METAL TRADES.—Kelly's Directory of Engineers, Iron and Metal Trades, and Colliery Proprietors for 1905 (Kelly's Directories, Ltd., 132-4, High Holborn, W.C.), maintains the standard of excellence of previous editions. The work is arranged on the plan of the "Building Trades Directory"—another excellent work issued by the same firm—and it includes the names and addresses of firms and others in England, Scotland, and Wales, and the principal towns of Ireland, the Channel Islands, and Isle of Man in any way connected with the above trades. There are nearly 2,000 pages of information, clearly arranged and printed, and the information sought for can easily be found. The present is the tenth edition of the work, which is published at 30s.

THE BRITISH FIRE PREVENTION COMMITTEE'S SUMMER SESSION.—The British Fire Prevention Committee's testing station will shortly be moved from Bayswater to a site within easier access from the West-end. All the testing chambers to be erected at the new station will be of the larger type recently adopted by the Committee, with provision for dividing them into compartments. Besides the tests already announced, a floor test and a partition test have been applied for on behalf of the National Fire Proofing Company of the United States, and a door test by the Gilmour Door Company of Canada. There are now four floor tests, two partition tests, two door tests, and one wired-glass test in preparation for the Committee's summer session. The official reports on the Autophosphorene Automatic Fire Alarm System, and on the Adamant Company's partition tests will be issued early in May. A publication, dealing with recent testing operations in America, is also in preparation for issue in May. The number of new members who have joined the Committee during the past four months of the current year is sixty-seven.

NORWICH SHIRE HALL EXTENSION SCHEME.—A special meeting of the Norfolk County Council was held recently at the Shire Hall, Norwich, to consider the report of the Shirehouse Extension Committee. Among other things the report stated that the proposed building is to be erected upon the vacant land on the south side of the present Shirehouse, and intending competitors are to assure themselves of the exact dimensions of the site. It is believed that this land forms part of the old castle moat which was filled up to the present level, consequently there would be a very considerable depth of made ground. The entire cost of the additions is not to exceed 12,000l. The whole of the drawings are to be drawn to a scale of 1-16th in. to 1 ft., finished plainly in colour, and with dimensions clearly given. No perspective drawings to be sent in. A deposit of one guinea will be required from each applicant for the conditions, such sum being returned on receipt of a *bona-fide* set of drawings. Each competitor must forward with his designs a tender from a reliable contractor, undertaking to carry out the works within the amount above specified. As it is possible that at some future time the front portion of the centre block of the present Shirehouse may require to be rebuilt, competitors are requested to note this in planning the proposed extension. The following accommodation would suffice, viz.:—Secretary's private room, 300 sq. ft.; two rooms for clerks and stores, 400 sq. ft. and 200 sq. ft.; assistant-secretary's private room, 300 sq. ft.; clerks' room, 400 sq. ft.; assistant-secretary's private room, 300 sq. ft.; two rooms for clerks and stores, 400 sq. ft. and 250 sq. ft.; total, 650 sq. ft.; accountant's private room, 300 sq. ft.; two rooms for clerks and stores, 400 sq. ft. and 250 sq. ft.; total, 650 sq. ft.; surveyor's office, 300 sq. ft.; assistant-inspectors' office, 300 sq. ft.; committee-room, 500 sq. ft.; three storerooms, 400 sq. ft. each; total, 1,200 sq. ft.; general waiting-room, 250 sq. ft. Total, 6,050 sq. ft. The Earl of Kimberley moved the adoption of the report, and Mr. B. S. Stanger seconded the motion. Mr. T. Cranmer moved, as an amendment, that the words, "That the entire

cost of additional building to the sum of 12,000l." be eliminated. Seconded. Mr. H. seconded, and the amendment was carried by a large majority. The report, after some further discussion, was adopted as amended.

BOOTH'S RAIL JOINT.—A new type of joint for tramway rails has been patented by Mr. Booth, of Sheffield, who claims that it constitutes a rail-joint chair and sleeper in one. Instead of the customary fish-plate, the inventor uses two pieces of light gauge angle section, the horizontal limb of the angle being prolonged and cranked so as to provide for the attachment of a flat plate placed under the bottom of the rail ends to be joined. The two angle-plates are connected with the rails by six bolts as usual, and with the bottom plate by six rivets on each side. So far as we can see, the chief advantage of the joint is the large bearing surface provided between the rail. This will no doubt have the effect of reducing vibration and jolting, and of permitting the rails to be more effectively tilted as is sometimes necessary on curves. It is as if the combination dispenses with the necessity for sleepers, and instead of shorter chairs may be applied between the points. The suggestion that the joint permits the use of "narrower rail flange" is not a good one in view of the fact that the Engineering Standards Committee—with the co-operation of all the leading tramway experts in the Kingdom—have already settled a definite series of standard sections, in which the dimensions of flanges are limited to two sizes only. Fish-plates were standardised at the same time, and, as they are much more convenient for general use and more readily obtainable than this special form of joint, the inventor will have to demonstrate superiority very conclusively if he hopes to secure the adoption of his device to any considerable extent.

ROYAL MILITARY SCHOOL, CHELSEA.—Upon completion of the new buildings at Dover, erection of which will shortly be begun, the present buildings in King's-road, Chelsea, will be vacated by the pupils and staff of the Duke of York's Royal Military School. They were erected in 1801-2 after designs by John Soane, and it is expected will be altered for conversion into barracks for infantry troops belonging to the London District garrison. The new buildings at Dover will be erected upon a site at the rear of the Castle, and will be planned as separate blocks, with recreation and playgrounds, swimming-bath, gymnasium, &c.

BLOOMSBURY BAPTIST CHURCH.—A new Central Mission is about to be established in Bloomsbury, with its headquarters in the chapel, which will be adapted for purposes of sisterhood and the institute. The chapel stands in what was formerly Charlotte-street, and is now the northern end of Shaftesbury-avenue, was built for Sir Morton Peto, the plans and designs made by John Gibson, the outer walls constructed of white brick, and dressings of Caen stone, and two lofty spires. The edifice is illustrated in the Builder, April 15, 1893.

CAPITAL AND LABOUR.

NEWCASTLE BUILDING TRADES DISTRICT.—A strike in the building trade has commenced. On Saturday, the men affected by the strike were masons, bricklayers, and labourers—over 100 in number. The number of the employers who are willing that things should go on as they were is not definitely known. The plasterers on Saturday received the notice they had sent out to employers whom they had been informed were desirous of continuing the old rules, and the number so received, we were told, was a good one. Of course, it would be a breach of confidence for the employers who have divulged the names of the employers who have so signified. The plasterers approximately estimate the number of men that will be out of work at 150. The district affected is Newcastle-upon-Tyne, Wallsend, Gateshead, and up to Burn.—*Newcastle Chronicle.*

EDINBURGH JOINERS' STRIKE.—No change in the connection with the strike among Edinburgh joiners was reported at the meeting of the men on the 1st inst. The non-union men of the strike were paid at the rate of 6s. for married men, and 6s. for unmarried men.

GLASGOW TRADES DISTRICT.—A meeting of the members of the Glasgow Trades and United Operative Plumbers' Society of Great Britain was held on the 1st inst. in the Alexandra Assembly Hall, the United Society of 400 men, all members of the district, are stated to be idle, the members of the Scottish Society having agreed to work at the reduced rate. A strike committee was appointed. There is still no prospect of settlement between the joiners and their employers.

Legal.

CASE UNDER THE LONDON BUILDING ACT, 1894.

FEES FOR TENEMENTS.

On April 28, at Lambeth Police Court, before Mr. Francis, Messrs. Frampton & Shephard, appeared Mr. Ellis Marsland, District Surveyor for the District of Camberwell, for the recovery of fees due in respect of twenty-eight houses erected by the defendants for the Camberwell Borough Council. The houses were situated in Onglander and Gifford roads, two of the number were single houses, but the remaining twenty-six were tenement buildings, each building assured under eight squares in area, and containing three or four stories in height. The houses contained two tenements, one tenement on the ground floor having an entrance to the tenement, and a second direct access to the first floor, to which access is obtained by a separate entrance door and a staircase. The entrance doors to the two tenements were side by side, and were within a common porch, recessed about 3 ft. within the main front wall of the building, and within one arch. There were also separate entrance doors from each tenement to the rear, one by a doorway, and the other by an iron staircase. It was not possible to pass from one tenement to the other without passing out of one entrance door into the common porch and in at the other entrance door, or by passing through the yard in the rear. The fees on these buildings, amounting to 12s. 6d. each, were assessed on the basis of "a party and a half," it being claimed that they were within the proviso to the third schedule in the case of buildings divided into separate sets of chambers or tenements by party-structures, the fee is to be increased by one-half. For the defence it was contended that only a fee on the single sole was due.

Mr. Walter C. Williams, who appeared for the District Surveyor, urged that the buildings were within the proviso to the schedule, and agreed the definitions of a "party-structure," which means a party-wall, and also a party-floor or other structure separating, vertically or horizontally, buildings, stories, or rooms approached by distinct staircases or separate entrances from without." He claimed that the tenements had, in fact, "separate entrances from without," and the circumstance that the two entrances had a porch in common did not affect the issue, as each tenant could lock his own front door and so keep his entrance to himself.

Mr. G. S. Robertson, for the defence, urged that a separate entrance from without must mean from without the building as a whole, and that the existence of the recessed porch therefore precluded these tenements from coming within the proviso; there was no difference between a porch 3 ft. deep and a passage 50 ft. long, or a staircase 50 ft. high. There was only one staircase, not staircases, in each building.

Mr. Francis asked whether it was contended that these were not separate tenements.

Mr. Robertson replied that they have no separate entrance from without, but only a common entrance.

Mr. Francis: "You are inviting me to say it is not from without because it is from within the lobby?"

Mr. Francis remarked that it was always interesting to have an argument of this sort, especially when the learned counsel who raised the question was a highly technical one, but, in his opinion, the buildings came within the proviso, and the District Surveyor was therefore entitled to the extra half-fee, "separate entrances from without" meant a separate entrance from without each individual tenement, not necessarily from without the building. There would be judgment for 96s. 5s., and 2s. 6d. costs.

PAINTER'S APPEAL UNDER THE WORKMEN'S COMPENSATION ACT.

The case of Sharp v. Johnson & Co., Ltd., came before the Court of Appeal, consisting of the Master of the Rolls and Lords Justices Moulton and Cozens-Hardy, on the 5th inst., on the plaintiff's appeal from a decision of the Judge of the Greenwich County Court in an action under the Workmen's Compensation Act, 1897.

The facts were these:—The plaintiff, a painter, was employed by the defendants in the site of building some schools at Catford by the London County Council. The time for commencement of work was 5.30 a.m., and of the workmen engaged were supplied with tickets bearing numbers which had to be put into a pigeon-hole at the office near the entrance to the premises. The plaintiff came from London to Catford by a train which

arrived at about 5.50 a.m., and this enabled him to reach the works at about 6.10 a.m. He usually left his ticket at the pigeon-hole and then went to a mess-cabin, erected on the premises, and waited there until the whistle was blowing at 6.30 for work to commence. It was necessary for the workmen to deposit their tickets within three minutes after 6.30. On August 30, 1904, arriving at the works about 6.10 a.m., the plaintiff was proceeding to leave his ticket at the office, and then for the first time saw a hole in the ground about 5 ft. deep between him and the office, the hole having been made for a stop-cock. The night-watchman, seeing the plaintiff stumbling in stepping across the hole, offered to take the ticket and deposit it for him. While handing over the ticket a plank on which the plaintiff was standing slipped from under him, and he fell into the hole and was injured. The County Court judge held that the accident to the plaintiff did not, in the circumstances, arise out of or in the course of his employment, and that he was not entitled to compensation. Hence the present appeal.

At the conclusion of the arguments of counsel, the Master of the Rolls, in giving judgment, after stating the facts, said that the only point the Court had to consider was whether the plaintiff, getting to the premises twenty minutes before the time when work began, the accident did or did not arise out of or in the course of the man's employment. The County Court judge had found that the accident did not arise out of or in the course of the employment. When a judge had drawn a conclusion of fact, of which there was evidence, that Court was bound by his finding. He felt great difficulty in this case as to whether they were not bound by the conclusion of fact arrived at by the learned judge. He (the Master of the Rolls) should not have thought fit to differ from the learned judge if he had found that the accident did arise out of or in the course of the employment. But then came the question whether this Court was bound by the finding of fact of the learned judge? He thought that, when one really criticised what the learned judge had done, that Court was not bound by his finding, because it really rested on misdirection on a point of law, and if the misdirection was eliminated, it was clear that the accident arose out of or in the course of the man's employment. He was of opinion that the proposition of law involved in the County Court judge's finding was that they could not take the employment as commencing until the man actually commenced work on the job. He thought that did involve misdirection. The learned judge was wrong in trying the case by that standard, and this Court was bound to see what were the true facts. It seemed to him that the facts were all one way, and that the plaintiff had got, for the convenience of himself and his masters, to the place of employment at a time when, in ordinary circumstances, it would be unnecessary. Therefore, it seemed to him that, upon the undisputed facts, the accident did occur in the course of the man's employment. He thought, for the reasons he had given, that they might differ from the conclusion of fact of the learned judge. On these grounds he considered that the appeal should be allowed, and judgment entered for the plaintiff for the amount which had been agreed upon in the event of its being decided that the defendants were liable.

The Lords Justices concurred.

Mr. Ruegg, K.C., and Mr. Chester-Jones appeared for the appellant, and Mr. Walter Stewart for the respondents.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

7,758 of 1904.—A. H. BARKER: *Apparatus for Circulating Water in any System of Pipes, Specially Applicable to Heating Apparatus Where Hot Water is Required to be Circulated in a Closed System of Pipes.*

Apparatus for circulating water in any closed system of circulating pipes by means of the pressure of steam or compressed air, consisting of said system pipes, two closed tanks situated at or near the higher part of the system of circulating pipes, provided with a non-return valve, a separate or common outlet or outlet pipe from said closed tanks to said system of circulating pipes, provided with a non-return valve, a source of steam or compressed air and mechanism actuated by a float in one of said closed tanks, whereby the steam or compressed air continuously forces out the water from each tank alternately.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

7,803 of 1904.—S. TIMOCHOWITSCH: *Method of and Means for Ventilating Rooms, Halls, Railway Carriages, and the like.*

Means for ventilating rooms or the like, consisting in the combination of a chamber or space extending over the entire area of the upper part of the room or ceiling or part thereof, and on its underside, closed by means of perforate material or gauze, or other suitable distributing or filtering medium, air supply wires extending through the walls or ceiling of the structure, and connecting the chamber with the outer air, and air exhaust wires extending through the walls adjacent to the ceiling or through the ceiling, either set of wires or both set of wires being provided or not with driven fans or the like, and regulating valves as circumstances may require.

10,731 of 1904.—THE RICHMOND GAS STOVE AND METEER COMPANY, LTD., and W. H. SHERBURN: *Gas Fires.*

A gas fire, comprising a heat radiating back or base, and frets or grids on the surface of same, adapted to be heated by the gases of combustion, wherein the said frets or grids are detachably supported by projections on same fitting, and held in position in holes or apertures in the back or base, over the course or flow of the heating gases.

12,046 of 1904.—R. F. POCHIN and H. S. POCHIN: *Stone-breaking and Ore-crushing Machinery.*

Stone-breaking and ore-crushing machines with vibrating jaws, where the movement is actuated through inclined toggle plates, such plate being suspended by its fixed end to a boss hung upon a stationary horizontal shaft. Upon the shaft, at the place where the boss is hung, is fixed an eccentric, and by means of this eccentric, adjustment can be made and wear can be taken up; further, by this means, variation and alteration can be given and made in the angle or inclination of the toggle plate to give more or less movement to the jaw of the machine.

12,362 of 1904.—H. H. LAKE (Newland, Wellington, Laurie): *Means for Adjusting Windows, Fanlights, Skylights, and the Backs of Chairs, Sofas, and the like.*

Means for adjusting the back of a chair or other hinged article, comprising a bar hinged to the top of the chair or other article, the axial line of such hinge being different though parallel to that of the hinge of the back of the chair, a sliding block hinged to the other end of said bar and adapted to work in guides, and means for adjusting the position of said sliding block within said guides.

12,571 of 1904.—H. E. A. SQUIRE and H. A. SQUIRE: *Swing Joints or Movements for Mirrors, Windows, Ventilators, Book Rests, and other Swinging Articles.*

A swing joint or movement for mirrors, windows, ventilators, book rests, and other swinging articles, consisting in the combination of a plate adapted to be fixed to the side of the mirror or other swinging article, a cup or disc-like part adapted to turn on the face of the said plate, a pivot-pin securing the cup or disc-like part and plate together, and provided with a taper head adapted to engage with the stationary part of the movement, and a coiled wire or like spring contained and compressed between said cup or disc and the plate so as to set up the necessary friction to hold in position the swinging article which is fixed to the movement.

12,703 of 1904.—W. R. TAYLOR: *Mould for Forming Bricks, Briquettes, and the like by Hand Labour.*

This invention relates to moulds for forming bricks, briquettes, and the like, consisting in the combination of such a material for the composition of the mould as will reduce the weight to a minimum. Aluminium and many of its alloys possess the required combination of properties of lightness, rigidity, and durability to an extent which is much superior to that of other materials, accordingly the moulds are made of such a substance or substances alone, or encased in with material of organic origin which possesses, as compared with its weight, considerable rigidity, such as celluloid, ebonite, or wood. The mould may be formed, as a casting, plain or with strengthening and stiffening webs, or it may be built up of wrought metal, the parts of which are joined together by riveting, soldering, or welding.

15,099 of 1904.—F. ROYSTER: *Ventilator for the Top of Window Sashes.*

This consists of two pieces of wood or suitable material fixed together at about right angles to one another so as to form a J shape. The upper side is about one-half the width of the other or downward part. In the downward part holes of any shape are made. The upper part is fixed to the top of the window casing, so that the downward part is

close against the window sash. Then when the window is opened or pulled down to about the width of the downward part, air can pass through the holes before-mentioned. This L shape form fits between the two sides of the window framing.

14,603 of 1904.—G. A. PARENT: *System of Metal Girder for Structures of Cement, Concrete, or the like.*

A metal girder or beam for structures of cement, concrete, or the like, comprising in combination two longitudinal parallel bars and braces disposed in zig-zag between said bars, straps lapping over the corresponding bars and braces, split-pins or wedges which engage the orifices of the straps and ensure the fixation of the bars and braces, and thin plates of sheet metal each shaped to receive one of the diagonal braces and applied on each side of said braces at the points of intersection, and having projections integral therewith adapted to grip over the edges of each other.

21,944 of 1904.—H. HARPER & CO., LTD., and A. MORGAN: *Manufacture of Certain Kinds of Shelf Brackets and Cistern Brackets.*

A shelf bracket or cistern bracket formed of a curved channel section metal strut and a metal strip, which is bent at right angles to form the back and the top of the bracket, said top and back of the bracket having pierced and raised tongues or ears, which are closed down upon the sides and ends, or upon the ends only of the side flanges of the strut part, thereby securing the strut and the top and bottom parts of the bracket together.

28,729 of 1904.—E. B. WOOD: *Treating Wood for Preserving and like purposes.*

The process of treating wood, which consists in subjecting wood to the action of a heated bath of a relatively non-volatile substance having a higher boiling point than some of the natural constituents of wood, then subjecting the wood to the action of a solvent of the natural constituents thereof to be removed, then subjecting the wood to the action of the heated bath of a relatively non-volatile substance having a higher boiling point than the solvent to expel the solvent, and thereafter treating the wood with a preservative or other fluid.

SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

April 28.—By D. BAILEY & Co.	
Bethnal Green.—123 to 140 (even), Brady-st.	£1,560
2, 4, 6, and 8, Somerset-st., E., w. 72, 126, 20 to 30 (even), Neaill-pl., E., w. 85, 106.	600
By DYER, SON, & HILTON.	
Woolwich.—Church-st., E. 2, 4, reversion in 4 yrs.	250
By FORTESCUE & BRANSON.	
Hammersmith.—Pulham Palace-ct., two freehold building plots.	2,675
April 27.—By BATTAM & HEYWOOD.	
Wotton-Under-Edge, Gloucester.—"Lisle House" 1, 2 acre, E., D.	745
By HERBING, SON, & DAW.	
New Cross.—42 to 48 (even), and 48A, Pomeroyst-st., E. 28 yrs., E. 121, w. 149A, 108.	790
By C. MANDELL.	
Westbourne Park.—35, Kensal-rd. (S.), u.t. 64 yrs., E. 24, 108, w. 61A, 28.	310
By RUTTERS.	
Willesden Green.—1, Gowan Lea-parade (S.), u.t. 612 yrs., E. 11, 118, w. 283.	850
By WALTER PARISH (at Erith).	
Erith, Kent.—58, Berley-rd., u.t. 484 yrs., E. 101, p.	410
Belvedere, Kent.—Bedwell-rd., "Aldine House," 1, p.	500
April 28.—By W. B. HALLITT.	
Aldersgate.—9, Lauderdale-buildings (warehouse), u.t. 84 yrs., E. 260A, w. 450A.	1,700
By HARMAN BROS.	
Hatfield Broad Oak, Essex.—Encl. sure of pasture, 1 a. 2 r. 39 p. l.	100
Three enclosures of land, 30 a. 8 r. 9 p. l.	350
By R. TIDY & SON.	
Illegation.—5 and 7, Cleveland-rd., u.t. 47 yrs., E. 81, w. 92.	825
De Beauvoir Town.—60, Utton-rd., u.t. 15 yrs., E. 81, w. 41, 128.	205
St. Luke's.—87 and 88, Baltic-st., area 1,000 ft. l., w. 934, 128.	1,180
By F. VANLEY & SON.	
Pimbury Park.—38, Portland-rd., u.t. 53 yrs., E. 121, 128, w. 85.	645
Crouch End.—106, Weston-pk., u.t. 94 yrs., E. 71, 108, w. 38.	885
By J. M. WELCH.	
Hatfield Broad Oak.—"Sparrows Hall Farm," 77 a. 2 r. 21 p. l., w. 60A.	900

Contractions used in these lists.—E.g. for freehold ground-rent; l.g. for leasehold ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; q. for quarterly rental; w. for weekly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gds. for gardens; yd. for yard; gr. for grove; h.h. for beerhouse; p.h. for public-house; o. for office; a. for shops; ct. for court.

MEETINGS.

FRIDAY, MAY 5.
Junior Institution of Engineers (Westminster Palace Hotel).—(1) Mr. L. C. Lambert on "The Influence of Depth of Water on the Speed of Vessels," 7 p.m.; (2) Mr. James N. Boot on "Condensing Plant," 8 p.m.

SATURDAY, MAY 6.
Edinburgh Architectural Association.—Visit to Niddrie House.
Institute of Sanitary Engineers, Ltd.—Visit to Whit-street.

Northern Architectural Association.—Visit to Armstrong College, Newcastle-on-Tyne.
Incorporated British Society of Certified Carpenters.—Discussion on "The Metric System," to be opened by Mr. J. D. MacNair (pro.), Mr. G. Ayres (contra.), 6.15 p.m.

MONDAY, MAY 8.
Surveyors' Institution (Junior Meetings).—Mr. H. Lemmoin on "Public Health Act, 1875 (Sanitary Provisions). A Few Points for Amendment," 7 p.m.
Society of Arts (Senior Lectures).—Mr. Alan S. Cole, C.B., on "Some Aspects of Ancient and Modern Embroidery," 11. 8 p.m.
Bristol Society of Architects.—Excursion to Bath Stone Quarries.

THURSDAY, MAY 11.
Royal Institution.—Professor Sir J. Dewar on "Flame," 11. 5 p.m.
Society of Arts (Indian Section).—Mr. H. J. Tozer, M.A., on "The Manufactures of Greater Britain, III.—India," 4.30 p.m.

Society of Antiquaries.—8.30 p.m.
Institution of Electrical Engineers (Society of Arts, John-street, Adelphi, W.C.).—Mr. H. Laws Webb on "Telephone Traffic," 8 p.m.

FRIDAY, MAY 12.
Royal Institution.—Professor E. Fox Nichols on "The Pressure Due to Radiation," 8 p.m.

Royal Sanitary Institute.—The Institute Dinner, Prince's Restaurant, Piccadilly, 7 p.m.

SATURDAY, MAY 13.
Northern Architectural Association.—Student's Sketching Club Excursion.

Junior Institution of Engineers.—Visit to the Dorking Water, Gas, and Electricity Works. Train leaves Cannon-street at 1.30 p.m.
Incorporated Association of Municipal and County Engineers.—Midland District Meeting to be held at Market Harborough.

TO CORRESPONDENTS.

H. and G. (Too late. Next week).
NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

PRICES CURRENT OF MATERIALS.

* Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.	
Hard Stocks.	1 10 0 per 1000 alongside, in river.
Bough Stocks and Grizzles	1 6 0
Facing Stocks	2 2 0
Shippers	2 2 0
Flattons	1 7 0
Red Wire Cuts	1 14 0 at railway depôt.
Best Fareham Bed	3 12 0
Best Red Pressed	5 0 0
Rusdon Flueing	4 2 6
Best Blue Pressed	4 2 6
Staffordshire	4 2 6
Do, Bullnose	4 2 6
Best Stourbridge	4 0 0
Fire Bricks	4 0 0
GLAZED BRICKS.	
Best White and Ivory Glazed	12 0 0
Stretchers	11 0 0
Quoins, Bullnose, and Flat	16 0 0
Double Stretchers	19 0 0
Double Headers	16 0 0
One Side and two Ends	19 0 0
Two Sides and one End	20 0 0
Splays, Chamfered, Squints	30 0 0
Best Dipped Salt Glazed Stretchers, and Header	12 0 0

BRICKS, &c. (continued).	
Quoins, Bullnose, &c., d.	14 0 0 per 1000 at railway depôt.
Double Stretchers	15 0 0
Double Headers	14 0 0
One Side and two Ends	15 0 0
Two Sides and one End	15 0 0
Splays, Chamfered, Squints	14 0 0
Second Quality White and Dipped Salt Glazed	2 0 0 less than best.
Thames and Pit Sand	7 0 per yard, delivered.
Thames Ballast	5 9
Best Portland Cement	27 0 per ton.
Best Ground Blue Lias Lime	20 0
NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.	
Grey Stone Lime	12s. 6d. per yard, delivered.
Stourbridge Fireclay in sacks	27s. 6d. per ton at rly. depôt.

STONE.	
Bath Stone—delivered on road wag.	a. d.
Yons, Paddington Depôt.	1 4 0 per ft. cube.
Do, do, delivered on road wag.	1 4 0
Nine Elms Depôt	1 4 0
Portland Stone (20 ft. average)—Brown Washed, delivered on road wag.	2 1 0
Elms depôt, or Pimlico Wharf.	2 1 0
White Based, delivered on road wag.	2 1 0
Elms depôt, or Pimlico Wharf.	2 1 0
a. d.	
Ancestor in blocks	1 11 per ft. cube, delivered.
Beer	1 6
Greenhill	2 4
Darley Dale in blocks	2 4
Red Corshill	2 5
Cloeburn Red Freestone	2 0
Bed Mansfield	4 4
Yons Stone—Bath Road Quality.	2 10
Scrapped random blocks	2 10
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 8 per ft. super.
6 in. rubbed two sides ditto, ditto	2 6
3 in. sawn two sides slabs (random sizes) 0 11½	
3 in. to 2½ in. sawn one side slabs (random sizes)	0 7½
1½ in. to 2½ in. ditto, ditto	0 6
Scrapped random blocks	2 0 per ft. cube.
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2 8 per ft. super.
6 in. rubbed two sides ditto	3 0
3 in. sawn two sides slabs and-faced random flags	0 6

Hoyton Wood (Hard Bed) in blocks	2 0 per ft. cube, delivered.
6 in. sawn both sides landings	2 7 per ft. super, delivered.
3 in. sawn both sides random slabs	1 0
2 in. do.	0 8½

SLATES.	
in. in.	£ s. d.
24 x 10 best blue Bangor	13 2 6 per 1000 of 1200 str. d.
20 x 12	13 17 6
20 x 10 first quality	13 0 0
20 x 12	12 15
16 x 8	7 5 0
20 x 10 best blue Portmadoc	12 12 6
16 x 8	6 12 6
20 x 10 best blue Porek un-fading green	15 17 6
20 x 12	13 7 6
18 x 10	13 5 0
20 x 10 permanent green	11 12 6
18 x 10	9 6
16 x 8	6 12 6

TILES.	
Best plain red roofing tiles	a. d.
Hip and Valley tiles	6 0 per 1000 strip, depôt.
Best Broseley tiles	50 0 per 1000.
Do, Ornamental tiles	68 6
Hip and Valley tiles	4 0 per 1000.
Best Rusdon red, brown, or beddles do. (beddles)	57 6 per 1000.
Do, Ornamental do	60 0
Hip tiles	4 0 per 1000.
Valley tiles	51 0
Best Red or Oxford Staffordshire do. (Peaks)	51 0 per 1000.
Do, Ornamental do	54 1 per 1000.
Hip tiles	58 8
Best "Rosemary" brand plain tiles	60 0 per 1000.
Best Ornamental tiles	60 0
Hip tiles	4 0 per 1000.
Valley tiles	58 8
Best "Hartshill" brand plain tiles, sand faced.	50 0 per 1000.
Do, pressed do.	47 6
Do, Ornamental do	60 0 per 1000.
Hip tiles	58 8
Valley tiles	58 8

METALS.		Per ton, in London.	
		£ s. d.	£ s. d.
Common Bars		7 0 0	7 10 0
Shropshire Crown Bars, good			
"best quality"		7 10 0	8 0 0
"marked Bars"		9 10 0	—
"Steel Bars"		8 5 0	8 15 0
"Galvanized"		16 10 0	9 0 0
"Add upwards, according to size and gauge."			
Iron, Black—			
"Common sizes to 20 g."		9 0 0	—
"24 g."		10 0 0	—
"28 g."		11 15 0	—
"Galvanized, and ordinary quality—			
"Add 6s.—6 ft. by 2 ft. to			

Extra Pale French Oil	1	1	0
French Yellowish Vermilion	1	1	0
White Copal Enamel	1	1	0
Extra Pale Paper	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	6
Black	0	16	0
Knottling	0	16	0
French and Brush Polish	0	10	0

TERMS OF SUBSCRIPTION.
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* Denotes accepted. † Denotes provisionally accepted.

ABERYSTWYTH.—For erecting a public library, for the Borough Council. Mr. W. G. Paton, architect, 84 and 86, Colmore-row, Birmingham:—
Edwards Bros., Trevechan, Aberyystwyth * .. £2,806

AMAN.—For the erection of three additional classrooms, new cloakrooms, etc., and carrying out alterations and repairs to the existing school. Architects, Messrs. J. H. & J. W. Humphreys, for the Education Committee, 10, St. James's Place, London, W. 1:—
Messrs. J. H. & J. W. Humphreys, 10, St. James's Place, London, W. 1 * .. £1,200

Hetton Colliery siding 1,410 lineal yds. of 5-in. cast-iron pipes for a new pumping main from East Hetton Colliery to Quarrington Hill, for the Durham Rural District Council. Mr. G. Gregson, Surveyor to the Council.	
M. C. Hawxwell £310 0 0	Birtley Iron Co. £208 5 6
J. Laidler & Sons 254 0 0	J. & R. Ritchie, Lid., Middles- brough 193 17 6
Watson, Gow, & Co. 217 6 0	

EAST DEREHAM (Norfolk).—For alterations and
additions to Freemasons' Hall, for the "Sons" Lodge
of Freemasons. Mr. W. D. Hubbard, architect and
surveyor, East Dereham:—

W. Emma £127 6 6	H. Mack £113 0 0
-----------------------	-----------------------

E. A. Cradock & Son	£1,770 9 0	H. A. & J. A. ...	2,805 2 0
E. Beauland	1,694 18 6	W. Attkinson ...	961 0 0
J. Pkothall & Son	.....	W. Lant 910 2 0	
Son	1,393 4 9	T. Bell 999 9 0	
I. Stephenson	1,012 17 7	C. Firth, Scarborough ...	877 10 5
J. H. Wood	984 6 0		

GRAVESEND.—For erecting a Wesleyan church and schools, for the Trustees of same. Messrs. W. J. Morley & Son, architects, Craven House, Kingsway, W.C.—

Gann & Co.	£5,757 0 0	Lawrence & Son	£5,562 19 0
T. Pearce	5,850 6 0	L. Sagar	5,541 19 0
F. Miskin .....	.....	Gravesend	5,325 16 2
Ld.	5,849 8 9		
A. S. Lloyd	5,678 18 6		
W. A. Lloyd	5,639 0 0		

This image shows a blank, aged, cream-colored page, likely an endpaper or flyleaf of a book. The paper has a slightly textured appearance with some minor creases and discoloration, characteristic of old paper. The left edge of the page is bound, and the overall tone is a warm, off-white or light beige.

20 g.	12	10	0	...	—	Abas to Eshen Tinsakh Council. Messrs. J. L. Smith	£ 1,500
22 g. and 24 g.	13	0	0	...	—	Aberdare Urban District Council. Messrs. J. L. Smith	£ 1,500
20 g.	14	0	0	...	—	& Davies, architects, 7, Victoria-square, Aberdare:—	£ 1,520
	14	0	0	...	—	J. Jones, Gwawr Cottage, Aberdare* ..	£ 1,520

[And others varying from £6,892 to £8,200.]

TENDERS.—Continued on page 505.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered.
*Designs for New Schools, North Reddish	Stockport Education Committee	Not stated	No date.
*Extension of Shire House, Norwich	Norfolk C.C.	1000, 500, and 250.	do.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered.
Premises at Waunllwyd	Ebbw Vale Co-operative Soc., Ltd.	R. Worcester, Architect, 1, Balloon-street, Manchester.	May 4
Pitch and Creosote Oil	Manchester Paving, etc., Committee	F. Bergin, Engineer, 38, Westmoreland-street, Dublin.	do.
Sewering, etc., Works, Openshaw	do.	J. G. & R. G. Cowe, Architects, Chester-le-Street	do.
Sewering, etc., Works, C-on-M.	do.	E. Birks, District Surveyor, Town Hall, Uxbridge	do.
Drainage, etc., Moston	do.	Manse of Dyke, near Elgin, N.B.	do.
Drainage, etc., Harpurhey	Williams, Jowett, & Co.	C. G. Mason, C.E., Tuns Gate, Guildford	do.
Box Works, Cornwall-place, Marnham	Mountmellick R.D.C.	W. Brown, Surveyor, Kildare	do.
Maryborough Waterworks Extension	Mr. H. Yeoman	P. V. Jones, Architect, Hengod	do.
Alterations, etc., to House at Brompton, Northallerton	Staines U.D.C. and Egham R.D.C.	Council's Engineer, Council Offices, Hendon, N.W.	do.
Timber Footbridge near Staines Bridge	Sheffield Guardians	J. C. Brameld, Architect, 8 and 10, George-street, Sheffield	May 4
Furniture at Administrative Block, Fir Vale, Wilkes	Salford Tramways Committee	J. C. Brameld, Architect, 8 and 10, George-street, Sheffield	do.
Boundary Wall, Central Car Depot, Pendleton	Trustees	Borough Engineer's Office	do.
Painting, etc., Zion Free Methodist Ch., Kingswood	U.D.C.	H. F. J. Barnes, Secretary, Poole	do.
Three Houses in Hough-lane, Bramley	do.	F. Hopkinson, Surveyor, 40, Bridge-street, Woking	do.
Alterations to Alexandra Hall, Great Crosby	Stockton R.D.C.	C. Cleary & Son, Architects, 104, King-street, Manchester	May 10
Painting, etc., District Working Men's Club, Burradon	do.	T. M. Franklin, Glamorgan C.C. Offices, Cardiff	do.
Whinstone and Slag	Welsh Baptists	W. E. Putnam, Borough Engineer & Surveyor, Town Hall, Morley	do.
Loading Stone, etc.	Handsworth U.D.C.	J. Drake & Son, Architects, Queensbury	do.
Chapel, Congwreath, Glyn-Neath	Uxbridge R.D.C.	Gas Engineer, Portwood, Stockport	do.
Painting Victoria Park, Handsworth	do.	J. C. Valentine, Northgate Offices, Darlington	do.
Workmen's Club, Waldrige Fell	Guildford Town Council	Director of Navy Contracts, Contract Dept., Admiralty, & W. County Surveyor, County Courthouse, Belfast	do.
Repairs of Parish Church of Dyke	Wigton R.D.C.	C. W. Young, Secretary, Nicholas-lane, London, E.C.	May 11
Sludge Pressing Machinery at Sewage Disposal Works	Hendon U.D.C.	T. Longdin, Borough Surveyor, Warrington	do.
Outfall Sewer, etc., Buncrana, Ireland	Trustees of Methodist N. Connexion	H. F. Proctor, City Electrical Engineer, Temple Back, Bristol	do.
*Road-making Works	Aberdare U.D.C.	A. M. Cobban, Engineer, Home-street, Southport	do.
Chapel, Sharrow-lane, Sheffield	Directors, Poole Waterworks Co.	W. Harris, Architect and Surveyor, Gilfach, Pengam	do.
Schools, Aberdare	Blyth and Cuckney R.D.C.	H. C. Marks, City Engineer, 38, Fisher-street, Carlisle	do.
Private Street Works, Howard-road, Southampton	Glamorgan C.C.	G. E. Beaumont, Sanitary Surveyor, Greenlands, near Sheffield	do.
1,700 yds. of 6-in. and 700 yds. of 10-in. Pipes, etc.	do.	A. M. Manby, Clerk, 100, Darlington-street, Wolverhampton	May 18
6-in. Sanitary Pipe Sewer, Harworth-place, Bawtry	Morley Corporation	R. Lund, Architect and Surveyor, 3, St. Paul's-square, Bedford	do.
Alterations at Penybank Isolation Hospital, Eochriw	Buttershaw Industrial Society, Ltd.	H. W. Longdin, Surveyor, Town Hall, Anarley, S.E.	do.
Drainage Work, Annexe of Withington Wkhs.	Stockport Gas, etc., Committee	S. J. Eanlon, Clerk, Deva-chambers, Newmarket	do.
Rooms at Port Talbot Central School	North-Eastern Railway Co.	J. Hendery, Surveyor, 34, St. Andrew's-square, Edinburgh	May 3
Tar-paving, etc., Port Talbot Central School	Admiralty	H. J. C. Shepard, Town Hall, Tredegar	do.
Free Library, Commercial-street, Morley	Larne R.D.C.	J. Wadsworth, Surveyor, Rippenden	do.
Cart Shed and Stabling for Five Homes, Buttershaw	do.	E. A. Johnson, F.R.I.B.A., Abergavenny	do.
Painting Stockton Station	East India Railway Co.	Gustard & Waddington, Tredegar-chambers, Bridge-st., Newport	do.
Steel Nails	Warrington Town Hall, etc., Com.	G. R. Rislof, Engineer, Paisley Gasworks	do.
Bridge, Woodburn	Bristol Electrical Committee	F. V. L. Mathias, Boro' Electrical Engineer, Howley, Warrington	do.
Cutting a Hill	Scunthorpe U.D.C.	H. F. J. Barnes, Towngate-street, Poole	do.
Steel Boiler Plates	English Calvinistic Methodist	W. Stubbs, Borough Engineer, Municipal Offices, Blackburn	do.
Pavilion, Victoria Park	Carlisle Corporation	Lewis & Morgan, Architects, Dunraven-street, Tonypandy	May 18
Alterations and Painting at the Baths Hotel	Wortley R.D.C.	T. Biagburn, Surv., Council Offices, Ashley-road, Hale, Cheshire	do.
Motor Generator Rms., Temple Back Electricity Wks.	U.D.C.	P. R. A. Willoughby, Surveyor, Pontypridd	do.
Market Buildings	Pease U.D.C.	Leeds Corporation	do.
Chapel and Lecture Hall, Gilfach, Pengam	do.	do.	do.
Painting, etc., at Police Office and Cottage	Newmarket U.D.C.	T. A. Buttery & S. B. Birds, Architects, Queen-street, Morley	do.
880 yds. of Main Sewer, Chapelown-road, Ecclesfield	Tredegar U.D.C.	T. Houson, Architect, Kingscourt, Wellington-place, Belfast	do.
Sewer, Sandy-lane, Tettenhall, Staffs.	Loyland U.D.C.	F. T. Johnson, Surveyor, 2, Orsett-road, Gray's	do.
Sewering, etc., St. Cuthbert's Bldg., Eskate, Bedford	Rev. T. Richards	H. J. Weaver, Borough Engineer, King's Lynn	do.
Underground Conduits, Beckenham-road	Paisley Gas Corporation	M. H. Stille, Borough Engineer, Malson Dieu	May 18
Norwegian Kerb and Block Channelling	Warrington Electricity Committee	W. Banks, Surveyor to Council, Heslone Moor	do.
Road Metalling	Poole Harbour Commissioners	C. C. Dolg, Architect, Elgin, N.B.	do.
Recon. Dwlg.-hse., Stevenson Mains, nr. Eddington	Blackburn Town Hall, etc., Com.	H. W. Notman, 55, Gracechurch-street, E.C.	do.
Limestone	Hale U.D.C.	E. Call, Destructor Works, Hamerton-street, Bradford	do.
400 yds. of Kerbing, Rippenden Wood	Pontypridd U.D.C.	W. B. Madin, Engineer and Surveyor, Vestry Hall, Rushden	do.
650 yds. of 3-in. Flags, Rochdale-road	Leeds Corporation	Office of the Crown Agents, Whitehall-gardens, London, S.W.	do.
Church at Brighthelm	do.	The Engineer, Guildhall, E.C.	do.
Roads and Drains at Argos, Monmouth	do.	Council's Engineer, Dyne-road, Kilburn, N.W.	do.
Electric Power Generators	do.	do.	do.
Electric Conveyors	Warrington Electricity Committee	do.	do.
Condensing Plant at Electric Light Station	Poole Harbour Commissioners	do.	do.
Piling & Removal of Plat., Ballast Quay, Hamworthy	Blackburn Town Hall, etc., Com.	do.	do.
Lancashire Boiler at Baths, Belper-street	Hale U.D.C.	do.	do.
Alterations, etc., 77, Tyalscyn-road, Penygraig	Pontypridd U.D.C.	do.	do.
Making-up Coal-road, Hale	Leeds Corporation	do.	do.
Alterations, etc., Coedpenmaen School	do.	do.	do.
Painting, Woodhouse Moor and Ridge	do.	do.	do.
Painting, Potternnewton Pk. & North-st. Leazes, Ground	do.	do.	do.
Painting, Burley Park and Kirtland Abbey	do.	do.	do.
Primitive Methodist Church, Churwell	do.	do.	do.
Iron and Steel during 1905	do.	do.	do.
Two Villas, Villa-road, Donaghadee	do.	do.	do.
Road Material	do.	do.	do.
Road Materials	do.	do.	do.
Villa, Seafeld-street, Elgin	do.	do.	do.
Cleansing Main Sewer	do.	do.	do.
Ladies' Lavatory, Granville Gardens, Dover	do.	do.	do.
Tar Macadam Carriageway, Peel Mount-road	do.	do.	do.
*Alterations and Additions to Schools, Knappall	do.	do.	do.
Mal-barns and Kilns, Killoona Distillery, Coleraine	do.	do.	do.
Steel Bridges	do.	do.	do.
Scavenging	do.	do.	do.
*Stores	do.	do.	do.
Road Materials	do.	do.	do.
125,000 Hardwood Sleepers	do.	do.	do.
*Disposal of Refuse, etc.	do.	do.	do.
*Asphalte, Wood and Stone Paving Works	do.	do.	do.
*Road-making and Paving Works	do.	do.	do.

RUGBY.—For constructing sewers and outfall works at Bilston, for the Rural District Council. Mr. T. W. Willard, Surveyor to Council, Rugby.—
W. T. Denyer, Brinklow, Coventry* £249

ST. BEES.—For new chapel, laboratories, lecture hall, and library, St. Bees School, for the Governors. Mr. J. F. Curwen, F.S.A., architect, Kendal:—

	Labora- tories, etc.		Chapel.		Total.
	£	s. d.	£	s. d.	£
Anderson	5,724	0	0	0	5,724
Bradley	6,207	0	0	0	6,207
Bray	4,599	13	2,270	7	7,370
Clark & Robinson	6,500	0	0	0	6,500
Ferguson	4,889	14	7,548	3	12,437
Gradwell	5,475	0	0	0	5,475
Grisenthwaite	6,010	18	10,051	13	16,061
Hatch	5,395	0	0	0	5,395
Lalng	5,616	2	10,235	12	15,851
Lister	5,162	0	0	0	5,162
Moorhouse	6,223	14	0	0	6,223
Pennington, Ken- dal	5,593	10	0	0	5,593
J. Smith	5,821	6	7,290	10	13,111
H. Tinnion	6,083	2	0	0	6,083
J. I. Wilson	4,402	18	1,577	5	5,979
J. Young	5,409	19	6,255	7	11,664

SCARBOROUGH.—For additions and alterations to

Scalgrave School, for the Scarborough Education Committee. Mr. Charles Edeson, architect and surveyor, 25, Huntriss-row, Scarborough:—

Bricklayers: J. Bastiman & Sons, 70, Vic- toria-road, Scarborough	2524	0	0
Joiners: G. Lancaster, 25, Ralsight-street, Scarborough	246	0	0
Smith and Founders: H. Pickup, Brook- street Iron Works, Scarborough	102	14	8
Plumbers: W. M. Bolder, 40, Franklin-street, Scarborough	63	7	0
Slaters: J. Hardgraves, 27, Aberdeen-walk, Scarborough	90	8	0
Painters: A. Briggs, 63, Aberdeen-walk, Scarborough	17	13	8

[All subject to the approval of the Board of Education.]

SETTLE.—For water supply extension, Austwick, for the Rural District Council. Mr. T. A. Foxcroft, Surveyor, Town Hall, Settle:—

Excavating Trench for Laying and Jointing 1,740 lineal yds. of 3-in. Cast-Iron Water Mains, Fixing Valves, Hydrants, etc.			
Tattersall & Eatonshaw	£107	12	10
Brassington Bros. & Corney	104	12	4
Cannibland Bros.	104	2	4
Dudley & Fair- clough	£103	7	1
W. Stayton, Settle, Yorks*	100	8	3

SHEFFIELD.—For widening of Hillsbro' Bridge. Mr. C. F. Wike, City Engineer, Sheffield:—
Ash, Son, & Biggin, Sheffield* £2,880

SWAFFHAM.—For additional nurses' quarters at workhouse, for the Guardians. Mr. L. E. Eagleton, architect, King-street, King's Lynn:—

Bell & Son	£225	0	0
J. E. Impson	297	15	0
B. Dye	297	0	0
A. Collison	297	0	0
Banyard & Son	295	0	0
H. Hipwell	294	12	0

[Accepted with addition of 8s. for wood-block floor.]

TAUNTON.—For infirmary and detached buildings for servants' quarters at Taunton School, for the

G. Pollard & Co., Ltd.	£295	0	0
F. Small	949	0	0
A. J. Spiller	918	0	0
W. Potter	899	0	0
F. H. Mogridge	887	15	0

E. G. Coles	£227	13	10
G. Pollard & Co., Ltd.	817	13	5
F. Small	722	0	0
A. J. Spiller	697	0	0
W. Potter	680	0	0

TREWESBURY.—For erecting an elementary school, for the Education Committee. Gloucestershire County Council. Mr. M. H. Medland, County Architect, 15, Clarence-street, Gloucester. Quantities by Messrs. Vale & Kingsford, George-street, Gloucester:—
Batcourt &
Sons £3,799 | 0 | 0 || T. J. Williams | 3,710 | 0 | 0 |
W. F. Drew	3,585	5	0
E. W. Wilks	3,439	0	0
Draper & Wal- lington	3,295	10	0

TREDEGAR JUNCTION.—For the erection of twenty-nine houses at Pontllanfraith and Tredegar Junction. Mon., for the Tredegar Junction No. 3 Building Club. Mr. W. A. Griffiths, architect, Pontllanfraith, Mon.:—
H. Phillips £6,273 | 10 | 0 || Passmore & Perkins | 5,720 | 0 | 0 |
| Evans & Walters | 5,669 | 0 | 0 |
| W. & D. Thomas | 5,350 | 10 | 0 |

WIMBLEDON.—For the supply of 18-in. and 24-in. cast-iron pipes, for the Urban District Council. Mr. C. H. Cooper, Engineer and Surveyor, Council Offices, Broadway, Wimbledon:—

D. Stewart & Co. £269 15 11	D. F. Thomson	£216 16 0
E. Willaher	283 10 0	216 16 0
J. Oakes	253 13 8	215 8 3
Cochrane & Co.	235 8 6	214 8 0
J. Dickson	230 10 8	211 8 4
Cochrane & Co.	221 9 10	207 16 0
Sheepbridge Coal & Iron Co.	219 1 7	203 11 0
Clay Cross Coal Co.	218 13 8	

WOOD GREEN.—For alterations to Alexandra Schools, for the Wood Green Education Committee:—
Rudd & Son £1,430 0 0 J. Groves & Son | £1,194 7 9 || J. H. Pearce | 1,400 10 8 | 1,189 0 0 |
W. Barrett	1,391 8 0	1,177 0 0
H. W. Patrick	1,310 0 0	1,164 0 0
W. Flowerdew	1,287 0 0	1,163 0 0
J. Ferguson & Co.	1,285 0 0	1,157 0 0
B. E. Nightin- gale	1,285 0 0	1,133 0 0
L. P. Lam- plough	1,259 0 0	1,123 0 0
J. J. Holliday	1,250 0 0	1,114 0 0
Myatt & Upson General Build- ers, Ltd.	1,227 0 0	1,101 0 0
Aldridge & Son H. Kent	1,210 0 0	1,093 0 0

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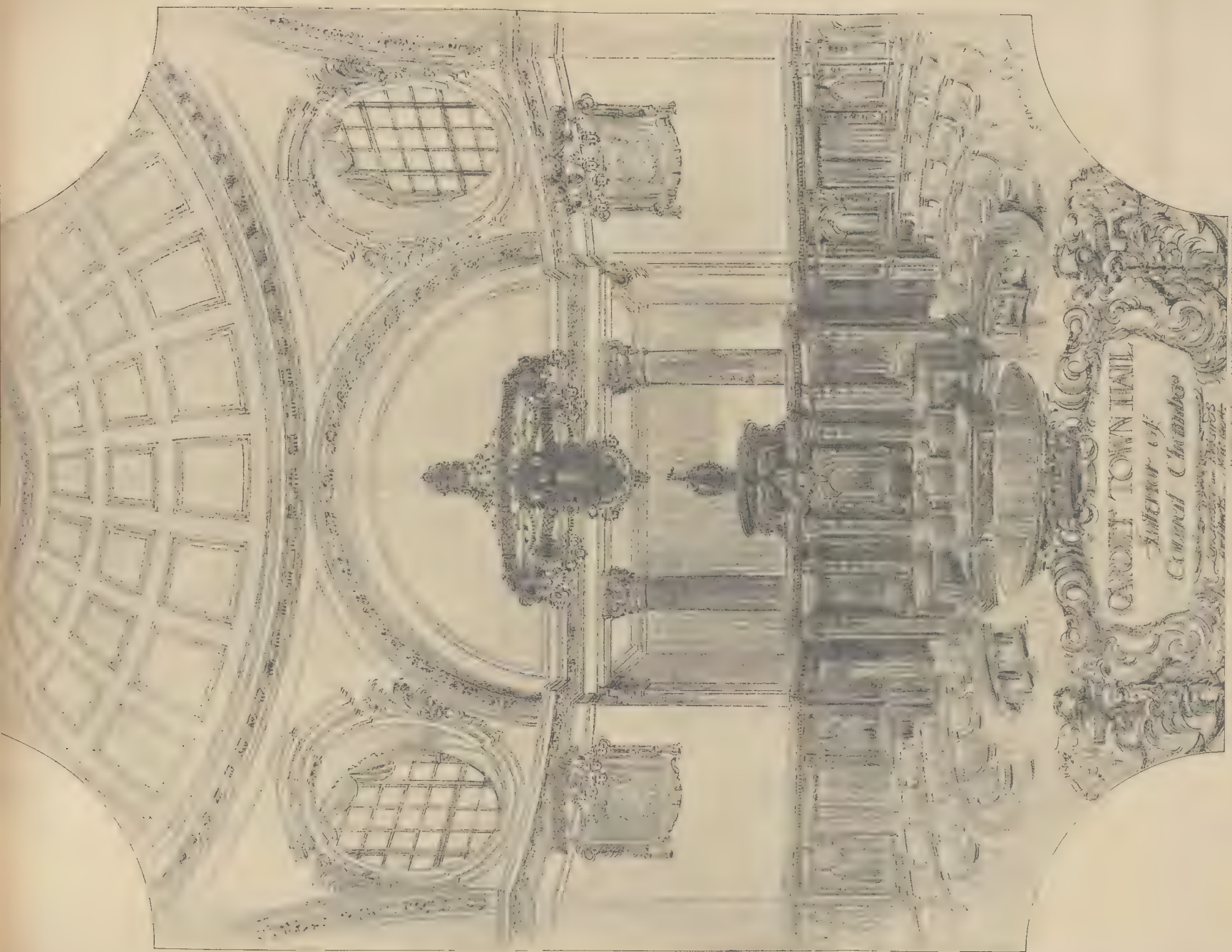
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CARDIFF TOWN HALL
Interior of
Council Chamber

Designed by J. H. P. Jones
and J. H. P. Jones
Cardiff

BARCLAY'S
BANK
CHELMSFORD
Arthur Blount
Architect

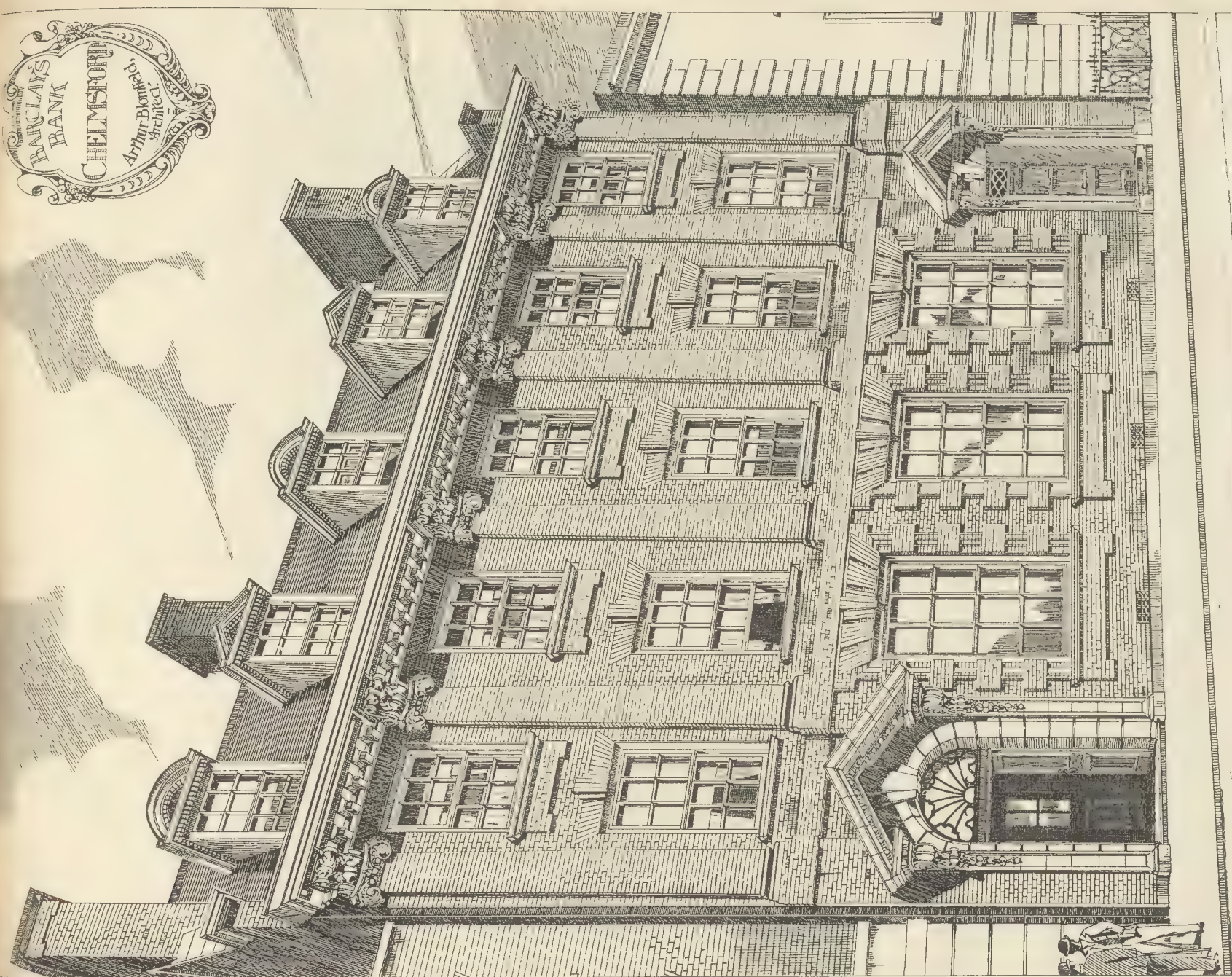
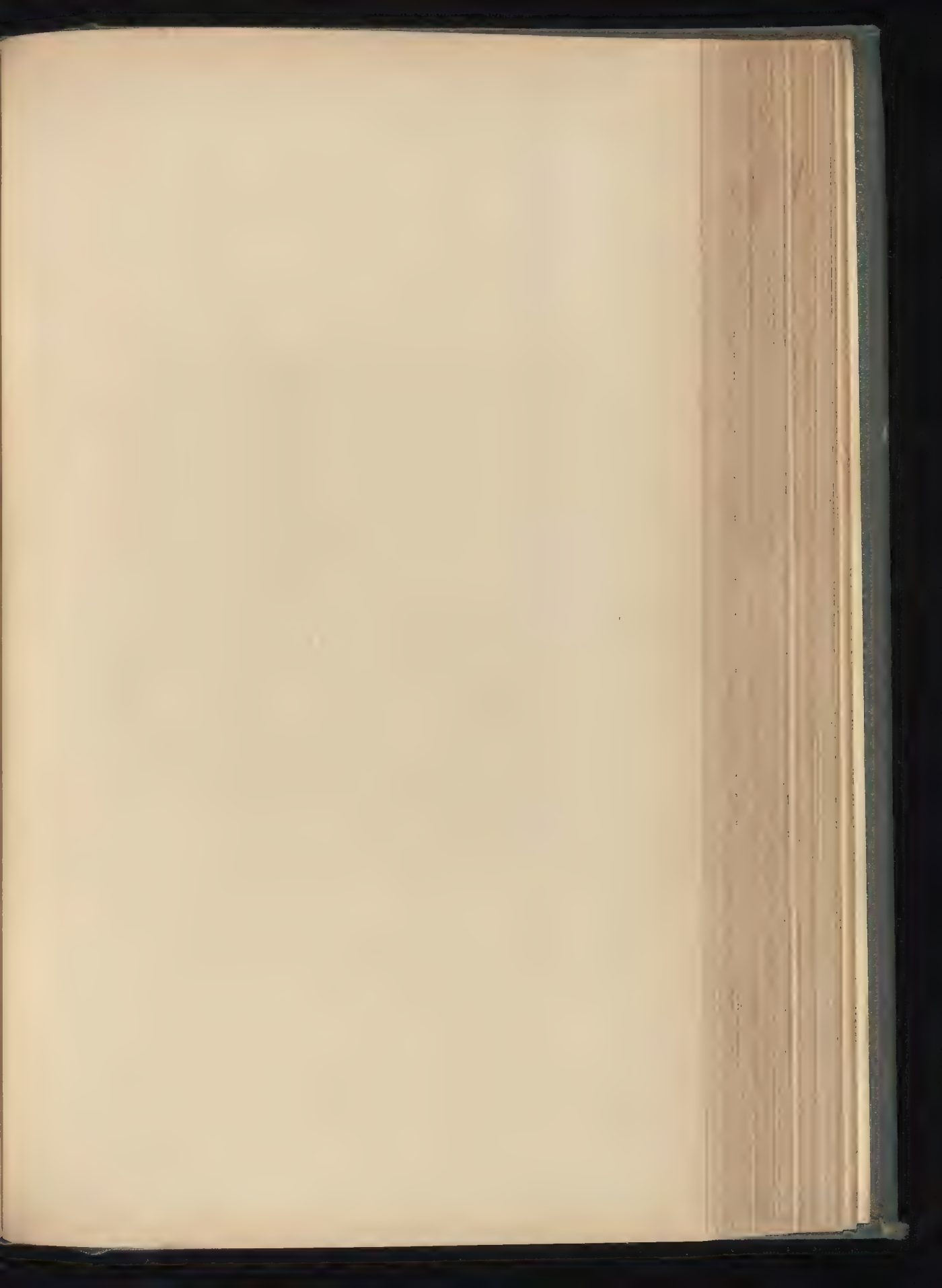
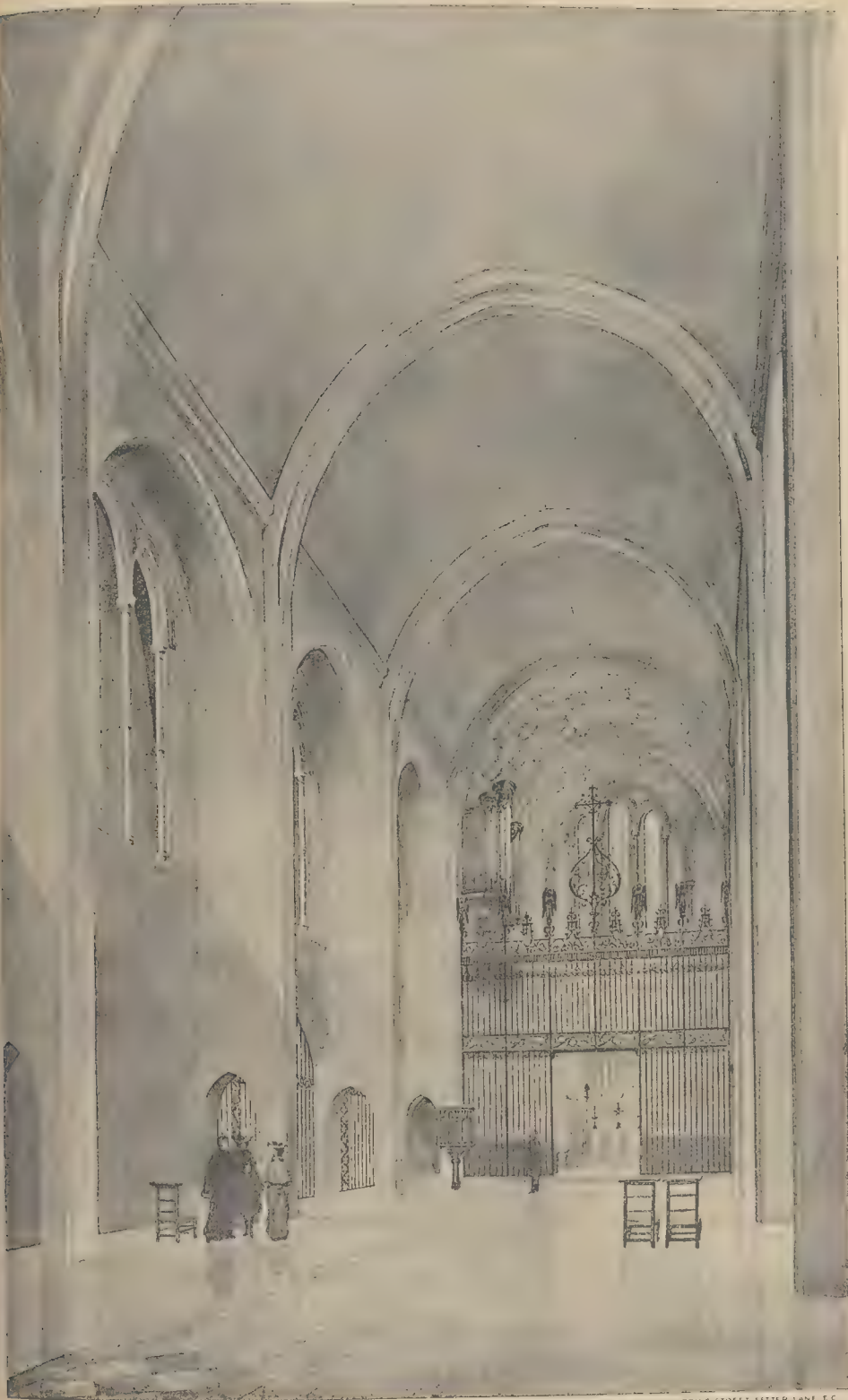


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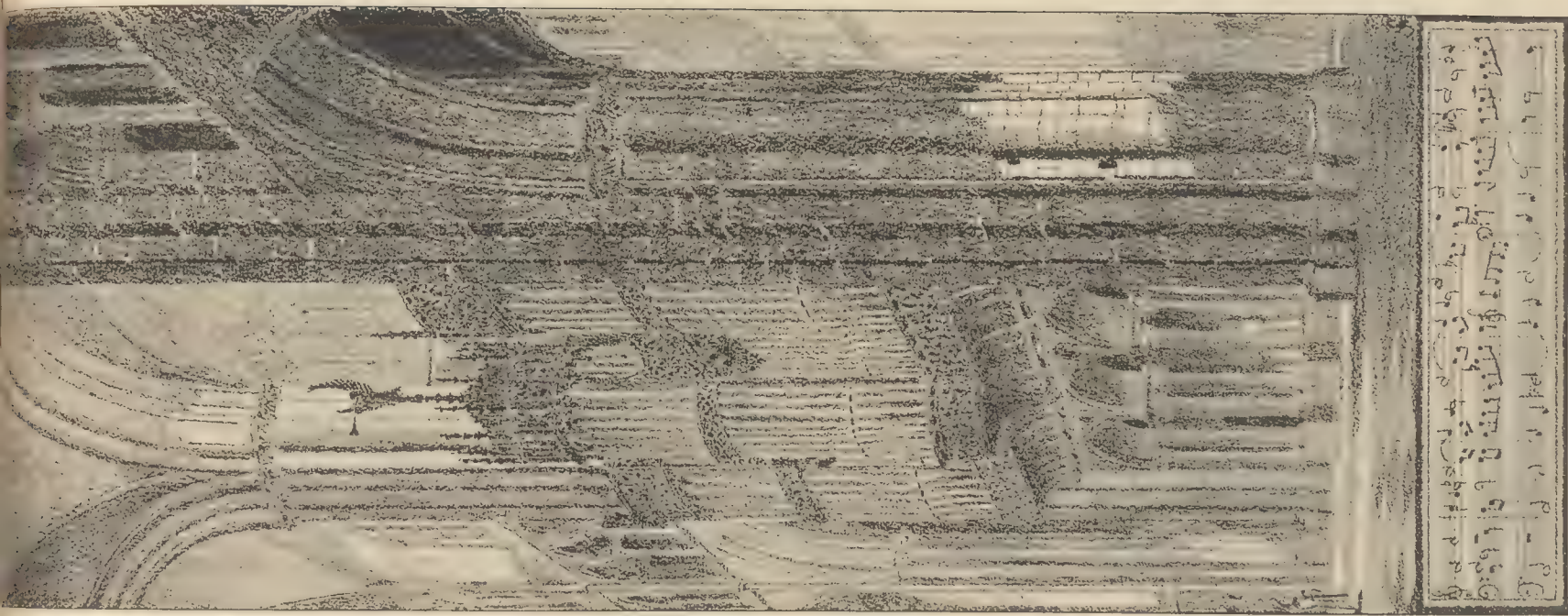


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THE OUT-VOLUNTARY.—FROM A CHARCOAL DRAWING BY THE EDITOR

The Builder.

VOL. LXXXVIII.—No. 3249.

MAY 15, 1905.

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Design for a House.....	By Mr. R. A. Briggs, F.R.I.B.A.
"Framework": the Entrance Front.....	Mr. Gerald C. Horsley, Architect.
House at Enfield.....	Messrs. Hart & Waterhouse, Architects.

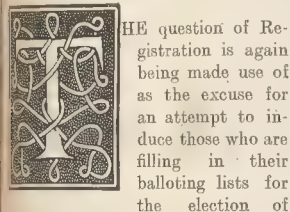
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The Institute Elections.



HE question of Registration is again being made use of as the excuse for an attempt to induce those who are filling in their balloting lists for the election of

Council and Officers of the Institute of Architects for the ensuing session, to use the opportunity for voting nearly all the men who would represent the highest class of architects on the Council, and filling up its ranks with inferior men to be voted for on the sole ground that they are pledged to support Registration.

It seems strange that the advocates of this move in the game should not even perceive that they are thereby formulating the most obvious and emphatic condemnation of their own cause. One of the cries that has been heard is that Registration is to raise and fortify the dignity of the profession, and here are the supporters of it showing their anxiety to raise the dignity of the profession by inviting all their adherents to combine in voting out the leading men of the day, and filling up the Council of the Institute by mediocrities whose claim to election is that they are all pledged to a particular policy, and that one to which the leading men of the profession, both within and without the Institute, are opposed. There could hardly have been a more cynical

confession of the weakness of their own cause.

We publish two replies this week to our "Note" on Mr. Middleton's letter of last week, both of them from good men, who express themselves in a moderate and dignified manner. But when Mr. Gibbs tells us that Mr. Middleton's argument, that Registration would raise the standard of professional education, is by no means new to him and that this object has been before the supporters of Registration for a long time, we naturally ask, how is it that we have heard so little of it before? What we have mostly heard is that the profession is being robbed by jerry architects. That has always been the prominent cry, and it seems to us that this idea of the improvement of education by means of Registration has been rather suddenly emphasised at the last moment. The letters that we have printed are, we admit, reasonable and sensible letters worth every consideration; but if our readers could have seen one or two of the letters we do not print, he would see that such letters form rather a significant indication as to one kind of architect to whom the Registration gospel appears specially to appeal.

Our conviction in regard to Registration—to sum it up again briefly, is—that it is not wanted; that the other countries in which architecture is at present in the most healthy condition and architects most honoured—viz., France, America, and Germany—have not thought necessary to adopt it; that, if architecture is both a

science and an art, yet neither engineers on the one side, nor sculptors and painters on the other side, have thought any such movement necessary to protect their interests; and that the immediate result of such a measure would unquestionably be to lower the status of the profession by confirming in the rank of architect the very kind of men whom the upholders of the movement profess the wish to muzzle. But what is perfectly certain is this, that no good can come to the architectural profession by a kind of campaigning the object of which is to prevent all the best men from being elected to the managing Council of the central professional body, and to fill it with inferior men. A movement which is to be carried on in that spirit is self-condemned on the face of it, and such tactics are, in the long run, useless in any case to those who employ them. If this question of Registration is to be settled one way or another, the wire-pullers, as we may call them, may rest assured that it will not be settled apart from the will and the support of the leading men of the profession. No good, therefore, can be done, from any point of view, by adopting the selfish and narrow policy advocated in this case by the Registrationists; and we hope that all those who have not yet filled up their balloting lists will recognise that the honour and dignity of the Institute Council are the first consideration, and will follow the suggestion in the last paragraph of Mr. Cole Adams's letter (page 517), and record their votes accordingly.

ARCHITECTURE AT THE PARIS SALON.



THE architectural gallery at the Old Salon is not as interesting as usual this year. The principal exhibit is, as usual, an "envoi de Rome," but in this case it is not, as usual, a restoration of a great Greek or Roman monument (like that of the Island, of the Tiber last year), but merely an "Étude sur l'habitation antique," consisting of the restoration of a Pompeian house, and an imaginary plan of a Roman villa of the time of the Cæsars. The fact is, no doubt, that the great classic monuments which are capable of affording studies for a grand restoration scheme are getting exhausted; hence the recent ordinance that students at the Villa Medici might, if they pleased, fall back upon Pompeii as comparatively new ground; and in this case the Pompeian Villa forms the principal element in the drawings. The author is M. Chiffot, a pupil of three very eminent French architects—M. Daumet, M. Guirault, and M. Esquié. He offers a complete set of drawings of what he entitles the "Maison de Centenaire" at Pompeii. The drawings of the existing remains consist of plans which are bordered by drawings of fragments of mosaic floor details, and sections which are accompanied by larger-scale details of portions of wall surface, with as much of their coloured decoration as can still be made out. In the elaborate restoration drawings the author appears to have turned to account all the known details of Pompeian decoration, and thrown them together into a single house. The result does not seem a very probable one, but it is not impossible, and at all events the drawings are finished regardless of labour. We observe that in the court of the atrium a wooden gallery is shown running round the court above the unlighted portion of the atrium. The set of drawings includes a number of sketches of remains of wall-paintings, bronze figures, etc., copied in water-colour with great care and precision. The wall-paintings, in their general resemblance of style and detail, give one more than ever the impression that these graceful additions were the work, not of eminent artists, but of the "decorating firms" of the day. The figures, though varying in action, are all of the same type, and when the trick was acquired, may be supposed to have been produced wholesale by the decorative artist, with little difficulty or study. The drawings, those of the bronze sculptures especially, are admirably executed, and the whole set highly creditable to their author, although, as already observed, they have not the interest of some of the splendid sets of restorations of Roman temples, etc., which we have seen in some previous Salons.

"Projets" which are only architectural dreams are even more numerous, and designs executed or commissioned even less numerous, than usual. M. Prévot is the author of two of the most noteworthy of the former class of designs. One of these is for a "Manufacture des Tapisseries des Gobelins," which may have a certain practical bearing, since the building of a new

Gobelins manufactory has really been discussed. The general design of the façade, with its coupled Ionic columns in the centre and pilasters on the wings, recalls that of the Palais des Beaux-Arts; and as in the case of the latter building, this grandiose classic architecture is a good deal spoiled in its effect by the great glass roof visibly surmounting it. M. Prévot's other scheme is for "Une Académie Américaine à Paris," also a scheme which has been discussed by the Americans, but which will doubtless be carried out, if at all, by an American architect, for the American love of everything French hardly extends to robbing their own architects of a commission in favour of a Frenchman. The treatment of the main central pavilion in this design is very fine and effective; a long continuous ground story with rusticated arches supports a main story divided up by four pedimented pavilions, connected by a plastered expanse of wall with rectangular windows. All these things sound a good deal alike in description, for the main architectural elements are always pretty much the same, but there are differences in the refinement of detail, and this one is one of the best façades in the gallery. The separate pavilions are rather ineffective in treatment, and moreover seem out of scale with the centre block. Then there is M. Ferrand's design for "Une Université Navale," standing boldly above a sea-coast with immense ranges of terraces and steps up to it; and M. Ebrard's design for a "Maison de Mutualité" (whatever that may mean) at Paris, which differs a little from the usual school type; instead of an order, the broad piers of the wall are treated as a kind of reminiscence of the order, finishing with a decoration which occupies the place that the capital would occupy in an ordinary pilaster; a kind of translation of classic detail into more modern constructional form. A more remarkable scheme is that of M. C. E. Lefèvre for "Une Université pour des Études Supérieures," which, though it is not likely to be carried out, might be, and would be a very fine institution. The idea is that of a great University group built at the outskirts of Paris, with a grand entrance court towards the city, and abutting on the other side on a great artificial park with radiating avenues like those of Hampton Court. The plan shows an arrangement of the buildings both effective and hygienic, and altogether this is a scheme well worth attention both for its practical and architectural qualities. This design serves also to emphasise the advantage of the large-scale plans which are required, by custom and common assent if not by rule, in the architectural gallery at the Salon, for here the chief merit and point of the whole scheme lies in the plan, which is of course shown on the same scale as the elevations. M. Bossard's "Centre d'Assistance Mutuelle" is a scheme on a more practicable scale, which may be an actual commission, though not so stated; but unhappily its architectural quality is of the poorest. Then there is M. Coutan's design for a Municipal Palace for a seaport, the chief merit of which lies in its size (if that is to be taken as a merit); and M. Fournier de

Saint-Maur's large coloured section of a "Galerie des Fêtes," which may be described as gewgaw in execution, a kind of more exuberant edition of the Salle des Fêtes of the Hôtel Continental, covered with swags and carved garlands hanging loose in the air, and painted nymphs kicking about in all directions. One must suppose that there are people in France who admire this kind of thing, or it would not be drawn and exhibited; but it is difficult to understand.

Among "projets" of a more practical type is one which M. Masson-Detourbet oddly calls "Projet d'agrandissement de la Porte-Maillet." As the Porte-Maillet (the main entry to the Bois de Boulogne, at the foot of the Avenue de la Grande Armée) at present consists of some gates and mean-looking keepers' lodges, to call this scheme with a great tower an "enlargement" seems rather absurd. The brick and stone clock-tower, rather spoiled by its over-large corbelled-out turrets at the angles, rises in the centre of the present line of gates, and expands at the base into a line of lower buildings right and left; at the further side of it, next the Bois, the ground is laid out in a large semi-circle with radiating drives connecting with the main avenues of the Bois; these at present radiate more or less from the Porte, but not on a regular geometrical plan. It would make a stately entrance to the Bois instead of the present mean one, and the clock-tower might be a practical convenience at this point; otherwise we should have said that a large arch of entry would have been more appropriate than a tower planted on the centre of the road way. Then M. Emile Lucas exhibits what is really to the point, a design for a wireless telegraphy station, a new kind of establishment which is waiting for its architectural treatment. He shows a massive masonry tower with very bold rustication at the base and a battered line of walling; the tower carries a great mast securely fixed on the top, and is connected by an open arched porch with a lower building which contains the offices in connexion with the station. The idea is generally meritorious, but a little spoiled by a want of simplicity in the treatment and details of the tower; French architects cannot get rid of that desire for a *curiosa felicitas* of detail, whereas the simpler and bolder such a thing is the better: it would probably be better done in England, if taken in hand by an English architect of the right sort, but we may thank M. Lucas for the suggestion. M. Corlette exhibits the exterior and interior perspective views of his design for Liverpool Cathedral, under the title, "Projet de Cathédrale Moderne," a title which he probably thought more keeping with the habitudes of the Salon architectural room; and Mr. C. A. Nicholson exhibits a "Projet d'un Mausolée Royal," an interior and exterior perspective of a Gothic chapel, which would have more effect but for the rather loaded and cluttered appearance of the water-colour drawing.

There appears to have been an important competition for a museum to the town of Orleans, several of the competing designs for which appear among the exhibits. As they all include a lofty tower in Gothic style, it is

semicircular angle turret, it is to be presumed that some such feature was demanded by the official programme. More than one of the designs is picturesque and effective, but they in general suggest the Hôtel de Ville rather than a museum. One of the best is that by M. Juste Lisch, who, while giving to his general design a rather mediæval character and outline, has treated it mostly with the detail of a classic type, and given it a feudal expression than most of the others. The design most suggesting a museum is that by M. Félix Ollivier, in which the style is very freely treated. The design to the courtyard, with an elliptical arcade, and a blank wall over decorated with inscription panels and medallions containing busts, is a very pleasing piece of design and suitable for the occasion. Some of the competitors seem to have forgotten that the interior of a museum requires a good deal of wall space, and have pierced their walls with windows everywhere. A recent competition, probably a Beaux-Arts Students' one, for a bell-tower (clocher), leaves its mark on the exhibition in the shape of a number of designs for very lofty and ambitious erections of this kind, more remarkable in general for effect than success; that by M. Leprieux-Ringuet (a pupil of M. Laloux) shows a tower rather powerful treatment of the masonry stalk, and a great bell hanging visibly at the top in the centre of a wrought-iron corona.

M. Lapeyrière exhibits a very interesting set of drawings showing the composition of the Place d'Aquitaine at Bordeaux, "avant et après l'exécution du Pasteur." The drawing of the "avant l'actuel" shows a great rusticated stone triumphal arch or gateway in very severe style, with a heavy pediment over it, standing in the middle of an open space, with streets seen in perspective behind it. The treatment proposed or carried out (it is not very obvious which) consists in connecting this arch by rusticated wing-walls on each side with a line of new stone buildings, so as to combine the whole into one architectural composition; the wing-walls having each a square-headed passage-way, the whole treated in a massive style in keeping with that of the existing arch. The whole is an interesting piece of work, shown in a very fine set of drawings. M. Louis Paul Riche exhibits the drawings of an interesting modern quasi-oriental building, "La Nouvelle Medersa d'Alger." What a "Medersa" exactly is we do not know, but the building is a large white pavilion in Moorish style with a central dome and small cupolas at the angles, the principal entrance effectively decorated with coloured tiles. The building stands on the side of a steep hill, so that the main entrance is really on one of the upper floors, and a great flight of wide steps at one side adds to the effect of the whole. In the greatest possible contrast to this is M. Charles Bérard's "Groupe Scolaire de Maisons-Alfort (Seine)," one of those severely practical school buildings which the French carry out so well, and a little less like a work-house than some of their Lycées. The administration consists of a three-storied central block, and

on each side is a range of low buildings with large mullioned windows which finish right under the eaves, the roof being carried by steel girders across the openings; these, it appears from the plan, are covered playgrounds, the class-rooms being placed in the return wings enclosing the open playgrounds. M. Gaudibert's "Caisse d'Épargne de Montbrison" is an ambitious but restless stone building with no coherence in the design. M. Hameau's "Services Municipaux à Saint Denis" shows a graceful classic façade in the centre block, with side blocks apparently containing offices, which are treated in a simple but very effective manner, with a series of semicircular windows on the ground floor and rectangular ones above, a heavy cornice crowning the wall. The plan is an irregular quadrangle enclosing a courtyard. As a design for an official building this is very good. M. Soufaché's "Une Habitation de Plaisance" appears to be only a design for an imaginary house, but it is one of the best things exhibited. It has a rectangular plan with the centre of the front recessed, and at the back is fitted in a large octagonal room half within the line of the plan, the other half forming a projecting bay. The treatment of the front is excellent; the projecting wings are solidly built, with angle quoins and a little very delicate low-relief carving about the window heads; between the wings an open colonnade is carried across, surmounted by a balcony with a graceful metal railing; the whole design shows the refinement of French house architecture at its best. Among actual houses is M. Arnaud's house in Rue Octave Feuillet, showing the usual style of pilastered front but with a door-way filled with dreadful *art-nouveau* iron-work, an offence which is repeated in the balconies. Perspectives of the interior rooms are shown, but they are in very rococo taste. A better specimen of the new Paris House is M. Voisvenel's house, No. 60 Avenue Victor-Hugo, in which the usual elements of a modern French street house are treated with refinement; and the same architect's house, No. 6 Rue Georges-Ville, on a corner site with a re-entering angle, with a compact plan very cleverly arranged on this awkward shaped site, and quite worth study. M. Knight's Seaside Villa for an English family is also a good house design, the plan a good specimen of typical French arrangement (the architect, in spite of his name, is French in residence and in professional education), and the design a very good example of picturesqueness without eccentricity. Another villa by the sea, M. Tronchet's "Villa Lumen," shows on the other hand eccentricity without picturesqueness, and is an extraordinary phenomenon to find on the top of a chalk cliff overlooking the sea.

M. Doillet's "Casernes des Sapeurs-pompiers" at Ménilmontant is an example of one of those business-like barrack buildings which the French carry out in excellent practical style and in very good taste, for there is no incongruous ornament; only one wonders at seeing such enormous sheets of elevation expending in drawing hardly anything but brick jointing and stone rustication: M. Beuvier's Library and Museum at

Brest, of which the plan is too high to be seen, is a very satisfactory example of a quietly and suitably treated classic building.

As to churches, there are various examples, nearly all in that heavy Neo-Romanesque manner which has become the accepted type of modern French church architecture, and which somehow seems to present one with the heaviness of Romanesque detail without its structural significance. But there is one really fine church, Notre Dame de Sion at Vienna, by M. Lamorey. This appears to be an actual design by the architect named. The perspective view of the interior shows a design founded on Byzantine architecture, roofed by a series of domes carried on transverse arches, with round arches at the side the whole height of the interior, but cut by a gallery with a simple but well-designed balustrade, the gallery being supported beneath by marble columns with carved quasi-Byzantine caps. If this is really a modern church in Vienna built by a French architect (the catalogue information is so vague that one can never be sure), it is an unusual piece of work and highly creditable to its author.

Among the illustrative drawings is a splendid set of coloured views and geometrical drawings of the interior of the Palatine chapel at Palermo by M. Jean Hulot, now a student at the Villa Medici, and who also sends a fine set of water-colour elevations of antique fragments, forming obviously a part of his student's work there. To judge from his drawings M. Hulot is a student we shall hear of again. There are many interesting sketches and illustrations of ancient or foreign architecture, such illustrative work always forming a large proportion of the Salon exhibits; but with the exception of M. Hulot's splendid drawings just referred to there are none which claim special notice.

It is surprising how small a proportion of the contents of this long gallery is occupied by illustrations of the actual architecture of the day. Five-sixths of the drawings, at least, are either *projets* or illustrations of old work. It is a pity that the French architects, and the Committee of the Salon, do not endeavour to rise a little more to an endeavour after an adequate illustration of the actual architectural work of the year: it would be of more interest than all these imaginary palaces.

PROPOSED REBUILDING OF THE "AULD BRIG," AYR.—A meeting of the Works Committee of Ayr Town Council was held on the 3rd inst., chiefly to consider the question of the rebuilding of Ayr old bridge, for which over 10,000*l.* is available. Mr. John Young, Town Surveyor; Mr. John Eaglesham, C.E., Ayr, ex-surveyor; and Mr. James A. Morris, architect, F.S.A. Scot., submitted reports respecting the proposed restoration.

ORGAN ENLARGEMENT, BRISTOL.—The organ in the Coleton Hall, Bristol, has recently been extended and improved. The main features of the design consist of four towers formed of thirty-two open diapason pipes, connected at the sides by semi-circular bays of smaller pipes, and in the centre by flats of similar pipes fitting in with the woodwork of the case. The placing and composition of the pipes and the design of the organ front are in accordance with the suggestions of the architects of the hall, Messrs. Hall-Jones & Cummings, Messrs. Norman & Beard, Ltd., of Norwich and London, carried out the work.

NOTES.

The Trades Union Bill. The Trades Union Bill is at an end for the present session. Owing to an amendment in regard to picketing, which was carried against the Labour Members of the Committee on Monday, its supporters have given up the Bill, though it is finally reported to the House of Commons itself. The wording of the amendment in question was no doubt vague and open to misconstruction, but its object was right—namely, to prevent a person being obstructed, insulted, or annoyed by a person engaged in picketing. It is all very well to say that "annoyance" is a vague word, but it is a bad policy for the Labour Members to allow the idea to get abroad that they object to the limitation of picketing so as to make it a peaceable measure. No doubt the force of this manoeuvre lies in its changeable character, and we cannot believe that the House of Commons will ever pass a Bill in a shape in which it can interfere with individual liberty and freedom.

The Public Authorities Protection Act. WE have frequently had occasion to draw the attention of our readers to the provisions of the Public Authorities Protection Act, under which an action will not lie against a public authority unless it is commenced within six months "next after the act, neglect, or default complained of, or in the case of the continuance of injury or damage within six months next after the ceasing thereof." In the latest case on this subject, *Williams v. Mersey Docks and Harbour Board*, this Act would seem to have had a somewhat unexpected result. A widow brought an action against the Board, under Lord Campbell's Act, for the death of her husband. The man had sustained injuries in December, 1902, by falling into a lock, but he did not die as a result of these injuries until December, 1904, and the widow commenced her action within six months of his death—viz., on February, 1905. The Court of Appeal have held that the action was not maintainable, since by virtue of the above Act an action would not have been maintainable after such a lapse of time by the deceased man for personal injuries. The Legislation in 1846, when Lord Campbell's Act was passed, clearly intended that the defendants of deceased persons should have a right of action for the most serious loss they can sustain, and it is somewhat surprising to find this right interfered with by a statute passed merely to protect Public Authorities from being harassed by dilatory proceedings, yet this is the effect of the above decision if the injured person happens to linger more than six months. It is the more surprising since it has been held that the death of the person gives an entirely new cause of action, distinct from the action for personal injuries, and therefore in the above case the widow had no cause of action until it was statute barred. Possibly the opinion of the House of Lords will be sought on the point.

Middlesex Main Roads. At the meeting of the Middlesex County Council last week a course of action was decided upon which deserves the highest possible commendation. The decision to which we allude arose out of a motion by Mr. Fraser Black to the effect that a special committee should be appointed to co-operate with the neighbouring counties, and to enlist the assistance of Government, in formulating a scheme for the widening of all main roads leading out of London before the land on either side of these highways became further encroached upon by building operations. Many of these roads have been inconveniently narrow for years past, and accommodation for foot-passengers is by no means adequate. Since the advent of cycles, motor-cars, and tramways, traffic has increased to a remarkable extent, and the construction of tramway and light railway tracks has seriously diminished the space available for other vehicles. Moreover, it is no longer safe for foot-passengers to wander along the roadway as they have been accustomed to do, partly by choice and partly by necessity. The action of the Middlesex County Council reflects credit upon that body, and if their views meet with the support of the other authorities interested, the result will certainly be the saving of many millions of pounds during the next few decades.

Foundations for Columns. IN view of the increasing adaptation of columns to building construction, it may be well to direct attention to one or two points that do not always receive sufficient consideration. Let us take the case of a steel column supporting a heavy load, and provided with a cast-iron base, intended to distribute the load over the earth or substructure so as to keep unit pressure within safe limits. The lateral dimensions of the base may be ample, but unless the height of the casting is adequate the load will not be distributed in the manner anticipated. In the case of a column under exceptionally heavy load, it may be necessary to make the base with a height equal to its length, or alternatively to increase the sectional area of the column towards the bottom, with a proportionate reduction in the height of the cast-iron base.

Spherical or Conical Domes. IN a communication to the American Society of Civil Engineers, Mr. William Cain discusses the theory of spherical or conical domes of reinforced concrete or metal. Concrete-steel is a material excellently adapted to dome construction, for the concrete alone is perfectly able to take compression, which is the only kind of stress developed in the upper portion of such a structure, and the steel will withstand tension developed in the lower portion. Both analytical and graphical methods of solution are given by the author, the former applying to domes of constant thickness only, and the latter without any such limitation. We cannot here follow the mathematical demonstration of the author, but may mention that, among other points, it proves that, in a conical dome, the base of which is kept from spreading, as, for

instance, by means of a hoop, tension is nowhere exerted from its summit down. This type of design consequently is well adapted for sustaining a heavy weight, such as that of a lantern at its summit. A heavy weight at the top of a spherical dome, however, moves the joint of rupture upwards, and thus increases the area over which tension is evidenced. Here the advantage of concrete-steel becomes more especially manifested. The paper is one well deserving of careful study.

The Design of Concrete-Steel Arches. IN the current number of the *Proceedings* of the American Society of Civil Engineers, Mr. B. R. Leffler sets forth some short processes in the graphical analysis of the elastic arch, basing his treatment upon the method given by Mr. William Cain in his book on "Steel-Concrete Arches." The author of the paper gives calculations illustrating the manner in which the position of the true closing-line of the equilibrium polygon can be determined without difficulty. As his figures do not refer to actual examples of an arch, no force diagram or line of resistance are shown, but these can be found by the usual methods. One point to be noted by the designer of concrete-steel arches is that if the concrete section is adequate for resisting compression, steel is only required where the line of resistance passes out of the middle third of the plain concrete section. This is reasonable, because tension cannot be caused in the concrete unless the line of resistance passes outside the middle third. From this paper we gather that railway engineers in the United States are somewhat cautious with regard to concrete-steel arches, making the rings of considerable depth. In this event very little steel is required. It is for arch rings of shallow proportions that the value of reinforcement for resisting tension becomes particularly prominent.

Kingston Bridge. It appears that the widening of Kingston Bridge, which we thought had been abandoned, is to be carried out after all. The widening is to consist in an addition of about 30 ft. on the upstream side, so as to increase the total width to 55 ft., and provide room for the service of the London Electric Tramways Company. The laying of the cable is already begun across the bridge, and the tramway lines will, when completed, pass the terminus at Tooting in connexion with a large number of suburban districts in the northern parts of Surrey. The location of the bridge will be retained, and a joint committee of the County Councils of Middlesex and Surrey, who intend to retain, we are informed, as much as possible of the original character and architectural effect of the structure. We hope this will be the case, but we should like to hear that some competent architect was being consulted with regard to the work. When engineers get a matter of this kind in hand, it too often happens that previous assurances as to the preservation of the architectural character of an ancient structure are entirely forgotten, and the engineer puts his own stamp on the work.

An extensive property, consisting of Nos. 66-7-8, Haymarket, the five adjoining Nos. 10-2, St. Alban's-place, will shortly be offered for sale. The block stands upon Crown land, situated between the Haymarket and the Junior United Service Club, and includes the Western Synagogue, which was built about eighty years ago after R. Abraham's designs. Formerly known as the Westminster Synagogue, it claims to be the oldest synagogue in the west part of the town, having been founded, 1797, in Denmark-street, Strand, now part of the site of the Haymarket. The property we mention was held directly from the Crown for a term of ninety-seven years to expire on July 5, 1914, at an aggregate rental of £750. 10s. per annum; the ground rent and land-tax amount to 87l. 9s. The western portion stands on the site of St. James's-market, built in 1666 for Henry Jernyn, Earl of St. Albans, which enjoyed a high reputation in the XVIIth and XVIIIth centuries. St. James's Fair was removed to the market-place in July, 1665, from near St. James's Palace. Most of the market was pulled down by Nash for the laying-out of Waterloo-place and Regent-street, yet some of the market buildings survived on our own day. Six Bells-alley gave place to a thoroughfare which was since widened to 55 ft. for a better approach to, and in continuation of, Charles-street, St. James's-square, to the King's Theatre in the Haymarket. At the St. Alban's tavern, in St. Alban's-street, Mr. F. Dibdin founded the Roxburghe Club in 1812; Nance Oldfield quitted the Mire tavern for the stage; in a house on the south side of the poultry market and abutting on Market-lane, lived Hannah Lightfoot, the Quakeress, at a time when King George III., in his youth, often walked through the market on his way to and fro between St. James's Palace and his home in Leicester-fields.

THE executors of the late Mr. Staats Forbes have offered a real boon to all lovers of art by exhibiting to the public at the Grafton Gallery a large selection from the works collected during his lifetime by Mr. Forbes—a collector who really knew what to buy. The result is an exhibition of nearly four hundred paintings or drawings, mostly small, but of which it may be said that there is not one that is not worth looking at, while many are masterpieces. It is rarely that one has such an opportunity. Scarcely finding nineteen examples of *Blas together in one corner of a gallery!* All of these are good examples of the artist, including both his forest scenes and his figure subjects; and one of the former, the little landscape entitled "Pathway in the Wood" (130), is a thing to rave about. It would be impossible even to mention half the things that are of exceptional interest. The collection includes some beautiful works by Mr. Reynolds, "The Young Lovers" (17) and "Reverie" (39) especially to be noted; a number of examples of Millet, Maue, and J. Maris; some fine works by Whym, especially "Flock of Sheep Grazing the Downs" (82), a noble

picture; an exquisite work by Harpignies, "Landscape—Evening" (114); a number of Corots, one of them in his highest style; and other names represented are those of Dupré, Rousseau, Fantin-Latour, Daubigny, Mesdag, Vollon, Morland, Crome, etc., etc.; it is a feast of great things. There is also Millais' fine picture "The Orphans" (339) with its wonderfully painted rabbit. The exhibition is to be open till some time in July, and none who care for pictures should miss it.

Mr. Finn's
Water-Colour
Drawings.

MR. HERBERT J. FINN, who paints architectural subjects, with sea-pieces as a variation, has another exhibition of his work at Messrs. Dickinson's Gallery in Bond-street. Some of these we have seen exhibited before, but there are many important new works. Among the architectural subjects is a fine interior of St. Bartholomew-the-Great, Smithfield, two or three views of Gloucester and Wells, and a very fine one of Durham in winter (32), from a point of view not often taken—from the south-west; the view from the opposite side of the river has been more frequently painted from the north-west position. Some of the small sea-pieces are as good in their way as the architectural pictures; we may mention especially "Off Greenwich" (35), with the Hospital as a distant object, and a group of sail-barges giving an effective bit of colour in the centre of the picture.

THE NEW GALLERY.

We have not had space so far to notice the exhibition at the New Gallery, which is not a very remarkable one, but contains some fine portraits and some interesting landscapes. There are no figure pictures of the first order, for Mr. Smithers' "Dan Cupid Forging Chaynes" (171), ambitious enough in subject, is not interesting. Mr. Austen Brown's "Spring Pasture—Morning" (21) is good rather as a composition than in colour. In the South Room, where the numbers commence, Mr. Arthur Hacker's small picture "The Cup" (52), a back view of a female figure seated, holding up a cup, and partially draped in a richly-coloured stuff, is fine both in composition and colour, the more noticeable in the latter respect as colour is not in general this artist's strong point; and Mr. Alfred Hitchins' "Autumn" (31), a small half-nude figure among trees, is a pretty fancy. In the West Room Mr. G. Henry's life-size figure "The Satin Gown" (103), which might be a portrait but is not so called, is noticeable for the fine lines of composition made by pose of the figure and the lines into which her dress falls. In the North Room Mr. W. Wontner's "Nouronihar" (230), a three-quarter length of a girl in a picturesque costume, her figure defined by a closely fitting garment of grey stuff over which is partly thrown a brightly coloured cloak, is a highly finished painting with a sculptured marble background; and the girl's face is exceptionally lovely, but the whole is rather mechanical in its finish. On the opposite wall hangs Mrs. Rae's curiously prosaic picture with a poetic title—"In Listening Mood" (197), a picture of a very much dressed young lady with a "ravishing" hat, leaning against a tree in the middle of a wood; it reminds one rather of the back-woods heroine in Bret Harte's parody of Cooper's novels—"She took her parasol, drew on her lemon-coloured kid gloves, and plunged into the depths of the forest." Mrs. Swynerton's "Water-nymph" (187) is even more astounding in its incongruity, though in an opposite direction; a nymph of an exceedingly solid and alarming personality.

Among the portraits Mr. Sargent takes the most important place with his brilliant performance representing "Sir Frank Swettenham" (219), late Governor and Commander-in-Chief of the Straits Settlements, painted (as Jane Austen said of Mrs. Elton) "in all his

apparatus" of State Governor; a sumptuous chair and other belongings, beside which stands the Governor, a young-looking man in a light-coloured tropical costume, and face and hands browned by the heat. The attitude of the figure is a little awkward, but as a whole we like this picture, not only as a brilliant piece of painting, but as a sympathetic representation of the type of capable and self-reliant Englishman, taking his responsibilities in a light-hearted manner, of which our Indian and Colonial possessions have developed so many fine examples. Mr. J. J. Shannon's half-length of "Miss Kitty Shannon" (110), her head relieved against a mass of dark foliage, a bit of sky beyond with colour loaded on almost in relief, is a very bold and vigorous piece of work. On the other hand, his full-length of "Mrs. C. W. Lasell" (210) is what one would call not so much hold as "bumptious"—hardly the way to paint a lady. Sir George Reid has a good portrait of "Mr. Balfour Browne" (18), one of the order of portraits which aim simply at being likenesses, without any seeking after extraneous effect. In his portrait of "The Right Reverend James Moorhouse" (100) the head seems rather wooden.

Mr. Wetherbee has sent here what we take to be his best work of the year—it is superior to any that he has in the Royal Academy—"A May Dawn" (139), a bright landscape accentuated by a single figure of a shepherdess standing in the foreground knoll looking into the dawning light; a very poetic work. Among landscapes which have no aid from the introduction of figures, by far the finest is Mr. Arnold Priestman's "Barden Moor" (79), a real piece of landscape composition; in which respect it is worth while to compare it with Mr. Bertram Priestman's "The Cement Works" (252), which may be called a landscape without composition—two parallel banks and a river between them, crossed by one or two ragged trees in the foreground; forcible painting, but not a consistent whole. Mr. David Carr's "The Trout Stream" (60), a good landscape, shows on the other hand a very decisive treatment of composition; the sloping lines of the bank falling towards the left of the picture, and stopped, as it were, at the foot of the slope by the massing of a cottage and foliage. Mr. Fred Hall's "The Purbuck Hills" (71) bright in the sun but with a strong shadow in the foreground, is a well-designed landscape but with a curiously hard dry texture, which looks rather as if the author had aimed at an effect of surface which he has not quite realised. Mr. Amesby Brown's "After Rain," a road scene with horses, is an interesting attempt to convey the effect of a warm golden sunshine after a shower—a little too much of the gold perhaps, but it is a landscape with individuality, which is more than can be said of Mr. Parton's "Joyous June" (56), merely a repetition of its painter's well-known programme. Among landscapes which are of real interest are Mr. Adrian Stokes's "Afternoon in a Forest" (155), pillared trunks through which the sunlight throws flakes of light on the ground; Mr. Alfred East's "The Road to Longpré" (170); Mr. Leslie Thomson's long level landscape "Near Malmesbury" (240), and Mr. Harold Speed's "The Alcañtara, Toledo by Moonlight" (202), showing the well-known mediæval bridge under a new and picturesque aspect. In the Central Hall there is an interesting series of small landscape studies by Mr. Adrian Stokes (435 to 441), mostly in the South Tyrol.

The sculpture is not much to speak of. Miss Esther Moore has a powerful group on a small scale, entitled "The Mermaid" (514), and some other well-known sculptors are represented by busts and other small works. The Earl of Wemyss's life-size figure of "Venus at her Toilette" (519) is a highly creditable amateur work. Mr. Havard Thomas's "Lycidas" (533), the rejection of which by the Royal Academy has been so much commented on, we first saw before the demonstration was made about it, but failed to find in it those great qualities which we hear of. We certainly see no reason why it should have been rejected by the Academy, but we can see in it no more than a carefully modelled realistic nude posed in a rather ungainly attitude; nor can we find in it any relation to the title which it bears, which we should imagine had been tacked to it after the work was completed.

There are several cases of jewellery of more or less interest by Mr. A. Fisher, Mr. and Mrs. Gaskin, and others, which we have not space to consider in detail; and a large case in the centre of the Hall of work by M. Lucien Gaillard,

beautiful in execution, but in artistic style too much after the type of what are often summarised as "Articles de Paris."

NOTES AND SKETCHES IN SOUTHERN ITALY.—IX.

SIPONTO AND MANFREDONIA.

SIPONTO lies on the north-western shore of the Gulf of Manfredonia, below the promontory of Monte Gargano, about twenty miles to the east of Foggia. The Gulf of Manfredonia was known in antiquity as that of Urio, from the name of a city which was near the lake of Varano. The city is ancient; it is one of those with the foundation of which Diomedes is credited, and Strabo speaks of it as Sipus. It was more generally known as Sipontum, and had commercial relations with the Thracian Epidaurus on the opposite coast. It became a Roman colony in 194 B.C., and some antique remains have been found mixed up with those of the later city, which was abandoned when Manfred built Manfredonia in 1203 and moved the population thither. The remains of a temple of Diana were discovered in 1875, 30 ft. from the church, when a cistern was being cleaned out. The pavement was cut in the rock, and the cells was found and a little pilaster with a dedication to Diana by a certain Titus Tremelius Antiochus, freedman of Titus, which is now in the Museum at Naples. In a council held in 465 the name of Felix, Bishop of Siponto, occurs, and this is the first mention of it, though, according to tradition, the first bishop was S. Justin, who was consecrated during the life of the Virgin. Bishop Laurentius, to whom the archangel Michael is said to have appeared, causing the foundation of Monte S. Angelo in 493, was a cousin of Zeno, Emperor of Constantinople, who sent him money and workmen to assist in the decoration of his church. "When it was resolved to ornament with elegant and beautiful works the churches of S. Stephen and S. Agatha, situated near to the Adriatic shore, and to build another close to the city in honour of the blessed S. John Baptist, he wrote to the Emperor, hoping that their relationship would dispose him to receive his message favourably. He asked him to send him masters and workmen clever in all arts. The Emperor received the envoy of the holy bishop with joy, and charged himself with sending him the most accomplished artists; further, with devotion and liberality, he charged them to carry to Siponto 150 libras of gold to contribute to the execution of the works and help in finishing the church. Having received this precious gift, the holy man began and

finished admirable and precious works in the basilica of the aforesaid martyrs. Then he began another of a brilliant and wonderful beauty by different colours and little pieces of glass covered with gold with warm reflections, of which it was composed. He took care to do this work in honour of S. John Baptist in his episcopal church." The archbishops went up to Monte Gargano for a time, perhaps fearing the Saracens, and Leo IX. joined the see to Benevento and the ancient church fell into decay. Siponto was the first halting place for illustrious pilgrims whom the cult of S. Michael attracted to Monte S. Angelo, and here they venerated the image of the Virgin. According to Sarnelli, Paschal II. held a council at Siponto in 1117, when he consecrated the newly-built church of S. Maria Maggiore. This was the year of the Council of Benevento. The bones of Bishop Laurentius were placed near the high altar.

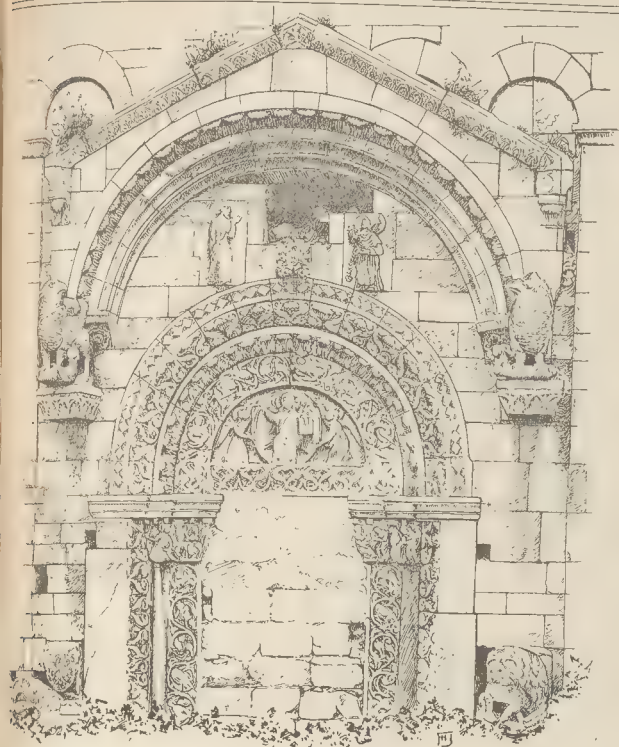
There is great resemblance in elevation between this cathedral and those of Troja, Foggia, and Pisa, which all show strong Oriental influence. The exterior is built of limestone of Vallona. At each side of the main door of the western façade are two diamond-shaped sinkings above each other under an arcade and half shafts like those of the Pisan churches; in each arch towards the angle is one on the lower level, the arcade thus consisting of five arches. The grounds of these diamonds are inlaid with various patterns. There appears to have been a continuous stylabate except on the façade. The door has a projecting curved hood richly carved, resting on pillars which themselves rest on lions with a low base, and above the lintel, which is carved and rests on corbels, is a small figure of a man. In front stand two shafts of small columns with sharply-cut foliage on the caps; they bear two lions. There was originally a low-pointed tympanum, the direction of which is shown by the end stones which remain. The southern side is much like the western façade, with a small apse in place of the door. The pilasters of its arcading have been inlaid with diagonal chequers. The cornice is dentilled, and was once deeper than it is now, as is shown by a piece which projects from the wall to the right. Here there are only three of the diamond-shaped sinkings on the low level and one on the higher, which is to the left of the apse. There was once a window in this, now walled up. The arch on the extreme right has a pretty round-headed window, with carved archivolts. The eastern side has also a rough apse with a window below, which lights the crypt. The architectural effect is damaged by additions of the XVIth, XVIIth, and XVIIIth centuries, to which period the bell turret of the western

façade also belongs. There is one very pretty window with an external band of interlaced pattern round it and a cable moulding within, beneath the arch on the right hand. The pattern is the same both within and without. The fourth side has been rebuilt, additions made of a sacristy and house for the custodian, and a stair of fifteen steps descends to the crypt. The plan is square, and, since the crypt is square with two apses, it must always have been so; and there is a continuous arcading round the three original sides—four columns to a side with a large central opening. The external measurement is about 64 ft., the thickness of the walls 3 ft. 3 in.; a central square of about 30 ft. is marked by four piers 4 ft. 4 in. square, which support four pointed arches. In the angles four columns are placed about 13 ft. from the ground, themselves much the same height, including base and cap, from which pointed ribs spring, at the summit of which is a circular drum, which has a hemispherical top and round-headed windows above the pointed arches. The apses have a quarter round wagon vault thrusting against the central square. The two apses are walled up internally, but in the crypt the eastern one is open, raised on two steps; it has two modern windows. The pointed arches are probably of the time of Charles I. of Anjou, who did work both at Siponto and Monte Sant'Angelo after Manfred had built his new cathedral in Manfredonia. The date of 1708 is on the lintel of the door of entry to the crypt, the plan of which is a square of about 48 ft. internal measure. Twenty-five bays of quadripartite vaulting cover it, with projecting ribs. There were originally twenty colonnettes—including the two couples at the sides of the apses—and corresponding corbels in the walls. There are now four great circular piers nearly 6 ft. in diameter, beneath the piers of the upper church. The granite colonnettes vary from 9 in. to 13 in. in diameter, and are all from more ancient buildings; the caps are all different, some classic, some with animals and vine leaves, etc., but all based on Corinthian. The walls are plastered, and the greatest height is just over 15 ft.

Sig. Avena hazards the suggestion that the ground has been steadily sinking, and that the church which Paschal II. consecrated in 1117 was built above the older church, so that in this crypt we may have the original early church, basing his suggestion upon the discovery of the temple of Diana at a level much below the present ground; and a may remark, as another fact in support of his theory, that the plan with three apses in cross shape is a reproduction of an Oriental plan of which several examples still exist in Greece, and resembles that of Germany



S. Maria Maggiore, Siponto: South Side.



North Door, S. Leonardo.

by Théodulphe, Bishop of Orleans. The building suffered much from earthquake in 1228 and 1229, as did the city. The pointed arches may have been added at this time to strengthen it, but the four large piers appear to be of the XVth century. There are no documents to give the dates of the building of the various parts, for the Turks in 1620 destroyed the cathedral and bishop's palace at Manfredonia, at which time the archives also were destroyed. The XVth century work is due to Cardinal Archbishop Antonio del Monte

(1506-11). His successor and nephew, Cardinal Archbishop Giovanni Maria del Monte (1512-44), later Pope Julius III., finished it, and Cardinal Archbishop Guinasio (1586-1609) restored it after the damage of the war. The dome is probably of this date. The interior arcade is ancient, the caps are mediæval, and the arches slightly horseshoe in shape. The celebrated Madonna is in the Byzantine manner, and is of course ascribed to S. Luke.

The city was destroyed by the Greeks in 963 during a war with the Lombards, and the Saracens sacked it more than once. In 869

they took Monte Sant' Angelo, fortified it, and held it for some time. From this place Alexander III. embarked for Venice when he went to conclude peace with Barbarossa in 1177. It was called the Porto di Capitanata. Conrad IV. disembarked here on January 8, 1252, to take possession of South Italy, and was received by Manfred, who gave up to him the provinces which he had reconquered. Three years later another earthquake destroyed the city (which was unhealthy through malaria also), and it was then that Manfred determined to found Manfredonia. His relation, Maelca, carried out the idea. In 1258 Siponto was pulled down so as to force the inhabitants to move, and the only remains now are two columns, one of which, without a cap, stands in front of the cathedral and one on a square base of masonry in the middle of a field some distance away, with a small iron cross on its cap, and some foundations of houses on the slope of the hill on the other side of the high road. Manfred built a new cathedral in Manfredonia and dedicated it to S. Lorenzo di Siponto, and in 1258 the Sipontine archbishop Ruggiero d'Anglona was able to take possession of it with his clergy, having all the rights and title of the ancient archbishopric which Manfred wished to move. The resulting dispute was only settled at the beginning of the XVth century, when S. Lorenzo in Manfredonia was made Vice-Metropolitan of S. Maria, Siponto, the archbishopric remaining at Siponto. The cathedral has a little cupola, but is quite modern inside, a nave without aisles having been reconstructed by Cardinal Orsini. The city was completed by the Angevins, and, after the burning by the Turks in 1620, was rebuilt. The archbishop's palace is close to the cathedral, built, after 1565, by Archbishops Tolomeo Galli and Domenico Guinasio; by the door are a few remains from Siponto and two fine Corinthian caps. The Municipio, formerly the Dominican convent, has a Romanesque doorway. There are a few balconies of a rather fine type, projecting on three-stepped corbels, the faces of which are carved in patterns. The ironwork is sometimes rococo in curve and sometimes simple upright bars with taller uprights at intervals bearing flowers. The castle was built by Maestro Giordano da Monte Sant' Angelo, Charles I. of Anjou's architect, who also built the walls, as Gregorovius says. Schulz ascribes its commencement to Pierre d'Agincourt, but says it was not completed till 1289 under Charles II. It is square in plan, with three round towers at the outside angles, but at the fourth (towards the city) a strong pentagonal bastion. Within are four more towers, three circular and one square. It defied Lantrec's assault, but the Turks took it. The town was given in fief by Giovanna II. of Naples to Sforza. Charles I. of Anjou tried to get it called Siponto Novello, but it still recalls the name of its founder, Manfred.



S. Leonardo: Western Façade of Church, etc.

All round the city the rocks are covered with the Cactus Opuntia, which bears the fruit known to English people as the Indian fig, and here and there in grassy glades with the grey rock emergent delightful dwarf irises, orchids, and the small blue gentian blossom profusely. Farther away, beyond Siponto, there are upland moors covered with asphodel, the large sort which grows as high as the shoulders of a horse and the smaller, both pink and yellow, and with the coarse grass snowed over with daisies and sprinkled with other flowers. To the south-east are the lagoon-like salt works, and beyond, the blue waters of the gulf of Manfredonia.

Some distance in the direction of Foggia is an interesting building which once belonged to a German knightly order and which is now a "masseria" or farm centre. It is still known as S. Leonardo, and retains portions of its original decoration. It was once one of the richest possessions of the order, and, according to Ughelli, produced an annual revenue of 20,000 florins of gold. There was a church, a hospital, and a monastery, and on the upper floor a fine kitchen of 1223 bearing considerable resemblance to that at Glastonbury. The cloister court is of late date and is now used for farm purposes, and mass is only said in the church once or twice a year—indeed, it is in a very dilapidated state—but on the north side there is a door which still retains much beautiful carving, XIIIth century in style, some of it as sharp as the day it was finished. A broad band of arabesques, in which are intertwined beasts and birds, etc., surrounds the door aperture (now closed up), and the tympanum between the round arch and the carved lintel bears a sculpture of Christ seated on the rainbow, holding an open book and blessing, in a vesica supported by two angels. The caps of two colonnettes are carved with stumpy figures, on one side the Adoration of the Kings, on the other Balaam and the Angel. In the wall above are two figures in monkish costume, one of which bears a chain (S. Leonard was the protector of prisoners), and between and above them is a hole, which we were told was made in a search for treasure. The half-length of S. Leonard, which is now in a dark corner of the church, with hood and chain on his shoulder, probably once occupied this place. Above is another moulded and carved arch and a pedimented head. The wall shows irregular round-arched arcading. There were two lions at the base of the door, bearing columns on their backs, with griffins above the caps; this part is much dilapidated.

The church had two domes on pendentives and three apses, with half-wagon vaulted aisles, one of which still exists. The domes were over the sanctuary and at the west end, the intermediate bay having a pointed wagon vault. The western cupola is still intact; it has an octagonal drum with external arcading and a pyramidal roof. The apse cupola has been rebuilt. To the north of the nave is a vaulted chapel of the XVth century. The first pier is much the same as those of the choir at Molfetta and one of those of the portico of Ommissanti, Trani. The others have mouldings, but no carvings. The aisles have pointed arches below the half-wagon vault, as at Molfetta. The central apse has a window with a griffin above it externally and monsters in high relief hanging from the cornice. The façade is divided by four pilaster strips and has two more at the angles; the mouldings of the impost of the central door are carried across four of them. There is a round-arched corbel at the summit which ramps over the aisle, and the arrangement suggests a tower at one side originally and another added for defence at the other side. The church existed in the XIIIth century, and had a prior, and a chapter, but the fine door may be of the period of Frederick II., a little later. I was disappointed in gaining admission to the kitchen, which is used by the master of the place as his private room and was locked up. F. H. J.

CONGREGATIONAL CHURCH, KILLMARSH, DERRY-SHIRE.—The opening of the new Congregational Church at Killmarsh took place on Easter Monday. The building is of Dunford stone and is a Gothic structure, with two transepts, chancel, and two vestries, with seating accommodation for 410 people. The woodwork is of polished pitch pine. Mr. Cecil Jackson, of Chesterfield, is the architect. The building contract was let to Messrs. W. Maule & Co., builders and contractors, Nottingham and Chesterfield. The approximate estimate of the cost of the church, exclusive of the site and free labour, is 2,170*l*.

TENDENCIES IN MODERN ARCHITECTURE.

PROFESSOR C. H. REILLY, M.A., A.R.I.B.A., who was appointed some little time ago to the Roscoe Chair of Art and Architecture in the University of Liverpool, in succession to Professor Simpson, delivered an inaugural lecture in the Arts Theatre, Liverpool, on the 4th inst. He took as his subject "Some Tendencies in Modern Architecture," and in the course of his remarks he pointed out that until the close of the XVIIIth century there was always observable in the architecture of this country a dignity, reticence, and restraint which, whether buildings were in the Gothic, Renaissance, or Classical style, marked them off as different from buildings in the corresponding styles on the Continent. The work both of Inigo Jones and of Wren bore this peculiarly English impress. Unfortunately, at the end of the XVIIIth century, the continuity of the native tradition in English architecture was broken. With the Victorian era there came in a so-called freedom of treatment which offered encouragement to a variety of shams. Amid the confusion there arose what had been termed the Gothic revival; but since moral enthusiasm was not art, and since the old cathedrals were a growth representing an ideal which it was not possible now to revive, the most effective examples of modern Gothic were those which departed most freely from archaic models. In these circumstances two tendencies in modern English architecture showed themselves. One was an effort to pick up the thread of English tradition where it had been dropped a century ago, and the other was an endeavour to deal with materials in an artistic spirit. The first was shown in the public buildings erected in recent years by municipal authorities, cases in which designs were usually chosen after competition. The idea which in those cases the architect had to express was the dignity of civic life, and since outside of dignity were associated with the pillared halls, the ample flights of steps, and the impressive vistas of Roman architecture, that style had mostly been adopted as appropriate. He failed to see why classic forms should not be adapted to modern needs, both public and private. If the mistake at the end of the XVIIIth century had been an attempt to make the cottage and the villa look like a mansion, the mistake at the end of the XIXth century was making the mansion look like a cottage, and garnishing the drawing-room with the furniture and utensils of the kitchen. He pleaded for the value of the classic style, modified by English taste in domestic as well as in public architecture. The old streets and squares of Bath were the ideal of privacy and restraint, and the growing taste for antique furniture, which was as different from modern as a Nottingham curtain from a piece of old lace, pointed to a return to the ample rooms and handsome staircases of the older style. A new trade pattern chimney-piece was a blot in a room furnished with pieces by Chippendale or Hepplethwaite. There were in Liverpool many old houses, not unlike those at Bath, containing beautiful antique work, which the students of the School of Architecture proposed to study. Their drawings with notes would be published from time to time in order to preserve a record of these remains of good taste. He regretted that the street arrangements of English towns to-day were not generally favourable to good architectural treatment, improvements leaving irregularly-shaped sites, which no architect could deal with to advantage. On the other hand, architecture following English tradition allowed of a union of sculpture and architecture which would be good for both arts. St. George's Hall, for example, would gain greatly in dignity were its pedestals filled with the statues for which they were intended. Professor Reilly proceeded to remark upon the selection of materials as an important part of style, and cited various examples of buildings which owed the whole of their effect to the material and its treatment. The recognition of this by architects was one of the most hopeful signs of the architectural revival.

WESLEYAN CHAPEL, SCARBOROUGH.—The foundation-stones were recently laid of a new Wesleyan chapel which is to be erected at the corner of Hoxton-road and Columbus-ravine, Scarborough. The building will have the Sunday school and four vestries on the ground floor, and the chapel proper above. Seating accommodation will be provided in chapel for 350 persons, and in the school for 360 children. It is being erected from plans prepared by Mr. F. A. Tugwell.

RESIDENTIAL FLATS

At a meeting of the Royal Sanitary Institute, held at the Institute on Monday evening, under the chairmanship of Sir Wm. Emerson, a discussion took place on "Housing in Mansions let as Flats."

Dr. Louis C. Parkes (Medical Officer of Health for the Metropolitan Borough of Chelsea) opened the proceedings with a paper in which he dealt with the question chiefly from the point of view of the effect on the health of the people. He referred to the statistics of the late Dr. Farr and other early pioneers of vital statistics, in which it was proved that density of population on area was an essential cause of a high death-rate, and said that now with the great advances which had been made in the science of domestic sanitation it appeared possible to house large numbers on a small area under perfectly healthy conditions. It was, however, too early to accept without qualification this statement. They might conclude, however, that if flats were an evil they appeared to be a necessary evil, their growth in London being dependent upon the increase in the value of land in nearly all residential districts. He thought, however, that the development of the motor-car would probably be effective in time in providing an antidote for the continually ascending price of land. With private motor-cars for the wealthy, and with electric railways, tube railways, electric tramways, and motor omnibuses for the ordinary citizen, who would care to live in central London, with its enervating smoke-laden atmosphere and its perpetual noise, rattle, and worry?

Mr. W. Rolfe said that the subject for discussion, "Housing in Mansions let as Flats," which he was to bring before them, concerned a gradual development of that class of building during the past thirty years. It had not been carried out systematically, as in Paris or Berlin, and certainly not with the rapid growth of New York, but rather with the adaptation of sites from time to time as separate buildings, and not built in sequence in new thoroughfares. Had Wren's or other more recent street arrangements been carried out, London to-day probably would not contain whole streets of this class of buildings. So far as he could see, London never would be a city of flats. Did the housing of residents in flats meet a want? For the purposes of that discussion he would confine attention to a radius of one or two miles from Charing Cross. Flats in the best positions should realise rental values of from 800*l*. to 80*l*. per annum, the first to have ample accommodation for servants, and the second accommodation for one or two persons. Many who elected such residences kept no conveyance, so that the sites should be near to travelling facilities. Crowded situations, positions where outlook, rear space, etc., could not be provided, should be avoided. The situation of two streets was a good position, but a better was a building fronted on to a street and had in its rear an open garden or square. It was important also to consider the sunny aspect of such buildings. He thought that the main features of flats as residences were a maximum of accommodation in a minimum of space. The principal entrance to such a building should be central, with a good hall with carpeted, wide staircase, well lighted, it should, where there was a passenger lift it should, where practicable, be worked by electricity. Then the landings of the stairs on each floor should be roomy and well lighted, and the stairway should be carried right up to the roof flat, should be carried right up to the roof flat, vary according to position and rental value, it should consist of a hall, a good-sized reception-room, and a dining-room. Leading from the hall there should be a corridor on which the bedrooms should open, and a good one with a good outlook. There should also be a bath-room and a water-closet, and a store and wine cupboard, while the kitchen should be approached from a special passage leading from the hall to a pantry for washing glass and cleaning plates. In was quite as necessary as a good one with a good outlook. There should also be a bath-room and a water-closet, and a store and wine cupboard, while the kitchen should be approached from a special passage leading from the hall to a pantry for washing glass and cleaning plates. In was quite as necessary as a good one with a good outlook. 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modated in the middle area or side areas, no one should be free access to the foot of each flat. Apart from other reasons there was objection to flats over shops—the great difficulty of providing good drainage. For the drainage system glazed stoneware pipes in concrete were preferable to iron pipes and the joints of manholes should be glazed. Dustbins of galvanised iron should be provided and the dry refuse should be kept from the wet. As a rule he had found that fireplaces in flats were too large and the rooms were overheated in consequence. All fireplaces, therefore, should be provided with blowers and fresh air intakes. The great point to be considered in designing the floors was that they should be fire-resisting and sound proof. Concrete encasing steel joists was the best form of construction; and there should be a space between the upper side of the concrete and the wood floor. Where there were fire escape stairs they should be solid and formed with the building, for he considered that the open iron stairs which were used were questionable in case of panic. In conclusion, he remarked that there should be a good telephone system from each flat to the entrance hall, and the bell and electric light wires should be made to be inspected.

Dr. Sykes, Medical Officer for St. Pancras, did not think the price of land in the centre of London would fall, but that it would continue to rise. He believed central London would become a city of flats like every other big city in the world. The great necessity for flats from the health point of view was through ventilation.

Mr. F. Hooper remarked that those who had been associated with clearance schemes in London had at first felt great satisfaction at the result, but it must be remembered that the first tenants in the erected flats were all picked persons. He felt that one of the essentials of flats must be the adoption of methods to deaden sound.

Professor Kenwood deplored the miserable accommodation invariably provided for servants in flats, and believed it must have a prejudicial effect on health.

Mr. Turner considered that every facility in the way of tramways, etc., should be given to enable working men to live out of the centre of London. The rooms in the present artisans' dwellings were in his opinion too small.

Mr. J. White, L.C.C., thought that those who looked designing or building flats should first be in them to note the defects. He had lived in a flat, and when he commenced to build flats he introduced various things to deaden noise and to give proper ventilation to the buildings.

Dr. Cockburn also considered that ventilation was the chief thing to be aimed at in the building of flats, and he especially emphasised the necessity of cross ventilation in front of the window-closets.

The Chairman said he, for one, could not believe that the crowding on small areas was a good thing. It might be that, so far, they had been lucky in escaping an epidemic, but what would happen if there was a great outbreak of infectious disease?

Notes of thanks to the readers of the papers and to the Chairman concluded the proceedings.

HOUSING AND CHEAP COTTAGES.

A MEETING in support of the Cheap Cottages Exhibition, to be held at Letchworth (Garden City), from July 15 to September 30, as a practical effort towards the solution of the housing problem, was held on Wednesday at Westminster Palace Hotel, the Earl of Onslow, G.C.M.G., presiding.

The Chairman said he had received a letter from Mr. Alwyn Fellowes, President of the Board of Agriculture, regretting his inability to be present, and stating that he wished the undertaking every success. The Chairman, proceeding, said that the meeting was of great public interest and importance. There were three necessities for cottage accommodation—cheapness, decency, and sanitation. There was a great dearth of labour throughout the mid districts of England, mainly because it was difficult to find housing accommodation. Unless they could provide comfortable and decent houses they could not expect to increase the number of small holders of land, and he believed that the system of small holdings was the only practicable step which could be taken towards getting the people back to the land.

They had heard a great deal on the subject of by-laws, and then some persons suggested that the agitation against by-laws in rural districts was got up by the landowners because they wanted jerry-built cottages on their estates. As a member of that class he indignantly repudiated that slander on their intentions. They wanted by-laws; but the by-laws must be elastic and suitable for the locality. Fixed by-laws which worked well in London were not always suitable for the country. If they were to provide cottages at all they could only do it on the condition that they could erect them cheaply, and if they could show on the spot a sound and sanitary cottage which could be put up for £150, or even less, and if they could produce contractors who would say they were prepared to erect those cottages on any man's estate and show that they were in accordance with the model rural by-laws of the Local Government Board, to which he took no exception whatever, then there would be a great increase throughout the country of men who would be willing to have such cottages put up, and the housing question would be solved.

Lord Hylton moved:—"That this meeting pledges itself to support the Cheap Cottages Exhibition as a practical effort towards the solution of the housing problem."

This was seconded by Mr. Crooks, M.P., who said he wanted cheap cottages built so as to encourage people to stop in the country instead of flocking into the towns. He expressed the hope that when the cheap cottages were built the owners would be content with a moderate return on their outlay—say 4 per cent., or whatever was fair. With that proviso he welcomed the project. They would not rear an Imperial race in slums and hovels. They wanted cottages adequate for bringing up a family in a proper manner.

The resolution was supported by Sir Walter Lawrence, who said that, from the landowner's point of view, even cheap cottages repaid the landlord, for by providing good, decent homes he got better labour for his money.

Lord Carrington said that it was absolutely necessary that money should be advanced by the State for the building of cottages.

Several other speakers said that, in their opinion, the rush to the towns was not a rush for life and gaiety, but was largely due to the want of decent and cheap cottages in the country.

The resolution was carried unanimously.

THE ART UNION OF LONDON.

THE general meeting of members of the Art Union of London was held in the Lecture Hall of the Society of Arts, John-street, Adelphi, on the 5th inst., to receive the report of the Council and to distribute the prizes of works of art for the year 1904-1905. The chair was occupied by Lord Windsor, the President, who moved the adoption of the report, and Mr. R. B. Martin, M.P., seconded.

The Council stated that the amount of the subscriptions for the year now ending had enabled them, after setting aside 1,227l. for the works of art presented to subscribers, to devote the sum of 436l. 4s. to the prizes to be distributed, making, with the consolation prizes awarded to unsuccessful members, a total of 183 prizes. The Council had selected from among a number of works submitted to them a few small water-colour drawings, which would be included as minor prizes, and also copies of Miss Canton's little statuary group, "The Minuet," the copyright of which the Society has recently purchased from the artist. The work has been reproduced by Messrs Dellagana, by the method known as "Kupronising." Among the prizes were some Rouge Flambe Bowls which had been produced by Messrs. Doulton at their Burslem works. This ware, the peculiarity of which is its glowing ruby-red glaze, is one of the latest developments of the modern potter's art, for, says the report, although its prototype is to be found in a few surviving and priceless specimens of old Chinese porcelain, the secret of its production has been lost for centuries, and it is only within the last year or two that the effort to re-discover it, an effort which has involved the most prolonged and patient experiments and great expenditure of money, has been rewarded with success.

The coming October 21 being the centenary of the Battle of Trafalgar and of the death of Nelson, the Council have commissioned from Mr. W. L. Wyllie, A.R.A., in commemoration of the occasion, an etching from his painting of "Trafalgar," on exhibition at the Royal

Academy. The moment the artist has chosen to depict is about half-past two in the afternoon, and the "Victory" is seen just casting off from the "Redoubtable," after the duel in which Nelson received his death wound.

The injury which has resulted to the status of the British engraver and his art from the long-continued popular preference for photographic process work, and from the absence of adequate opportunity for the study of engraving, has for some time engaged the attention of the Council. Happily, within the last two or three years there has been a distinct revival of favour for pure engraving, and the Council, feeling that the moment was opportune seriously to consider the feasibility of establishing a properly-equipped engraving school on national lines, addressed representations in the matter to the authorities. The following reply from the Royal Academy is published with the Academy's permission:—"The President and Council are in agreement with the opinion that there is a promise of better conditions for the art in the reaction which has set in against one of these causes—the photographic reproduction of paintings—a reaction which has certainly led to a revival of the art; and the Academy has already decided solemnly to put in force the rule enabling it to elect engravers into its body—a rule which through the almost complete decay of the art had for some years fallen into abeyance. When this is done the Academy will be in a better position to take up the subject and to consider the feasibility of establishing a school of engraving, as to the desirability of which they are in complete accordance with the views of the Art Union."

That it was high time something was done to restore to British engraving the prestige it once enjoyed was evident from the fact that for the reproduction of so essentially national a work as Mr. Abbey's Coronation picture the publishers have had recourse to the services of an eminent foreign etcher.

Negotiations with the Canadian Government with a view to an amendment of the recent law prohibiting the operations of art unions throughout the Dominion were still proceeding, and strong hopes are entertained that the opposition to the amendment, which was confined to the representatives of a single province in the Dominion, might eventually be overcome.

The report then refers to the additions made during the year to the National Gallery and other art galleries. In reference to the British Museum, it is stated that there has been some notable acquisitions made, of which three Greek bronzes were the chief. A warrior on horseback, dating from the Vth century, was one of the finest archaic pieces that had come down to us, and was exhibited in 1903 at the Burlington Fine Arts Club. The second, believed to date from about 400 B.C., was a relief, "Venus and Anchises on Mount Ida," found at Parameythia towards the end of the XVIIIth century, and was bought for 2,250l. at the Hawkins' sale in June. The third bronze was a figure of Hermes, about 8 in. high, the base of which was restored by Flaxman. In the print room many of the new acquisitions, perhaps a thousand or more items, were from the bequest of William Arnold Sandby. Then there was a set of early proofs of Whistler lithographs, presented by Mr. T. R. Way; landscape sketches by the late Thomas Collier; two copperplates and seven wood blocks by Edward Calvert; lithographic portraits by Mr. Will Rothenstein; and Mr. William Mitchell had added to his valuable gift of nine years ago by presenting 160 volumes containing woodcuts of the early German school. Among these are copies of the "Quatuor Libri Amorum," 1502, and "Works of Hrosvita," 1501, with many fine specimens of Holbein and Dürer.

The purchases made by the President and Council for the Chantrey Collection in 1904 were the pictures "London River," by Mr. Napier Henry, A.R.A., and "Fate," by Mr. Arthur Wardle; and the sculpture in marble by Mr. Pegram, A.R.A., called "Sybilla Fatidica." The prolonged agitation for reforms in the administration of the Chantrey Bequest resulted in the appointment in June of a Select Committee of Inquiry, which commenced its sittings in July. The bequest first came into operation in 1877, and since then 109 works had been purchased, and are now exhibited as the Chantrey Collection at the National Gallery of British Art. It had been contended that the selection of works was too strictly confined to the Royal Academy Exhibitions, and that in this way a representative collection of British art could not be formed; that, as a

matter of fact, some of the most famous and distinguished artists of the period were entirely unrepresented in the collection. The Committee took evidence on these points (as far as evidence could be given on matters of opinion) from the President and many members of the Royal Academy, and from well-known critics and writers on art. The evidence given before the Committee showed clearly that, whatever opinions as to the artistic merits of the collection may be held, the cause of complaint may lie in the terms of the will of Sir Francis Chantrey as well as in the manner of the carrying out of those terms by the body to whom the duty was entrusted by him. The alteration of the will itself was, of course, a matter for Parliament, and until Parliament found time therefore to make some change, it was probable that the Academy would continue to act, as heretofore, in accordance with what they conceive to have been the intentions of Chantrey as expressed in his will.

The President, in moving the adoption of the report, said it was gratifying to feel that the depression due to the South African war was giving place to a more satisfactory state of things. After remarking that important additions had been made during the past year to the national art collections, he said that considerable additions to the buildings of the British Museum had been begun. On the opposite side to the front of the Museum a most important addition was going to be made, principally for the library, and that addition was part of what ultimately would be the completion of the four sides of the Museum.

The report having been adopted, the drawings for the various prizes took place. The prize of 100*l.* was taken by Mr. J. H. Bentley, of Folkestone.

A vote of thanks to Lord Windsor for presiding was heartily agreed to, on the motion of Mr. Mackrell.

THE SURVEYORS' INSTITUTION. PROFESSIONAL EXAMINATIONS, 1905.

The following student candidates have passed the examination for the Professional Associate :-

Allen, O. W., London.
Bamster, M. D., Hayward's Heath.
Barons, B. A., Exeter.
Bayne, B. G., London.
Bentley, A. W., Regent's Park, N.W.
Blake, R. L., Southsea.
Blomfield, C. G., Lewisham.
Bradley, C. G., Barrow-in-Furness.
Bray, J. S., Exeter.
Brizand, J. J., Shortlands.
Burge, J. T., Clifton, Bristol.
Burkitt, H., Bishop Auckland.
Burnett, L. T., Croydon.
Burstall, A. C., Wimbledon.
Carpenter, L., London.
Carver, J. E., Brixton, S.W.
Chamberlain, H. S., Southsea.
Clark, D. W., Twickenham.
Clark, L. V., Brockley, S.E.
Clark, R. M., Dover.
Corfield, A. K., Northenden, Cheshire.
Cox, D. H., North Finchley, N.
Oxon, H. A., Surbiton.
Dampney, C. J., Ealing, W.
Eastman, A. G., Beckenham.
Ellis, C. E., Enfield.
Emery, D. W., Cosham.
Ferre, G. C., Harlesden, N.W.
Fitch, E., London.
Gibson, P. S., Uxbridge.
Giles, S. L. C., Putney.
Gowing, C. T., Sprowston, Norwich.
Gudgong, H. L., Southsea.
Hallam, F. V., Lewisham, S.E.
Harris, B. C., Wandsworth Common, S.W.
Harrison, H. P., Winshall, Burton-on-Trent.
Haynes, J. W., Brighton.
Hayton, J. D. W., Muswell Hill, N.
Hayward, A. L., Walmer.
Hazard, G. J., Stoke Newington, N.
Henderson, C. E., Aspatia, W.
Hennell, C. M., Kensington, W.
Hepworth, E. A., Chesham Hill, Manchester.
Hollis, R. E., Windsor.
Hosking, H. A., Ladbroke, St. Germans.
Hurcomb, E. F., Oxford.
Jennings, L. D., Hayward's Heath.
Kloze, H. J., Hampstead, N.W.
LeMay, T. D., Tonbridge.
Loran, J. A., Cokfield.
Lyne, H., Brigg.
McDonald, D. R., Streatham, S.W.
Malomed, H., London.
Mathews, H. S., Edgborough, Birmingham.
Newhouse, E., Slyn, Lancashire.
Nuttall, G. P., Bury.
Palmer, C. D., Norwich.
Perkins, S. B., East Stonehouse.
Petrie, A. R., New Barnet.
Power, P. T., Walton-on-Thames.
Priest, A., Keynsham, near Bristol.
Procter, C. H., Bury-in-Wharfedale, near Leeds.
Reeve, G. N., Croydon.
Richardson, G., Leeds.
Richardson, W. S., Muswell Hill, N.
Rodwell, L. H., Aspatia.
Rogers, L. S., Croydon.
Rowland, H. E., Aylesbury.
Royce, B., Leicester.
Ryde, J. T., Woking.
Scammell, T. E., Hither Green, Catford, S.E.
Shepherd, J. E., Canonbury, N.
Smith, H. F. G., Southampton.
Smith, P., Ripon.
Smith, W. B., Rushden.
Spreckley, R. O., Hereford.
Stacey, M. B., Reigate.
Stimson, D. C., Brixton Hill, S.W.
Sturt, L., Tollington Park, N.
Talbot, C. G., Beckenham.
Thynne, R. L., Wandsworth Common, S.W.
Tivendale, T., Highbury Hill, N.
Vining, E. L. R., Sydenham, S.E.
Wegelin, J. D. R., Croydon.
Wickenden, E., Tunbridge Wells.
Wightman, W. O., Purley.
Willmott, J. P., Ealing, W.
Wykes, H. W., Clapham Common, S.W.
Young, S., Lewes.

* Institution Prize. † Special Prize. § Penfold Silver Medal. ‡ Beadell Prize.

Candidate—Scotland.

Makins, J. V., Glasgow.

Candidate—Ireland.

Montgomery, W. A., Belfast.

The following non-student candidates have also passed the examination for the Professional Associateship :-

Allfrey, H. L., Winchester, R.S.O.
Andrew, R. C., Newport, Salop.
Aylward, G. T., Bassett, Southampton.
Badcock, G. S., Brighton.
Ballantine, H., Englefield Green.
Ballard, W. B., Handsworth, Birmingham.
Barnard, D. C., Aspatia, Cumberland.
Bayes, J. G., Radlett, R.S.O.
Bevis, G. T., Southsea.
Biker, W. J. E., Harrogate.
Blaber, M., Shoreham.
Bladen, L. M. W., Stone, Staffordshire.
Blencowe, S., Torpoint, Cornwall.
Bones, O. J., Newcastle-on-Tyne.
Boyd, R. H., Upper Tooting, S.W.
Brackett, J. S., London.
Brander, F. W., Surbiton.
Briggs, D. D., Kew.
Browne, H. G., Bromley.
Budgett, W. H., Finchley, N.
Bulcock, B., Mitcham.
Burbridge, J. S., Lewes.
Burn, J., Potters Bar, N.
Burr, T. A., Hampstead, N.W.
Burt, J. T., Leicester.
Carney, W. H., Wandsworth Common, W.
Cator, C. A. M., Norwich.
Child, G. M., Kew Gardens.
Clark, C. H., Kensington, W.
Clarke, P. C., Richmond.
Clarke, T. G., Llandaff.
Copley, H. R., Southend-on-Sea.
Crother, W. S., Highbury, N.
Culverwell, W., Crouch End, N.
Curtiss, E. H., Bayswater, W.
Dallimore, N. E., Herne Hill, S.E.
Dalzell, W. D., Stanwick, Carlisle.
Dannatt, P. B., Blackheath, S.E.
Davenport, H., Putney, S.W.
Dawson, R., Barking.
Deacon, R. W., Jun., Brixton, S.W.
Duckworth, W. E., Yattoo, Somerset.
Dunn, W., London.
Dunbridge, E., London.
Dyke, H. G., London.
Ellen, E. C., Antwerp.
Evans, B. G., Wandsworth Common, S.W.
Evans, E. D., Wandsworth Common, S.W.
Ewin, J. C., Hornsey, N.
Fairweather, N. B., Streatham Hill, S.W.
Featherstonehaugh, E. W., London.
Feltham, A. W., Alton.
Fife, J. D., Potters Bar.
Fisher, T. G., Wembley.
Fisher, T. R., Plymouth.
Fogg, T. H., Babbacombe, Torquay.
Fortune, S. H., Bath.
Foster, G., Richmond, Surrey.
Gallop, W. J., Stroud.
Gardner, J., Richmond, Surrey.
Garnham, E. A. V., Wealdstone, Harrow.
Gee, A. H., Marlborough.
Gibson, A. K., Chippenham, Wiltshire.
Gibson, F. M., Gillingham.
Glenn, G. F., London.
Gluckstein, S. A., Canonbury, N.
Gowland, L. L., Tooting Common, S.W.
Graham, H. C., Letchworth, near Hitchin.
Gray, T. C., Finchley, N.
Gray, W. E., Canterbury.
Hagger, A. J., St. Leonards, Bath, P. S., Dublin.
Hall, P. S., Dublin.
Hall, S., Haslingden.
Harris, K. D., High Wycombe.
Harrison A. B., Aylestone, Leicester.
Hawkes, G. C., London.
Heald, H. M., Leeds.
Hendra, A. J., London.
Hepworth, H. R., Wakefield.
Hewitt, F., Balham, S.W.

* Driver Prize.

Sutton, C. J. N., Woking.
Symes, J. G., New Cross, S.E.
Taylor, W. G., Harwell.
Tea, J. E., Douglas, Isle of Man.
Tossdale, G. W., Dartford.
Thatcher, I. J., Montpellier, Bristol.
Thomas, A. J., Swansea.
Thomas, F. C., Leyton, Essex.
Thomas, F. J., Swansea.
Turner, B. G., Walmer.
Turner, H. C. P., Brixton, S.W.
Tysar, G. L., Hampstead, N.W.
Upton, T. H., Petworth.
Vernon, A. S., High Wycombe.
Waddington, C. C., Hampstead, N.W.

Waller, H., Bicester.
Waterman, A., Fulham, road, S.W.
Watkins, H. A., West Norwood, S.W.
Wheeler, F. E., Acton, W.
White, A. L., Stamford.
White, J. W. E., Tunbridge Wells.
Wickenden, A. F., Tunbridge Wells.
Williams, C., Wembley.
Wood, H. R., Brixton.
Woodward, H. G., Slough.
Worley, F. E., Green-lanes, N.

Worth, C. P., Brentford.
Young, H. B., Streatham, S.W.

Candidates—Scotland.

Blair, W., Greenock, N.B.
Caruth, A., Kilmarchan, N.B.

Candidate—Ireland.

Fowler, C. K., Dromahair, Co. Leitrim.

The following Professional Associates have passed the Fellowship examination

Allen, L. H., Upper Clapton, N.E.
Anderson, H., Portmadoc, N.E.
Ash, H. J., Stamford.
Bare, A. E., London.
Bedford, C. B., Acton, W.
Benjamin, A. F., Hyde Park, W.
Botson, F. R., Bedford.
Blair, J. W., Nuneston.
Boddington, P. E., Willesden Green, N.W.
Broad, S. W., Acton, W.
Brown, A. F., London.
Bulley, H. W., Exeter.
Burrows, R. H., Halesham.
Chastell, A. P., London.
Coates, L. C., London.
Crump, E. H., Hinkley.
Cubitt, H. W., London.
Culver, H. G., Twickenham.
Dadd, C. J. T., London.
Davies, L. O., Ealing.
Drake, F. A., Ealing, W.
Dunt, J. H., Streatham Common, S.W.
Dutton, R. C., Bromley, Kent.
Elliot, J. W. F., Salcombe, R.S.O.
Ermen, C. E. A., Chester.
Fairchild, E. J., London.
Farman, W. A., Sidcup, S.W.
Fitch, S., High Wycombe.
Foster, W., London.
Francis, R. G., St. Cornard, Sudbury.
Genders, P. R., Wandsworth Common, S.W.
Glasier, E. G., Wimbledon, S.W.
Goodchild, W. C., Goodmayes.
Griffith, J. B., Woking.
Hanson, H., Edgerton, Huddersfield.
Harrington, C. R., East Grinstead.
Hards, J. F. S., Westminster, S.W.
Harrington, J. J., London.
Hay, P. G., Wallington.
Haward, J., Bath.
Heath, J. L., Clissold Park, N.
Hewitt, F., Streatham, N.W.
Hinton, H. A., Highgate, N.
Hoare, A. J., Clapham, S.W.
Hodges, W. W., Croydon.
Huggins, E. G., Highbury, N.
Ingram, J. F., Lewes.
Inley, G. P., Bournemouth.
Jones, A. B., Newcastle, Staffordshire.
Kee, J. D., Highbury, N.
Knox, J. D., Highbury, N.
Living, R., Plaistow.
Lohan, G. T., London.
Lurea, J. C., Lewes.
Lush, W. M., Balham, S.W.
Madue, W., London.

* Crawley Prize. † Galsworthy Prize. ‡ Penfold Gold Medal.

The following candidates have passed the Direct Fellowship examination

Champion, P., Darnley, near Wigan.
Jackson, R., Warrington, near Wigan.
Nicholson, G. M., London.
Schy, R., Barrow-in-Furness.

Candidate—Ireland.

Hargrave, W. H., Dublin.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—A party of members of the Edinburgh Architectural Association visited Niddrie Marischal on Saturday, who acted as leader, made reference to the article on the house and the family contributed to the published transactions of the Association by Mr. Thomas Ross, and thereafter led the party over the buildings and grounds. Much interest was evinced in the old tower, begun about 1600, and converted into a spacious staircase to serve the south wing, which was built by Sir John Wauchope. The tower succeeded to the estate about 1632. Sir John afterwards decorated the dining-room, which still existing, with devices in honour of James II. On the motion of the President, Mr. Barbour, a vote of thanks was heartily accorded to Mrs. Wauchope, and the services of the leader acknowledged.

LEEDS AND YORKSHIRE ARCHITECTURAL ASSOCIATION.—The following is the list of officers elected for the year commencing May 1, 1905:—President—Mr. G. Bertram Bulmer; Vice-presidents—Messrs. H. S. Chorley and W. G. Gillison; Hon. Treasurer—Mr. W. H. Thorp; Librarian—Mr. G. F. Bowman; Hon. Secretary—Mr. Robert P. Oglesby (12, East main Leeds); Members of Council—Messrs. Robinson, T. Marshall, F. Musto, H. A. Chapman, A. R. Hill, C. E. Reason (Assoc. Archt.); Past Presidents (members *ex officio*)—Messrs. J. W. Connon, Henry Perkin, W. H. Thorp, G. B. Bulmer, E. J. Dodgson, W. Carby and Butler Wilson.

Correspondence.

ARCHITECTS' DRAWINGS.

The paragraph in the *Builder* of May 6, commenting on the case of Gibbon v. The Council, ought to be convincing to all save those who are determined not to be convinced.

Architects are the right persons to hold possession of their own drawings and documents as between client and builder; the client has never in my experience disapproved of a course.

Drawings (for which we are not paid, not any vendors of pictures) made by our own hands on our own paper, in our own chambers, on our own time, with our own materials and instruments, and, lastly, with our own brains, and not our own, to whom with any better claim do they belong? As well might we then the tools of the carpenter, they having been employed in the performance of our work, truly because we have paid for such work, if it is our misfortune, not our fault, if, after approval, our designs are abandoned by our clients, but surely this cannot justify their right to be able to duplicate them elsewhere to the detriment of our art, to say nothing of pocket, and then have the assurance to lay the blame of such travesty, if any, at our door! Such injustice cannot sleep; time, if nothing else, must and will rectify it.

I venture to think that if this question had come through the "working man" (i.e., one not paid to think), the good old rule, *audi alteram partem*, might at the very least have brought about a patient hearing. I don't think it can be said with truth that we are as a profession unreasonable or unduly grasping—judging by the very many kind letters I have received during close on forty years' practice from those who began as clients and ended as friends, this has not been the case with myself. To sum up, it is, I think, a few cantankerous persons who have brought this scourge to the profession, and nothing is wanted on our part but a strong pull, a strong pull, and a pull all round, to rectify it. This should be easy, and the respect is what it ought to be. It is the selfless science of our law, that codeless spirit of precedent, that wilderness of single instances that wants looking into. If the spirit of music and the drama is held to be sacred, surely architects and sculptors should have their creations and rights respected.

E. SWINEN HARRIS, F.R.I.B.A.

COUNCIL ELECTION R.I.B.A.

In the circular issued by Mr. George Robinson, R.A., Mr. J. Macvicar Anderson, Mr. William Emerson, and Sir Aston Webb,

R.A., all Past Presidents of the Institute, occur these words:—"It appears to us of the greatest importance that the members of its Council should be representative architects of the highest standing, whose names are well known to the profession and the public; for without the experience and assistance of such men we are convinced the work of the Institute cannot prosper or confidence in it be maintained." And they "urge the importance of selecting only the most representative men as members of its Council, in whom all can have confidence while this important question (compulsory registration of architects) is being considered. If this is not done," they add, "we are convinced a very serious crisis will arise in the affairs of the Institute which will paralyse, if it does not wreck, its usefulness and thus defeat the object we all have in view—i.e., the advancement and the highest interests of the art of architecture."

These are weighty words, and it behoves all members to weigh them well if they seek to advance the highest aims of the Institute, to record their votes in accordance with the advice given, and to refuse their support to those candidates whose avowed aim is to force through the compulsory registration of architects under Parliamentary powers.

I have voted in every election since I was elected a Fellow, and have sometimes been surprised at seeing the names of those nominated and elected, but never have I been more surprised than in the personnel of the present Council. When the list came out it appeared to me, and to many I venture to think, as a veritable *débâcle*, when men by no means "representative architects of the highest standing" occupied the seats of many who were.

To those entitled to vote and who have not yet done so, not knowing among the extensive list of candidates this year against whom to place a X, I would suggest that the circular issued by Mr. W. Gillbee Scott offers some valuable hints.

COLLIE A. ADAMS.

STR.—Is not the recent canvassing for election on the Council a little undignified for a "Royal Institute"? The four circular letters received by me appear to be about equally objectionable. Whilst standing for election on the Council, it is surely not necessary to take up a "ticket" as in a trades union society. To "register or not to register" is doubtless an important question—in fact, much too important to be settled by the members of any one particular council. Whilst cordially agreeing with the "principle of registration," I feel strongly that the Council should be composed of men of catholic opinions, and who have the general interests of the Institute at heart, rather than this one particular subject to the exclusion of all others.

F.R.I.B.A.

THE R.I.B.A. AND REGISTRATION.

STR.—The short article on this subject in your issue of the 6th inst. has scarcely done justice to the judgment of those who advocate the statutory enrolment of qualified architects.

My reply would be briefly as follows:—

1. Architecture is an art, but essentially differentiated from painting and sculpture by being based upon utilitarian wants requiring much technical knowledge, and this difference is, in the interests of the public, sufficient to justify the exclusion of untrained persons from the use of the title "architect."

2. That registration would indirectly benefit the profession does not invalidate the principle of the movement.

3. The fact of the Institution of Civil Engineers comprising practically all qualified men, and at the same time excluding from membership all but highly-trained candidates, is so far from being an argument against us, strongly in our favour. This profession is as varied in character and function as our own, yet the compulsory and exclusive system is applied with excellent results. I would add that a recent and rapid conversion to this protective policy warrants an expectation that the Institution would not hesitate to promote legislation if the profession of civil engineers showed an incapacity for cohesion such as architects have always exhibited.

4. I venture to think, moreover, that you overlook the two great facts which underlie our confidence in the success of this movement, namely:—

(a) That it is merely making compulsory a course of training which the new and

powerful Education Board of the Institute has drawn up and declared to be essential for all architectural students, and

(b) That the Institute examinations, which in future will doubtless be founded on the recommendations of the Board of Education, are compulsory, and that we only wish to extend the benefits of this principle to the entire profession.

No members of the Institute who have not openly condemned its system of compulsory examinations can consistently oppose a measure which was clearly foreseen and provided for in two clauses of its charter.

W. H. SETH-SMITH.

STR.—In reply to your note in your last issue upon Mr. Middleton's letter, the view he takes as to the education value of registration is not, as you suppose, a new one, but is one which has been advocated in this district for many years, and was an argument used by several of the representatives of the allied societies at the first meeting of the Registration Committee.

We fail to see how the scheme of the Board of Architectural Education is to be applied to more than a fortunate few of the young men entering the profession unless there be compulsion under registration, when it will be applied to the whole of them, and greatly elevate the profession.

The medical profession are thoroughly prepared for the work, but we know that this was not generally so before their Act was passed.

EDWARD M. GIBBS.

Sheffield, May 10

. No doubt; but medicine is a science, not an art.—ED.

R.I.B.A. STUDENTS.

STR.—In the Report of the Committee of the R.I.B.A. recently published is an expression of regret that so large a number of students remain on the list without proceeding to the Final examination. As one of these students who passed the Intermediate examination longer ago than the four years suggested in the conditions of the examinations, I may be able to give a few of the reasons for this state of things, and also, possibly, a suggestion for obviating it in the future.

I notice that, according to the Calendar of the R.I.B.A., not one of the Associate members of the Council has passed the Intermediate examination, and, so far as I can ascertain, only one of the other members has passed any qualifying examination for membership, and that, therefore, the Council is not in a position to realise the amount of labour involved in preparing for an examination while the candidate is, at the same time, working seven or more hours a day at the desk. Those who have passed through the classes and studio, particularly the studio, of the A.A., know that the one idea of the majority of the students is to work for the R.I.B.A. examinations, with the result that any subject not directly connected with those examinations is put off for future leisure, and, in the large majority of cases, postponed for ever. I presume that the majority of those who pass the Intermediate examination do so within their first five years' connexion with the profession, during which time they have worked for the greater part of their leisure studying the theory of construction and the history of architecture to the extent required by that examination; and, at the end of that time, for various causes—the feeling that they have deserved a rest for a year or two, or (with the more fortunate) a budding practice or a continental tour—they have neglected to continue the studies which directly prepare for the Final examination until the time arrives when they commence independent practice. Henceforward the necessity of earning a living, and the very meagre return for hard work during the first years of practice—work which probably consists in most cases of competition drawings for themselves, sketches for possible clients, perspective and working drawings for older architects, and from which return office expenses have to be deducted—leave the candidate very little time or enthusiasm for the preparation of the large number of testimonies of study required, quite apart from the studious portion of the preparation.

I therefore venture to suggest to the Board of Examiners that there should be but one examination after the very necessary Preliminary, and that there should be fewer testimonies of study required than now for the Intermediate and Final examinations taken together, while the papers should also be a combination of those set at both these examinations, thus superseding the present Special Final examination, for which but few testimonies of study are required. This would leave candidates more

time to compete for the prizes and studentships offered by the R.I.B.A. and R.A., for many of which age limits are fixed. Many of those who have won those prizes have not passed the examinations, possibly for the reasons above mentioned.

STUDENT R.I.B.A.

ON SOME EFFECTS OF ARTIFICIAL HEATING.

SIR,—I beg leave to address you upon a question of some importance to those concerned with the design or the management of public institutions, in particular—although it, in fact, has a far wider bearing—in respect to the effect upon the human body of modern means of heating, depending, broadly speaking, upon the conveyance of heat by radiation and convection respectively, for upon either one or the other, or a combination of both, all such means must obviously depend. The question of open fireplaces versus heating by hot water or steam, etc., is an old one, but I venture to suggest that it is generally looked at more in respect of fuel consumption, convenience, and first cost than from an actually scientific standpoint, having in view the essentially different physical effects of the two methods. I have not the presumption, in making the following remarks, to attempt to instruct the many readers of your valuable paper upon points of science, and I, therefore, offer them more in the manner of suggestions for comment than as actual statements of fact, and it is necessary, in so doing, for the purpose of clear explanation, I think, to start with a reminder of two elementary truths with which most educated people are familiar.

viz.—“Radiant heat, falling upon the surfaces of any body in the vicinity of that from which they emanate, is, according to the nature of those bodies, absorbed in them, or transmitted through them, or may again be reflected from them.”

Convection, in the transmission of heat, is the “picking-up,” or the transmission to air or water or other fluids or gases, of heat when the same are passing over the surfaces of heated bodies, such as when air passes over a radiator, or water over the tubes of a condenser.

Everyone has experienced, in a cold room with a fire in it, when standing in front of the fire, the sensation of being warm on the side facing the fire and chilly on the other, the reason, of course, being that the heat rays strike upon the body in a line with them, and are absorbed, so raising the temperature of that part, while those not impinging upon the body pass through the air practically without warming it, unless it is very moist, until they are received upon the walls and furniture of the room in varying degree depending upon the distance.

In artificial heating, by hot water, for example, radiant heat, so far as practical value goes, is absent, the heat being imparted to the air by the process of convection alone, as shown by the fact that a sheet of dry paper might be placed within a few inches of a hot-water or steam radiator for hours without being scorched, although the air in the room might speedily become warmed to an unbearable extent. Now, if the valves controlling a hot-water radiator were closed, the radiator would, of course, cool down to the temperature of the surrounding air, beyond which degree it obviously could not fall, for if the radiator were cooler than the air the process would be reversed, i.e., the “radiator” would take heat from the air. The term “radiator” is, therefore, really a misnomer, as has often been remarked, but the human body, in the sense in which the term is generally used, is itself a “radiator,” and owing to this cause, in cold climates where the truly radiant heat received from the sun is slight, the natives support the heat necessary to be maintained in their bodies by, to a large extent, a diet imparting heat. For example, in such cases a flesh diet is more needed than in hot sunny climates, and is instanced by a comparison between food consumed by the Esquimaux and the natives of India.

Now it is impossible, for obvious reasons of comfort, practically to heat by convection to a temperature at which the human body will not part with heat to the surrounding air, for to do that we should have to keep our rooms near 98 deg. Fahr. What, then, must be the effect upon persons living for long periods in rooms heated upon this method of convection alone?

I suggest that it must at length result in a sensation of chilliness, although the room to a person who has not been in it for a considerable length of time, limited, however, generally to hours (this time depending upon the state of health and constitution), may seem to be at a comfortable temperature. I fail to see how it could be otherwise unless under a diet

which would not appeal to the modern Englishman, not to mention the necessity for exercise not usually obtainable by nurses or patients in hospitals or asylums.

I have myself experienced this inherent and unavoidable defect of heating systems depending upon heat imparted to the air only, and I have made these observations with the intention of suggesting that it is necessary in choosing a heating system for hospitals, etc., to remember that radiant heat must be resorted to in conjunction with heat by convection process if comfortable and healthy results are to be achieved.

It is, of course, quite feasible to heat churches or chapels and meeting halls, or even offices, quite satisfactorily by convection systems; for as a rule, these are not tenanted by any one person for a sufficient length of time for the phenomenon I have described to be noticed, except in a few individual cases in which poor health is generally the explanation of the effect being felt sooner than usual.

I, therefore, submit that it would be well if public authorities, and others, would bear in mind that open fireplaces, although deemed by some “old-fashioned,” are not merely ornaments to please the eyes of hospital patients, etc., but are actual necessities.

I may add that (to use the stock phrase) “I hold no brief” for any system in particular, but I believe in making proper use of all—in fact, my training would lead me principally in the direction of the convection methods.

T. J. CODD, A.M.I.M.E.

MAPLE FLOORING.

SIR.—The statement by “Builder’s Assistant” that maple is the best wearing of the hardwoods, is quite incorrect. Some oak and most of the teaks, to say nothing of several other kinds of hardwoods, are much more reliable for their wearing qualities.

He is quite correct as to the treacherous nature of maple, and we quite agree that the precautions he suggests are very advisable.

DAMMAN & CO.

ARCHITECTURAL DRAUGHTSMEN IN CANADA.

SIR.—Could you or any of your readers give me any idea of the chance a draughtsman would have of obtaining work in Canada?

I understand that in San Francisco one can get work at a good salary, and live inexpensively, but I should much prefer Canada, if there is a good chance of obtaining employment there.

Perhaps some of your readers may be able to help me or to tell me where to go for information.

R. B. C.

COMPETITIONS.

NEW SCHOOL AT TAUNTON.—The official statement of the result of this competition, sent to us last week for publication, omitted the name of the assessor, Mr. Charles Hadfield, of Sheffield.

KING’S COLLEGE HOSPITAL.—The King’s College Hospital Removal Committee, following the advice of their assessor, Mr. Rowland Plumb, have awarded the first place to the design sent in by Mr. W. A. Pite, F.R.I.B.A., of the firm of Messrs. Pite & Balfour. The Committee have also appointed Mr. Pite to act as the architect of the new hospital buildings.

HOSPITAL, ALTRINGHAM, CHESHIRE.—The District Council have accepted the plans of Mr. Wm. Owen, Duchy Chambers, Clarence-street, Manchester, for the erection of a hospital for infectious diseases. The designs were submitted in a limited competition, and were awarded the first place by the assessor, Mr. Frank Briggs, F.R.I.B.A., Liverpool.

BOOKS RECEIVED.

THE COUNTRY GENTLEMAN’S ESTATE BOOK. 1905. Edited by W. Broomhall. (The Country Gentleman’s Association.)

GAS ENGINES AND PRODUCER GAS-PLANTS. By R. E. Mathot; translated from the French. (Crosby Lockwood & Son.)

INDUSTRIEL ARDOISIER: CARRIÈRES ET MINES. Par G. Lavière. (C. H. Broodbank: London.)

DECIMAL COINAGE AND THE METRIC SYSTEM. By Edwin Anthony, M.A. Second Edition. (G. Routledge & Sons. 2s. 6d.)

A GRAMMAR OF GREEK ART. By Percy Gardner, Litt.D. (Macmillan & Co. 7s. 6d.)

THE DESIGN OF BEAMS, GIRDERS, AND COLUMNS. By W. H. Atherton, M.Sc. (Chas. Griffin & Co.)

COURT OF COMMON COUNCIL.

THE Court of Common Council re-assembled after the Easter vacation on Thursday last week, the Lord Mayor presiding.

Street Improvements.—The Improvement and Finance Committee submitted a report dealing with a number of proposed street improvements, among them being a proposal to acquire so much of No. 85, Knightbridge-street as was required for the widening of Friday-street for the sum of 2,000. The proposal was agreed to.

Lighting of Streets.—On the recommendation of the Streets Committee it was agreed to adopt a scheme for lighting Queen Victoria-street, a portion of Queen-street, Fleet-street, and a portion of Upper Thames-street with high-pressure gas lamps in lieu of the existing electric arc lamps. It is stated that the Committee have recently been carrying out photometrical tests of the comparative illuminating powers of electric and gas lamps in the City.

Paving Works.—The Streets Committee further recommended that the contract with the Val de Travers Asphalt Company for maintaining the carriageways of Moorgate-street and Finsbury-pavement be extended for one year at the rate of 1s. 6d. per sq. yd. super, an increase of 6d. per sq. yd. super at the present price. The recommendation was agreed to.

Having transacted other business, the Court adjourned.

Illustrations.

STAIRCASE, MUNICIPAL BUILDINGS, WALSALE.



THESE buildings were commenced about three years ago, and are now completed, the opening being fixed for September next.

The view shown is that of the principal staircase, the door in front giving access to the ante-room of the council chamber, the return flights of the staircase being carried up to give access to the committee-rooms.

The decorative part of the design has been executed in Bath stone, the walls finished in plaster and painted; the floors are all veined, Sicilian marble, and the ceilings in fibrous plaster, by Mr. Gilbert Seal.

There are two finely designed stained glass windows lighting the staircase at this level, these being the work of Mr. A. Garth Jones, and executed by Messrs. Abbott & Co. of Lancaster.

The general contractors were Messrs. Armistage & Hodgson, of Leeds, and Mr. W. C. Low acted as clerk of works.

JAMES S. GIBSON.

DESIGN FOR A HOUSE.

THIS is a design for a house based on the American “colonial” style. It was proposed that the walls should be of brick, “rough-cast,” the quoins of stone, the cornice and columns of wood painted white, the louver shutters being painted bright green. The roof would be covered with green slates, the flat of lead surrounded by a wooden balustrade. It was proposed that internally all the woodwork should be painted white.

R. A. BRADSHAW.

“FRAMEWOOD”: THE ENTRANCE FRONT.

A view of the garden front of this house was published in our issue of June 18, 1904, with a plan and a brief description. We now give a view of the entrance front.

Mr. Gerald C. Horsley is the architect.

HOUSE AT ENFIELD.

In this tile-hung house, Hart & Waterhouse, now in course of execution, an attempt has been made to preserve a quiet, dignified character, which is so often seen in old farmhouses; and when the roughcast weathered and the colour of the roughcast brought into harmony, as it is sure to be by time, a pleasing contrasted effect will result. The chief rooms face south, and the ground slopes away gently, so that good views are obtained. A broad terrace runs along the back of the house, and it is proposed to form a shelter from the wind at both ends.

The interior is being well finished with panelings, and wooden columns, and there is some interesting glass.

Messrs. Akers & Co., of Norwood, are the builders. The drawing is exhibited at the Royal Academy.

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE-STEEL.—XIX.

TRANSIT SHEDS: MANCHESTER SHIP CANAL.

It rapidly has traffic increased on the Manchester Ship Canal that continual additions have been necessary to the accommodation originally provided at the inland terminal. For some years past the old docks have been inconveniently crowded and the warehouse capacity has been overtaxed. Hence, two or three years ago it became absolutely essential to provide additional quay space for vessels and facilities for dealing with merchandise brought into and out from the port.

The works then decided upon included the construction of new docks and quays, the erection of extensive ranges of buildings for use as transit sheds, and the laying-out of railways, sidings, and roads. The site secured was formerly occupied by the Manchester Ship Canal Company, and covers an area of some 150 acres. About 21½ acres of this will be devoted to the new docks, and the remaining portion to the quays and the other necessary works.

The first dock, officially known as Dock No. 9, with an area of 15½ acres, has already been completed; while the other, Dock No. 10, which will have an area of 6 acres, remains to be built.

In the present article we have to deal only with the series of five transit sheds built in connection with Dock No. 9. These sheds, having a frontage of about 2,250 ft., extend across from end to end of the quay along the north side of the new dock, and have a uniform width of 110 ft.

In view of the disastrous fires which have occurred in various ports where combustible cargoes existed, the directors of the Manchester Ship Canal wisely determined that the new building should embody the most perfect system of fire-resisting construction. Concrete-steel is a material admirably compatible with the required conditions, and one that has already been applied on an extensive scale to the building of warehouses on the Thames, at Southampton, and at other British ports.

The new sheds at the Manchester docks are entirely of concrete-steel on the Henneberg system, the general designs having been prepared by Mr. W. H. Hunter, M.Inst.C.E., Chief Engineer to the Manchester Ship Canal, and the details of construction by Mr. L. G. Uebel, representing the patentee in this country. The building contractors were Messrs. Lovatt & Brudeur, of Wolverhampton.

The middle shed is 450 ft. long, and the other two are 455 ft. long each, the whole series being created by gangways or bridges joining the upper floors and the roofs of adjacent sheds. Fig. 129 is a half-elevation of one of the 425-ft. sheds. This drawing shows the main front facing the railway sidings, the main front on the opposite side facing the other dock. Although known as sheds, it will be seen that the buildings are of more important character than is suggested by the designation applied to them. Each shed comprises three floors, and a flat roof, virtually constituting the fourth floor. The height from the ground level to the under side of the main beams of the first floor is 14 ft. 3 in., the height of the first story is 8 ft. 4 in., and that of the second story is 11 ft. 7 in. These measurements are taken in all cases to the under side of the floor beams. The height of the sheds from ground level to the roof is 45 ft., and to the ridges of the towers is 71 ft. 3 in. All the roofs are flat, so as to be available for the storage of packing-cases, and merchandise not liable to injury by rain, and the collective floor area provided for the storage of five sheds being about 950,000 sq. ft., or nearly 22 acres.

The floors of the first story are prolonged to form a balcony 12 ft. wide along the south side of each building, except where interrupted by the towers, of which two are shown in Figs. 129 and 130. Another balcony, with a width of 4 ft., runs along the north front. These balconies are indicated in broken lines in Fig. 130, which is a half-plan of one 425-ft. shed. The two towers in Fig. 129 are used for hoisting purposes, and the two turrets are small buildings on the roof, situated above the stairs shown in Fig. 130.

Construction was commenced in July, 1903, and finished early this year, about six months

in advance of the contract time, the total cost of the sheds, exclusive of fittings and equipment, amounting to more than 150,000l. The quantity of concrete used on the sheds alone exceeded 26,000 cubic yds., and over 5,000 tons of steel were employed as reinforcement. The number of workmen employed varied from 350 to 400, and of this number about twenty, including foremen carpenters and cementers, were of French nationality.

Sand and gravel for concrete-making were provided by material excavated during the construction of the new dock, and special plant was laid down for washing, sorting, and crushing the materials. The moulds for the concrete necessitated the employment of more than 141,000 cubic ft. of timber.

For the purpose of facilitating the erection of the superstructure, a track was laid along the whole length of the sheds, front and back, upon which a travelling stage was placed and moved from point to point, as required. This stage was equipped with two concrete mixers of the Oehler type, each capable of making 40 cubic yds. of concrete in ten hours.

A small portable crane, running upon a transverse set of rails, was used to charge the concrete mixers. A large crane, travelling upon the main track, was employed for hoisting concrete and steel to the various floors and roof of the sheds. This crane had a jib with a radius of 23 ft., and was capable of raising a load of 1½ tons to a height of 50 ft.

The general method of construction being the same for each of the five sheds, it is only necessary to describe in detail a typical section of one shed.

The foundations are provided by ninety-three concrete piers 6 ft. wide and 16 ft. deep, spaced 25 ft. apart centre to centre. These foundations are really extensions of the piers supporting the arched construction of the quay wall, each of them having a total length of 149 ft.—37 ft. being beneath the quay and 112 ft. between the front and back boundaries of the new sheds. Below the south front of the sheds the ends of the piers are connected by concrete arches 3 ft. thick, which were built without much excavation, as the earth was merely cut to the curve selected for the intrados of the arch, and, after being carefully dressed, was covered by concrete deposited upon it between timber shutters. By the adoption of this plan, the expense of excavation and refilling was entirely avoided, as well as that of erecting and removing moulds. Moreover, the arches receive valuable assistance from the solid earth, which has far greater bearing power than material repacked into an excavation.

Owing to the low level of the concrete piers, it was necessary to build brick footings (see Fig. 131) for the support of the column bases. These footings, about 7 ft. 9 in. square by 4 ft. high, are spaced 22 ft. apart, so that there are six of them along each of the concrete piers, which, as mentioned above, are spaced 25 ft. apart. Thus, as shown by Fig. 130, there are eighty-five main columns in each of the four 425-ft. by 110-ft. sheds. In the 450-ft. by 110-ft. shed there are ninety-five main columns. Upon the brick piers are fixed cast-iron base-plates 4 ft. in diameter by 9 in. high, the top of each being level with the surface of the ground floor. The bases afford bearing for the steel bars forming the vertical reinforcement of the columns, and over them are placed dome-shaped shields of cast-iron. These, being filled with concrete, serve to hold the columns rigidly at the base, and at the same time to protect them from accidental injury.

The reinforcement of the columns consists of vertical bars connected, at intervals of about 6 in. apart, by ⅝-in. diameter steel ties. The vertical bars are of 1½ in. diameter and 16 ft. 6 in. long, so as to extend from the base-plate to about 2 ft. above the first floor, where they are connected with the vertical reinforcement of the section above. Steel angle bars are also provided outside the corner of every column for the purpose of shielding the concrete from injury in the course of daily work in the sheds. These angles measure 4 in. by 4 in. by ½ in., and extend from the floor almost to the ceiling of each story. They are attached to the columns by 6-in. strips of hoop iron riveted to them at intervals, the ends of the strips being split for a length of about 2 in. and opened in opposite directions so as to afford a secure bond.

When all the reinforcement and the angle plates had been erected and temporarily secured in position, the cast-iron bases and

dome-shaped shields were filled in with concrete, which was well rammed. The column moulds were then erected and shored up. One side of each mould was left open, as illustrated in Fig. 10 ante. The concrete was deposited in layers 6 in. thick, boards being fixed one at a time across the open side of the mould as each layer of concrete was finished. The concrete was mixed fairly wet, so as to make it easy to fill all spaces in the moulds, and it was rammed down until water rose to the surface, the ramming being performed by iron bars with a right-angled bend of 3 in. long at the end.

All the columns were built in a similar manner, but the details of construction necessarily varied in accordance with the loads to be carried. Fig. 132 contains cross-sections of typical columns on the various floors of the sheds. Commencing at 20 in. square with ten vertical bars on the ground floor, the columns were reduced to 14 in. square with nine vertical bars on the first floor and to 10 in. by 12 in. with four vertical bars on the second floor, while other columns supporting structures on the roof measured 64 in. by 12 in. The columns on the ground floor were calculated for a normal load of 340 tons each, those on the first floor for a load of 226 tons each, and those on the second floor for a load of 113 tons each. These loads represent pressures of about 1,950 lb., 2,520 lb., and 2,100 lb. per sq. in. respectively for the three portions of each column, or an average of about 2,200 lb. per sq. in. of cross-sectional area.

To afford additional support for the main beams, the tops of the columns were extended to form a bracket on either side with a projection of 18 in. and a depth of 10 in. close to the column. The reinforcement of these brackets consists of two ¾-in. diameter bars passing horizontally through the column, rising up at each end parallel to the under surface of the bracket and continuing into the concrete of the beams above.

After the columns had been built up to the first floor level and left to harden for about a week, the main and secondary beams were formed in timber moulds extending from column to column. The main beams, 12 in. wide by 18 in. deep, extend from end to end of each shed, tying the tops of the columns together and really constituting continuous girders.

The secondary beams, or joists, reach from column transversely across the building, forming panels 25 ft. by 22 ft., each of these rectangles being subdivided by three intermediate joists, supported at the ends by the main floor beams (see Fig. 130).

The reinforcement in each of the main beams comprises nine longitudinal bars in rows of three abreast and numerous stirrups, also three abreast, placed 6 in. apart along the beam. Half of the stirrups pass under the lowest bars and half over the uppermost bars. Fig. 133 contains two sections of a typical main beam, one taken near the supports and the other at the centre.

When the beam moulds had been erected and securely stayed the spaces between them were filled by timber panels laid level with the upper edge of the beam moulds, and the whole surface was coated with a layer of linewash before the commencement of concreting.

The first step in this operation was to spread a thin layer of concrete 1 in. thick along the bottom of the beam mould, and, after well ramming, to place the lower set of stirrups in position. These stirrups consist of twelve S.W.G. steel strip 2½ in. wide by 43 in. long, and when bent into U-form, the effective length was about 20 in., permitting the two ends of each stirrup to project about 3 in. through the top of the beam, the projecting ends being afterwards incorporated in the concrete of the floor slab.

The stirrups, three abreast in the width of the beam, were spaced 6 in. apart longitudinally, and inside them were laid three bars of the longitudinal reinforcement, the diameter of these bars being 1½ in. Next came a layer of concrete sufficient to cover the bars, and over this were laid three 1½-in. bars, bent up towards the ends, so as to provide suitably for resisting tensile stress developed in the upper part of the beam section, between the supports and the points of contrary flexure. More concrete was then deposited, entirely covering the bent bars, and three 1½-in. diameter bars were laid over it. The upper stirrups were next adjusted over the top bars and pushed down into the wet concrete, these stirrups being made of 13 S.W.G. steel strip 1½ in. wide. The total length of metal

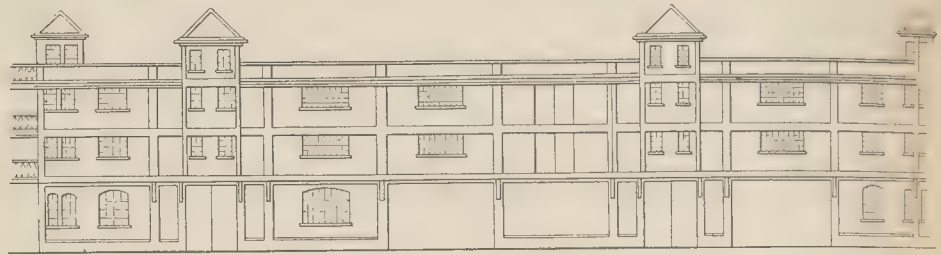


FIG. 129.

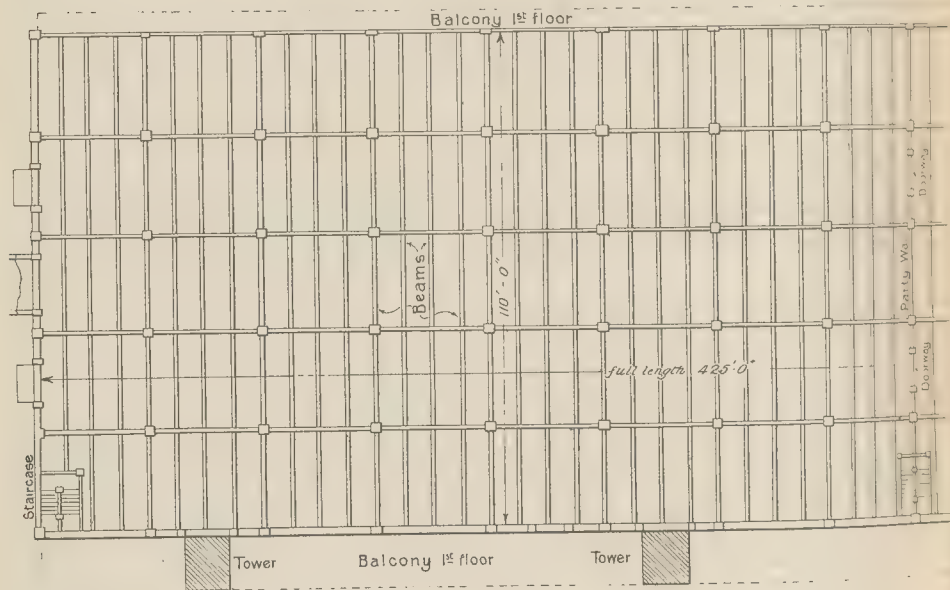


FIG. 130.

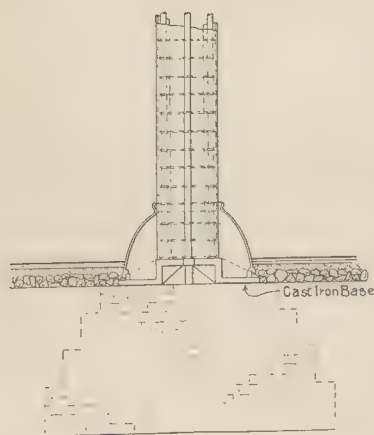


FIG. 131.



FIG. 132.

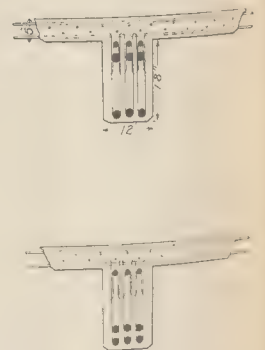


FIG. 133.

each stirrup was 19 in., giving an effective depth of about 8 in. The mould was finally filled up with concrete, and a period of four or five days was allowed for hardening before the removal of the floor slab.

A very similar course of procedure was followed in the construction of the secondary beams, which contain six bars of longitudinal reinforcement, four bars of 1½ in. diameter near the bottom of the concrete, and two bars of ½ in. diameter near the top.

The ends of all the bars and stirrups were bent out, so as to afford secure anchorage, and the round bars were jointed together at the corners where they overlapped. The extent of the overlap varied from about 12 in. to as much as 18 in., according to the strain coming upon the construction.

GENERAL BUILDING NEWS.

JOHN'S PRESBYTERIAN CHURCH, RUNCORN.—The church has been erected upon a site near the Victoria-road and is connected with existing school buildings which face York-street. Entrances being provided from both sides. Accommodation is provided for about 300 on the ground floor, and sixty pupils over entrances. A cloakroom is situated near the main entrances, and a vestry minister's use at the chancel end of the church. The pews are so arranged as to rise towards the rear, and radiate towards pulpit in such that everyone may see and hear without difficulty. The whole of the walls rest upon concrete foundations, and the floors are of concrete laid on concrete so that there may be no chance of dry rot or subsidence. The design is late Gothic in character, and a tower and spire to the right of main entrance. The buildings facing Victoria-road are of Runcorn stone, and all the windows are filled with cathedral leadlights. The interior work will be of pitch-pine, varnished. The contract, amounting to 3,500l., has been let out by Messrs. George Parker & Co., 15, Hill; the joiners' work by Messrs. J. Hill & Son, of Liverpool; from the design under the superintendence of Mr. T. W. Wainwright, architect, of Birkenhead; Mr. Robert Jones acting as clerk of works.

ST. JOHN'S CHURCH, EXETER.—The new parish church, erected in St. Sidwell's, was opened on the 3rd inst. Messrs. G. W. G. and W. H. Coles were the architects.

ST. JOHN'S CHURCH, CHORLEY.—The foundation-stones have just been laid of a new parish church in Eaves-lane, Chorley. The building will have sitting accommodation for 400, or a mixed congregation of 400. The estimated cost is 2,500l. Mr. L. W. H. Dinsley, Chorley, the architect. **RENOVATION OF TOWER OF COLIN ST. DENY'S CHURCH.**—Under the auspices of the Society for the Preservation of Ancient Buildings, a scheme of renovation entailing an expenditure of 1,000l. has been carried out at this church. The work has been executed under the direction of the architect, Mr. William H. Abington, Berks, and there has been a contractor, but workmen living in the village and neighbourhood were employed.

ST. JOHN'S CHURCH, EXETER.—The foundation-stones of a new parish church have just been laid in Exeter, near Kingsbridge. The new church will provide accommodation for 400 children. The architects are Messrs. J. W. G. and W. H. Coles, Newton Abbot.

THE LIBRARY AT CRICCIETH, NORTH WALES.—The new library at Criccieth was recently opened by Mr. John E. Greaves, Lord-Lieutenant of Carnarvonshire. The principal books are arranged on two floors. The ground floor of the building is of red Ruabon brick, and the upper part is of red Ruabon stone dressings, the upper part finished with rough-cast, with ornamental projecting courses. The principal entrance is placed in the centre of the main front and opens directly into a hall, on the left of which is the general reading-room, and on the right and also opening out of the central hall is the lending library. There is also a reading-room, in the rear of which are the offices of the central hall is the staircase with retiring-rooms, etc. On the first floor is the reference library, the committee-room and the store-room. Mr. David Evans, the contractor, carried out the whole of the work on the designs of Mr. Rowland Lloyd Jones, the County Architect of Carnarvonshire.

ST. JOHN'S BANK PREMISES, DUNDÉE.—The new bank is now complete. The bank is situated at the Hilltown corner of the Victoria-road, the entrance being at this corner. It is built of red stone from Dundee, and is Elizabethan in character, with a central feature of a large window, the central feature

being a round tower, with conical-slatted roof, flanked by two ornamental gables. The building throughout is heated with hot water as well as by coal fires, and is fitted with electric light. The architects are Messrs. Johnston & Baxter, and the following are the contractors, under the superintendence of Mr. P. C. Barton:—Masons, A. & T. Craig; joiners, Charles Smith & Son; plumber, David Bremner; plasterer, James Laburn; painters, P. & A. Davis; slaters, Alexander & Thomson; carving, Alexander Neilson; heating, David Keay; wrought-iron work, Thomas Russell; strong-room, Chatwood's Patent Safe and Lock Company; electric installation, Lowdon Brothers.

GUARDIANS' OFFICES, BYKER.—The alterations to the relief station at the top of Byker Bank have now been completed. Mr. Arthur Stockwell was the architect, and Mr. R. Harbottle the builder.

PROPOSED BUILDINGS FOR THE ASTON GUARDIANS, BIRMINGHAM.—At a recent meeting of the Aston Board of Guardians, Mr. Doggett represented the minutes of a meeting of the Building Committee, remarking that they had considered the plans and estimates of the proposed new buildings. These included a new pavilion, half-pavilion, and places of worship for the Roman Catholics and Protestants. The estimates were:—New pavilion, 10,410l.; half pavilion, 3,550l.; Roman Catholic chapel, 200l.; Protestant chapel, 2,550l.; architect and clerk of works, 850l. and 200l.; quantity surveyor, 250l.; furniture, 1,000l.; contingencies, 500l.; a total of 19,500l. Mr. Doggett moved the adoption of the estimates, and also that the plans be forwarded to London. After discussion, the motion was carried.

RESTAURANT, NEWCASTLE.—In the basement of Emerson-buildings, at the corner of Blackett-street, Newcastle, a new restaurant has been opened. The designs for the various rooms were prepared by Messrs. Simpson, Lawson, & Mayne, architects, of Newcastle.

ENLARGEMENT OF CRIPPLES' HOME, BOURNEMOUTH.—The Victoria Home for Crippled Children in Burnaby-road, Bournemouth, is now being enlarged. The additions, which are to the south-west side of the house, are to consist of a room 24 ft. by 16 ft., with doors leading from the old playroom, a sick-room, nurses' room, bathroom, and sanitary accommodation. The new structure will have only the one floor, and the roof is to be flat and asphalted. The erection will be of Bridgewater bricks, with Ham Hill stone dressings. The architect is Mr. Warman, of London, and the builders are Messrs. J. McWilliam & Son, of Westbourne.

HOSPITAL EXTENSIONS, SCARBOROUGH.—A new wing, which has recently been added to the Scarborough Cottage Hospital in Springhill, Seamer-road, was opened on the 26th ult. The addition consists of a dining-hall, two wards which accommodate eight beds each, with lavatories and bathrooms attached. The total cost, including furnishing, is estimated at 1,000l. The work has been carried out according to the plans of Mr. J. Caleb Petch, architect, by the following contractors:—Brickwork, Messrs. Hunter & Smith; joinery work, Mr. J. W. Plaxton; plumbing, Mr. R. Gough; painting, Mr. A. Briggs; carpenter, Mr. H. Pickup; and slating, Mr. Hardgrave.

INFIRMARY, LEIGH.—The foundation-stone of the Leigh Infirmary was laid on the 29th ult. The contract for the new building has been let to Mr. J. Cocker, of Walkeon, for 13,500l. Mr. J. C. Prestwich, of Leigh, is the architect.

PRIMITIVE METHODIST MANSE, SHOTLEY BRIDGE.—On the 6th inst. the foundation-stones of a manse for the superintendent minister of the Shotley Bridge Primitive Methodist Circuit, to be erected on the new road on the Shotley Lodge estate, were laid. The building will cost about 800l., and has been designed by Mr. William Barron, architect; the contractors being Messrs. Wm. Ayton & Sons, of Benfield-side.

STAINED GLASS AND DECORATION.

MORNINGSIDE, EDINBURGH.—A large stained-glass memorial window of four lights has been placed in St. Matthew's Church, Morningside, Edinburgh. The subject of the memorial, which consists of two centre lights and the vesica, is the "Incarnation of Our Lord." In the vesica there is a figure of an angel proclaiming the text, "The word was made flesh and dwelt among us." In the south light the subject is "Christ Raising Lazarus," the third light represents "The Feeding of the Multitude," and the last "The Sending Forth of the Twelve." The window is from the studio of Messrs. Percy Bacon & Brothers.

MEMORIAL ORGAN, THURSTON.—An organ has been placed in Thurston parish church in memory of the late Mr. T. H. Ismay. The organ is of the instrument was designed by Mr. R. Norman Shaw, R.A., and the builders were Messrs. Henry Willis & Son.

SANITARY AND ENGINEERING NEWS.

WATERWORKS, ARBROATH.—New waterworks for Arbroath are being constructed. On the 2nd inst. another section of the contracts was started, and three separate contractors are now engaged in the operations. The section upon which work has now been commenced takes in the laying of the pipe track from the west end of the service reservoir at Colliston to the service reservoir at Framedrum, including the construction of the latter. The contract amounts to about 14,000l., and the contractors for the section are Messrs. M'Laughlin, Anderson, & Mann, Glasgow. Messrs. Crouch & Hogg, O.E., Glasgow, are the engineers of the scheme. Messrs. Gibson are making good progress with their section of the contract from Melgund to Easter Marous, and Messrs. Crawford have also accomplished a good part of the work between Easter Marous and the Gwynd. It is expected that work on the section between Colliston and Arbroath will be started next week. The contractor is Mr. John Bryce, Polmont, and this section of the work is estimated to cost about 11,000l.

PIER, FALMOUTH.—The new promenade pier at Falmouth was opened on the 5th inst. The total length of the pier is 310 ft., the portion nearest the town being of solid granite, with a superficial area of about 6,000 sq. ft. From that point the pier extends 200 ft., all being constructed of ferro-concrete work. It is supported by twenty-nine circular concrete pillars, finished on the top with capitals, with sunken ornamental discs, on which circular lamp-posts are fixed. The guard railings are of cast-iron, with ornamental castings, and seats are provided on the deck. Accommodation for landing is provided to the extent of four flights of steps in the ferro-concrete pier, and three flights of granite steps in the inner work. The width of the outer pier is 36 ft. The end of the pier is rounded, and provision has been made in the construction for a further extension if necessary. The deck is of solid concrete, and there is no timber about the construction. The level of the deck is from 4 ft. to 4 ft. 6 in. above high-water mark. The entrance to the pier proper has been widened by setting back the new King's Hotel at the right of the entrance, making the whole width about 55 ft. The engineers of the scheme were Messrs. L. G. Mouchell (the English representative of the Hennibique's patent ferro-concrete construction) and W. H. Tresidder, Borough Surveyor.

SEWAGE SCHEME, PIXHAM, DORSET.—Major C. E. Norton, R.E., on behalf of the Local Government Board, held an inquiry at the Dorking Council Chamber on the 27th ult. into the application of the Urban Council for sanction to borrow 1,500l. for sewerage works in Pixham-lane. Among those present were Mr. G. Strachan, engineer for the scheme, and Mr. G. S. Mathews, Surveyor. Mr. Strachan said that it was proposed to sewer a portion of Pixham, commencing at Hazelbourne and ending at the outfall works, which, owing to the engineering difficulties, was not included in the original scheme for draining Dorking. Mr. Strachan further said that his scheme was to raise the sewage by means of ejectors, and deal with it at the present outfall works.

EXTENSION OF THE PARADE, BRIDLINGTON.—The extensions, which are at present being made to the parade at Bridlington, are estimated to cost 21,000l., exclusive of certain buildings, which would include a concert-hall, and probably a café, the cost of which would be about 10,000l. The parade will be carried seaward 40 ft., and northward 212 ft. Mr. Ernest R. Mathews is the Borough Engineer.

PROPOSED DESTRUCTOR, BAYFORD, NOTTINGHAM.—A Local Government Board inquiry was held at the Guildhall, Nottingham, on the 3rd inst., by Colonel A. J. Hepper, D.S.O., R.E., Inspector, into an application by the City Council for sanction to borrow 23,500l. for the provision of a refuse destructor and health depot on land belonging to the Council, situated near Vernon-road, Bayford, 2½ miles from the purchase of property for the widening of Hockley, and 3,000l. for the erection of a dormitory at the city lunatic asylum. Mr. A. Brown, the City Engineer, put in plans. He said that there was no house within a radius of 100 yds. of the proposed site of the destructor, with the exception of one belonging to the Corporation, and there were only twenty houses within a radius of 200 yds., while these were on the north side of the railway embankment. The chimney would be 160 ft. high, and there was no land on a level with the top within a distance of two miles. Evidence was also given by Mr. Brodie, City Engineer, Liverpool; Mr. Wike, City Engineer, Sheffield; and Mr. Cox, City Engineer of Bradford.

NEW BRIDGE OVER THE MOLE.—The Urban District Councils of Esher with the Dittons and Walton-on-Thames are about to erect a new steel bridge over the River Mole at Lamas-lane, near Esher, in place of the old cast-iron

plaintiff said that he had received the bill for the defendant firm, but that he still owed him the amount he claimed. He certainly signed a contract agreeing to do so under certain conditions, but he did not acknowledge it in the one produced. He was under the impression that there were only a few lines on the document to which he affixed his signature, and that there was a blank space for his name.

The judge: I don't think you would have signed your name leaving a space blank.

Answer to the defendants' solicitor, plaintiff: I am sorry that he had had a "little trouble" with the London Zinc Workers' Society, and that in fact, been expelled from membership on account of sub-contracting for the work in question. It was against the rules of the society, he explained, for a member to sub-contract for work.

A member of the defendant firm said that, according to the plaintiff's contract, all three parties were to be completely under piece-work conditions. The amount now claimed was on a weekly, for daywork which had already been paid for. Plaintiff did not finish the work in accordance with his contract. The honour found for the defendants, and costs.

PATENTS OF THE WEEK

1201 of 1904.—W. H. BRAYNE and H. WALTON: *Boiler Heating Apparatus.*

A heating apparatus, wherein the heating liquid can be automatically circulated in a pulsating manner at predetermined intervals by causing steam generated in the boiler to act upon and force heating liquid from a displacement chamber either directly or through the boiler, into a delivery portion of the circulating conduit, whilst the portion of the conduit is shut off from the chamber and boiler, and as soon as a predetermined quantity of steam has accumulated in the said chamber and a corresponding volume of heating liquid has entered the delivery portion of the circulating conduit, causing the steam to enter a condenser and be exhausted, so that in consequence of the return water will flow into the boiler and displacement chamber whilst the delivery portion of the circulating conduit is shut off therefrom, these operations taking place in succession, so as to maintain sufficient pressure is maintained in the boiler.

1202 of 1904.—W. PRATT: *Window Fasteners.*

The window, constructed according to this invention, consists essentially of two curved members sliding on one another and pivoted together, on opposite sashes, in such manner that the only means of releasing same is turning the larger or inner member on a pivot in one direction. The first member, a sashener proper, is preferably pivoted on a pin fixed to the inner or lower sash, and provided with a knob at its one end, whilst the second member is adapted to enter a recess or groove formed by an overhanging flange of another sash fixed to the opposite sash. The second member or guard-piece pivoted on the outer sash also works side by side with the fastener in the same groove, and is locked therein by a fastener on the completion of the closing movement of the latter. It is a feature of this invention that the two sashes can be forced apart as to leave a small opening or air space between them, without permitting any rattling or rattling of the windows, this being effected by the adjustment of the length of the two sash members, or of the inner one only.

1203 of 1904.—W. PURKES: *Metal Casements.*

This invention relates to metal casements, characterised by a frame of channel or other metal section, an outer casement hinged or pivoted thereto, and an inner casement hinged to the outer casement, both casements being provided with flanges so arranged that the outer casement is free to open outwards, and the inner casement inwards, in such a manner that the whole when closed forms a double sash in the joints, in combination with means for fastening both casements together and of the frame.

1204 of 1904.—C. FAIRBANK: *Sash Frames.*

Inside linings and architraves of sash frames, according to this invention, are formed in one piece instead of the architraves being in the usual way.

1205 of 1904.—W. MANLEY: *Lavatory Basins, Baths, and the like.*

This invention relates to lavatory basins, baths, and the like, and has for its object to provide a lavatory basin, bath, or the like, in which these applications are in the stage in which attention to the grant of Patents upon them can be made.

a lavatory basin superposed upon a bath without taps or tap holes, but supplied with hot or cold water from a geyser, which can be fixed over the basin, the basin being provided with a connecting waste-pipe above the bath waste, which pipe is detachable when the bath is required, the bath being filled through the basin. In carrying the invention into effect a lavatory hand basin is provided superposed above the foot of the bath and mounted in a frame fitted upon the edge of the bath, and provided with a geyser advantageously fixed above the basin by which a supply of hot water may be admitted to the basin. A pipe is provided to connect the basin to the waste-pipe of the bath, which pipe is detachable. When the bath is to be used, this pipe is detached, and the plug replaced, the bath being filled through the basin.

1,273 of 1905.—O. SCHURICH: *Building Slab for Walls and Ceilings.*

A building slab of gypsum, cement, clay, or the like, for walls and ceilings, characterised in that the lateral faces of the slab are provided with longitudinal, dove-tailed shape middle and corner grooves and with transverse semi-circular grooves, which, when erecting the wall by joining each two slabs together, are filled up with a rapidly-hardening material such as moistened plaster of Paris, cement, or the like for the purpose of obtaining an intimate connexion between the slabs, and of preventing them from being displaced in the horizontal or vertical direction.

1,964 of 1905.—A. SIDEBOTTOM and RUDD & Co., Ltd.: *Chimney Cowl, Ventilators, or like Devices.*

A chimney cowl, ventilator, or like device, consisting of a tubular portion provided with a truncated, truncated conical or pyramidal portion at its upper end having an exit hole of less diameter than the main shaft of the ventilator, and a hood whose lower end is located a little distance above the outlet of the truncated conical or pyramidal portion, and having its external diameter smaller than that of the main shaft of the ventilator, whilst its internal diameter is larger than the exit hole in the main shaft.

2,163 of 1905.—G. HARRISON (Erste Schattauer Tonwarenfabrik-Aktion-Gesellschaft): *Device for use in the Manufacture of Ornamented or Figured Plates or Tiles of Cement, Clay, or like material.*

A colour-measuring and filling or charging device for use in the manufacture of ornamented or figured plates, or tiles of cement, clay, or the like, consisting, for each colour, of two plates enclosing a slide, which plates are provided with openings corresponding to the hollow spaces of the stencil to be filled, and of which openings those of the upper plate simultaneously forming measuring chambers for the colour which, after adjustment of the device relatively to the stencil, enclose in the press mould and the drawing out of the slide, falls into the corresponding hollow spaces of the stencil.

2,240 of 1905.—S. VON BROKOWSKI: *Apparatus for Outside Lath Blinds.*

A device for operating the swinging guiding frames of outside blinds, consisting of a rotatable rod which, at the lower end, is fixed to a suitable operating gear adapted to be manipulated in the room, and an eccentric upon the rod capable, when rotated, of effecting a displacement of the guide frame outward or inward, a stud on said rod which, when the frame is in a perpendicular or closed position, engages a slotted tongue fixed on to the frame and prevents the frame from being displaced from the outside, projections integral with said eccentric or cam adapted to operate and adjust the frame and to fix the blind in the desired position.

11,384 of 1904.—J. TITLEY: *Wood Blocks for Paving, and in the Machinery for Manufacturing the same.*

Wood blocks for paving, characterised by forming a block of a number of sections or parts which are built up and secured together by forming spike-holes in the sides of the opposite section or sections, inserting spikes in the holes of one side, and then clamping the parts together until a block is formed of the required size.

13,203 of 1904.—J. W. TAYLOR: *Fireplaces and Hearths used in Private Houses, Offices, Public Buildings, and the like.*

A fireplace and hearth, consisting of a recess in the hearth with a sloping front, a fire-grate arranged above such recess about level with the hearth, the fire-grate being in two halves so that each half may be turned up, and used in conjunction with or without duplicate ash-pans, a fireclay back and a slab of fireclay arranged to slope from its lower edge from the front of the fireplace to the back, a flue

arranged behind the sloping slab of fireclay, and a damper or spot door in front of the inclined slab of fireclay to facilitate the cleaning of the chimney.

14,292 of 1904.—H. MILLS: *Scaffolding for Use in Building, and similar operations.*

Scaffolding, consisting in two sets of standards or uprights arranged at the opposite ends of any space or surface to be operated upon, each of such standards being attached at bottom to suitable supporting legs or to a base, and having adjustably mounted thereon a frame or beam provided with means to receive one end of a supporting board placed preferably edgewise thereon, and on which is or are placed a cross board, or boards constituting a platform for workmen and their tools or materials.

PUBLISHER'S NOTICES.

Nat. Tel., 612, Gerrard. Telegrams, "The Builder, London."

THE INDEX (with TITLE-PAGE) for VOLUME LXXXVII (July to December, 1904) was given as a supplement with the issue for January 1st.

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SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.		
May 1.—By FISHER & MURCH.		
Sunbury, Middlesex.—4, Doran-villas, u.t. 92 yrs., g.r. 44, 10s., p.	2275	
By WILLIAM HOLLES.		
Finchley.—11, Grosvenor-rd., u.t. 95 yrs., g.r. 71, 10s., g.r. 45s.	460	
Brownlow-rd., "Fairford" and "The Retreat," l., y.r. 68s.	910	
By WILLIAM HUGHES.		
Bournemouth, Hants.—Branksome Wood-rd., "Fern Brake," and 1 acre, l., p.	2,975	
Surrey-rd., "The Holmes," l., y.r. 110s.	1,750	
Bishop's Waltham, Hants.—"Locks Farm," 254 a. 1 r. 3 p., l., y.r. 200s.	6,520	
Hampton, Dorset.—"Morley Cottage," and 7 acres, l., y.r. 26s.	650	
Enclosure of building land, 4 acres, l.	120	
By MAY & ROWDEN.		
Holborn.—12, Theobald's-rd., u.t. 84 yrs., g.r. 40s., g.r. 32s.	1,660	
Harrow, Middlesex.—Middle-rd., l.g.r. 74, reversion in 6 yrs.	420	
Crown-st., "Walker's Coffee House," l., g.r. 20s.	345	
By WILKINSON, SON, & WELCH (of Brighton).		
Brighton.—71, Beaconsfield-villas, l., p.	1,025	
7, West-st. (a.), l., y.r. 210s.	4,485	
Lindfield, Sussex.—High-st., "Pierpoint House," l., y.r. 90s.	1,450	
May 2.—By DEENHAM, TOWNSON & Co.		
Hayes, Middlesex.—1 and 2, Holly-villas, area 2 a. 1 r. 10 p., l., p.	1,820	
By FREDK. WARMAN.		
Caledonian-rd.—No. 557, u.t. 87 yrs., g.r. 71, g.r. 55s.	400	
Holloway.—38, 38, and 42, Sussex-rd., u.t. 47½ yrs., g.r. 164, y.r. 102s.	810	
Canonbury.—38, Grosvenor-rd., u.t. 44½ yrs., g.r. 81, 10s., g.r. 60s.	495	
Haggerston.—29, 31, and 33, Suffolk-rd., u.t. 40 yrs., g.r. 94, w.r. 117s.	690	
Walthamstow.—11 and 13, Glendon-rd., l., w.r. 42s. 18s.	335	

By WATERBURY & SONS.
Cherisey, Surrey.—"Dumpsey Ryot," 2 a. 3 r.
19 p. f. 5320

By MONTAGU HOLMES & SONS.
Flumstead, Kent.—Villars-rd., f.g. rents 57l.,
reversion in 10½, 15½, and 20½ yrs. 2,135

And-st., f.g. rents 122l., reversion in 10½ and
21½ yrs. 5,380

Robert-st., f.g. rents 61l., reversion in 10½
and 20½ yrs. 2,005

East-st., f.g. rents 35l. 15s., reversion in 10½
and 30½ yrs. 1,080

Elm-st., f.g. rents 20l. 10s., reversion in 20½
and 25½ yrs. 740

Station-rd., f.g. rents 14l., reversion in 20½
yrs. 585

Griffin-rd., f.g. rents 7l. 10s., reversion in
30½ yrs. 270

Orchard-rd., f.g. rents 9l. 4s., reversion in 10½
and 25½ yrs. 355

Walmer-rd., f.g. rents 46l., reversion in
20½ yrs. 1,760

Glyndon-st., f.g. rents 11l. 10s., reversion in
10½ and 20½ yrs. 475

Park-rd., f.g. rents 23l., reversion in 20½ yrs.
May 3.—By BAKER & CO.
New Malden, Surrey.—Kingsford-st., "Bramley
Lodge," u.t. 47 yrs., g.r. 20l., p. 800

By BRAD & SON.
Bayswater.—1, Richmond-rd. (s.), f., y.r. 80l.
By COLLIER & BOWDICH.
Camden Town.—Camden-rd., etc., f.g. rents
21l. 6s., u.t. 29½ yrs., g.r. nil 815

Lyons-st., etc., f.g. rents 20l., u.t. 20 yrs., g.r.
nil 380

By W. A. ELLIS.
Chelsea.—8, 10, and 12, Ovington-sq., u.t. 20
yrs., g.r. etc., 27l. 3s., y.r. 460l. 4,300

18 and 20, Ovington-sq., u.t. 20 yrs., g.r.
10l., y.r. 200l. 1,560

36 and 37, Carlyle-sq., u.t. 40 yrs., g.r. etc.,
18l. 18s., y.r. 105l. 1,840

40 and 41, Carlyle-sq., u.t. 30 yrs., g.r. etc.,
16l. 18s., y.r. 146l. 1,610

By FOSTER & CRANFIELD.
Hammersmith.—259, Goldhawk-rd., u.t. 50
yrs., g.r. 6l., y.r. 60l. 760

Putney.—71 and 73, Lower Richmond-rd., u.t.
48½ yrs., g.r. 13l. 10s., y.r. 72l. 530

By HOBSON, RICHARDS, & CO.
Stamford-hill.—Nos. 150 to 168 (even), f.g.
rents 138l., reversion in 65 yrs. 2,900

Nos. 172, 174, and 176, f.g. rents 62l., reversion
in 65 yrs. 1,190

No. 148, f.g. 40l. 12s., reversion in 65 yrs.
Barnesdale-rd., f.g. rents 460l., reversion in
65 yrs. 1,110

By HOBSON & FLETCHER.
Haverstock-hill.—Nos. 98 and 95 (s.), u.t. 59
yrs., g.r. 16l., y.r. 200l. 3,100

By MOSS & JAMESON.
Edgware-road.—50, Queen-st., f., w.r. 33l. 4s.
Portman-square.—4, 4, and 5, King's-yh.,
u.t. 22 yrs., g.r. 30l., w.r. 242l. 2s. 1,175

14, King's-pl., u.t. 18 yrs., g.r. 26l.,
w.r. 79l. 6s. 280

Hyde Park.—51, Beaumont-st., u.t. 16 yrs.,
g.r. 12l., e.r. 65l. 475

Barnsbury.—61, 59, and 63, St. Clement-st.,
f., w.r. 163l. 10s. 1,900

Hornsey.—33 and 35, Launceston-rd., u.t. 80
yrs., g.r. 18l., y.r. 68l. 665

35, Effingham-rd., u.t. 80 yrs., g.r. 6l. 6s.,
y.r. 80l. 235

8, 16, 18, and 22, Fairfield-st., u.t. 80 yrs.,
g.r. 21l., y.r. 113l. 1,010

May 6.—By H. J. BLISS & SONS.
Bethnal Green.—24, Robinson-rd. (s.), u.t. 48½
yrs., g.r. 6l., y.r. 35l. 380

30, Russell-st., u.t. 48½ yrs., g.r. 4l., y.r. 38l. 18s. 380

Limehouse.—134, Salmon's-la. (s.), f., y.r. 36l.
130, Salmon's-la., and 1, Notgrove-st. (s.),
f., w.r. 62l. 480

3 and 5, Notgrove-st., f., w.r. 41l. 12s. 390

Bethnal Green.—47 to 55 (odd), Tyner-st.,
u.t. 41½ yrs., g.r. 9l. 15s., w.r. 91l. 655

Islington.—11, Hardinge-st., u.t. 26 yrs., g.r.
6l., e.r. 36l. 228

Homerton.—70, Oriel-st., u.t. 70½ yrs., g.r.
4l. 10s., w.r. 31l. 4s. 225

By CLARKE & CO.
Harrow, Middlesex.—10, Springfield-rd. (s.), f.,
y.r. 46l. 560

By O. RAWLEY CROSS & CO.
Notting Hill.—127, Portland-rd. (s.), u.t. 95½
yrs., g.r. 8l., y.r. 40l. 220

By LEOPOLD FARMER & SONS.
Kingsland.—31, Huntingdon-st., u.t., u.t. 64
yrs., g.r. 8l. y.r. 42l. 410

Bethnal Green.—14 and 16, Bonnor-st., u.t.
30½ yrs., g.r. 4l., w.r. 74l. 18s. 580

Islington.—26, Ecclesbourne-rd., u.t. 37 yrs.,
g.r. 5l., y.r. 34l. 380

Walthamstow.—Chesham-st., f.g. 4l. 4s.,
reversion in 88 yrs. 105

Victoria Park.—61 to 71 (odd), Folstead-st.,
u.t. 87 yrs., g.r. 39l., y.r. 156l. 850

By HARD & HARD.
Snarebrook.—Chigwell-rd., "The Lodge," f.,
y.r. 76l. 1,170

By NEWBON, EDWARDS, & SHEPHERD.
City-road.—13, Westmoreland-pl., with fac-
tory, f., y.r. 100l. 1,670

Barnsbury.—Crosley-st., f.g. rents 44l. 2s.,
reversion in 78 yrs. 1,110

Canonbury.—41, Canonbury-rd. (with work-
shop), u.t. 13½ yrs., g.r. 6l. 4s., y.r. 60l.
Wandsworth-road and Devonshire-road.—f.g.
rents 100l. 16s., u.t. 29½ yrs., g.r. 26l. 255

Islington.—Brookby-st., etc., f.g. rents
264l. 10s., u.t. 3½ yrs., g.r. 145l. 10s. 1,090

61, Clondesley-rd., u.t. 12 yrs., g.r. 13l.,
y.r. 30l. 310

By C. G. & T. MOORE.
Stepney.—23, Halley-st., and 9, Ebenezer-pl.,
f., w.r. 40l. 6s. 5325

79 and 81, Old Church-rd., f., w.r. 36l. 8s.
Ponders's End.—1, Glenbourn-ter. (with off-
licence), f., y.r. 56l. 280

By SIMMONS & SONS.
Brixton.—33, Millbrook-rd., u.t. 16 yrs., g.r.
7l., w.r. 52l. 1,300

Walworth.—57, Carter-st., u.t. 40½ yrs., g.r.
5l. 15s. 6d., y.r. 33l. 150

33, Lorrimer-sq., u.t. 40½ yrs., g.r. 6l.,
y.r. 38l. 350

Kensington.—32, Hanover-gdns., u.t. 40 yrs.,
g.r. 6l., e.r. 38l. 420

Willisden.—Conley-rd., f.g. rents 66l. 2s., re-
version in 84 yrs. 290

Dulwich.—205, Upland-rd., and 2, Cresser-st.
(s.), u.t. 64½ yrs., g.r. 7l., p. 1,580

By C. G. TAYLOR & SON.
Mile End.—22, and 23, Buckhurst-st., f.,
w.r. 85l. 16s. 280

87 and 89, Cambridge-rd. (site of), f. 475

By WALTER VINCENT.
East Ham.—29, 31, and 33, Hartley-av., f.
w.r. 86l. 18s. 810

May 6.—By BLAKE & CARPENTER.
Croydon.—Lower Addiscombe-rd., "Cook's
Farm," 34 a. 2 r. 0 p., f. 14,300

Lower Addiscombe-rd., "Barnes," f.,
28 a. 2 r. 31 p.; also "The Grotto," f. 9,600

By B. R. BOSTOCK.
East Ham.—3 and 5, Elizabeth-rd., f., w.r.
52l. 8s. 580

67, 69, 71, and 83, Orchard-st., f., w.r.
76l. 14s. 650

Leytonstone.—Grove-rd., f.g. 15l., reversion
in 72½ yrs. 370

By ELWORTH & KNIGHTON.
South Kensington.—8, Brompton-rd., u.t. 63
yrs., g.r. etc., 43l. 6s., p. 2,000

By FISHER, STANHOPE, & DRAKE.
Tottenham.—23, Vicarage-rd., f., e.r. 28l. 345

By HOLIDAY & STANGER.
Streatham.—70, Buckleigh-rd., u.t. 78 yrs.,
g.r. 7l. 10s., p. 370

1, Barrow-rd., u.t. 73½ yrs., g.r. 7l. 7s., p. 850

By MARK LIEBEL & SON.
Wapping.—51, Great Hermitage-st., f., w.r.
11l. 12s. 310

Bow.—111, Old Ford-rd., a freehold corner
building site, area 28,300ft. 2,700

Candy-st., f.g. 25l., reversion in 66 yrs. 600

Leytonstone.—Newport-rd., 16 freehold build-
ing plots 905

Leyton.—3, 5, 7, and 9, Sunnyside-rd., f., w.r.
104l. 1,090

Poplar.—117, St. Leonard-rd. (s.), u.t. 34 yrs.,
g.r. 2l. 18s., y.r. 30l. 200

Bromley-by-Bow.—57, Orwell-rd., u.t. 60½ yrs.,
g.r. 4l., w.r. 28l. 15s. 250

By NORMAN & NORMAN.
Homerton.—14, Church-rd. (s.), u.t. 61½ yrs.,
g.r. 6l., y.r. 34l. 880

Poplar.—301, Manchester-rd., u.t. 45 yrs., g.r.
5l., w.r. 20l. 10s. 115

By TOWNES, ELLIS, & CO.
Bayswater.—106, Ledbury-rd., u.t. 41½ yrs.,
g.r. 8l. 8s., y.r. 50l. 420

Fulham.—Stanley-rd., f.g. 20l., u.t. 49 yrs.,
g.r. 150

King's-rd., f.g. 20l., u.t. 49 yrs., g.r. 5l. 280

Seaton-rd., f.g. 33l., u.t. 49 yrs., g.r. 10l. 875

Contractions used in these lists.—F.g. for freehold
ground-rent; l.g. for leasehold ground-rent; l.g. for
improved ground-rent; g. for ground-rent; r. for rent;
f. for freehold; e. for copyhold; l. for leasehold; p. for
possession; e.r. for estimated rental; w.r. for weekly
rental; q. for quarterly rental; y.r. for yearly rental;
u.t. for unexpired term; a. for per annum; yrs. for
years; la. for lane; st. for street; rd. for road; sq. for
square; pl. for place; ter. for terrace; cres. for crescent;
av. for avenue; gdns. for gardens; yd. for yard; g. for
grove; h. for house; p.h. for public-house; o. for
office; s. for shops; c. for court.

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MEETINGS.

FRIDAY, MAY 12.

Royal Institution.—Professor E. Fox Nichols on "The
Pressure Due to Radiation." 9 p.m.

Royal Sanitary Institute.—The Institute Dinner,
Prince's Restaurant, Piccadilly. 7 p.m.

SATURDAY, MAY 13.

Northern Architectural Association.—Student's
Sketching Club Excursion.

Junior Institution of Engineers.—Visit to the Dorking
Water, Gas, and Electricity Works. Train leaves
Cannon-street at 1.30 p.m.

Incorporated Association of Municipal and County
Engineers.—Midland District Meeting to be held at
Market Harborough.

MONDAY, MAY 15.

Royal Institute of British Architects.—"Sculpture in
its Relation to Architecture," by Messrs. Alfred Gilbert,
R.A., T. Stirling Lee, W. Reynolds Stephens, and
Professor Langley. 8 p.m.

Surveyors' Institution.—Mr. J. D. Wall on
"The Licensing Act, 1904," with Special Reference
to the Question of Compensation. 8 p.m.

Society of Arts (Confer Lecture).—Mr. H. W. Sav-
shaw on "The Uses of Electricity in Mine." 1. 8 p.m.

THURSDAY, MAY 12.

Society of Arts (Applied Art Section).—Mr. W. H. H.
Hall, M.A., on "Engraving and Printing." 8 p.m.

WEDNESDAY, MAY 17.

Institute of Sanitary Engineers, Ltd.—Examin-
ation and Literary Committee at 2.30 p.m. Final
Committee at 5 o'clock p.m. Council Meeting at
6 o'clock p.m.

Builders' Foremen's and Clerks of Work's Insti-
tute.—Ordinary Meeting of the Members. 8 p.m.

Society of Arts.—Mr. S. O. Phillips on "The Use of
Wood Pulp for Paper Making." 8 p.m.

THURSDAY, MAY 13.

Architectural Association.—Members' Dinner, Criterion
Restaurant, Piccadilly Circus. 7 p.m.

Royal Institution.—Professor Sir J. Devay on
"Flame." 11. 5 p.m.

Society of Antiquaries.—8.30 p.m.

SATURDAY, MAY 13.

Edinburgh Architectural Association.—Visit to Dundee,
under the auspices of the Dundee Institute of
Architecture.

PRICES CURRENT OF MATERIALS.

* * Our aim in this list is to give, as far as possible, the
average prices of materials, not necessarily the lowest.
Quality and quantity obviously affect prices—factors
which should be remembered by those who make use of
this information.

	BRICKS, &c.	
	£ s. d.	
Hard Stocks	1 10	0 per 1000 alongside, in river.
Rough Stocks and		
Grizzles	1 6	6
Facing Stocks	2 2	0
Shippers	2 2	0
Flettons	1 7	0
Red Wire Cuts	1 14	0
Best Portland Cement	3 12	0
Best Red Pressed		
Buabon Facing 5 0 0		
Best Blue Pressed		
Staffordshire	4 2	6
Do. Bulbous	4 7	6
Best Staffordshire		
Fire Bricks	4 0	0
GLAZED BRICKS.		
Best White and		
Ivory Glazed		
Stretchers	12	0
Headings	11	0
Quoins, Bullnoses		
and Flats	16	0
Double Stretchers 18 0 0		
Double Headings 16 0 0		
One Side and two		
Ends	19	0
Two Sides and		
one End	20	0
Slays, Cham-		
ferred, Squints 20 0 0		
Best Dipped Salt		
Glazed Stretch-		
ers and Header 13 0 0		
Quoins, Bullnoses		
and Flats	14	0
Double Stretchers 15 0 0		
Double Headings 14 0 0		
One Side and two		
Ends	15	0
Two Sides and		
one End	15	0
Slays, Cham-		
ferred, Squints 14 0 0		
Second Quality		
White and		
Dipped Salt		
Glazed	2 0	0
Thames and Pit Sand	7	0
Thames Ballast	5	0
Best Portland Cement	37	0
Best Ground Blue Lias Lime 20 0		
NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.		
Grey Stone Lime	12	0
Scourbridge Fireclay in sacks 27s. 6d. per ton at city dep't.		

STONE.

BATH STONE—delivered on road wag- gons, Paddington Depot	1 6	per ft. cube.
Do. do. delivered on road waggon.		
Nine Elms Depot	1 4	
Pondbury Stone (Brown squared).		
Brown Whittied, delivered on road waggon, Paddington depot, Nine Elms depot, or Picnic Wharf.	2 1	
White Bashed, delivered on road waggon, Paddington depot, Nine Elms depot, or Picnic Wharf.	2 4	
Ancestor in blocks	1 1	per ft. cube, delivery dep't.
Beor	1 6	
Greenhill	1 10	
Darley Dale in blocks	8 4	
Red Gorsehill	2 5	
Cloaburn Red Freestone 2 0 0		
Red Mansfield	2 4	
York Stone—Robb's Head Quality Sawn random blocks 2 10		
6 in. sawn two sides landings to sizes (under 40 ft. super.) 2 8		per ft. super.
6 in. rubbed two sides ditto, ditto	2 6	
3 in. sawn two sides slabs (random sizes) 14 in. to 24 in. sawn one side slabs (random sizes)	0 7	
14 in. to 24 in., ditto 0 5		

OILS, &c.

VARNISHES, &c.		Per gallon.
		£ s. d.
Fine Pale Oak Varnish		0 8 0
Pale Copal Oak		0 10 6
Superfine Pale Elastic Oak		0 12 6
Fine Extra Hard Church Oak		0 10 0
Superfine		

Churches and Drury Oak, for seats of	0	14	00
Fine Elastic Cane	0	16	00
Superfine Pale Elastic Carriage	0	16	00
Fine Pale Maple	0	16	00
Finest Pale Durable Copal	0	18	00
French Oil	0	18	00
Eggshell Flating	0	18	00
White Copal Enamel	0	18	00
Extra Pale Paper	0	12	00
Best Japan Gold Size	0	12	00
Dark Black Japan	0	16	00
Orange and Vermilion Stain	0	9	00
Brunswick Black	0	9	00
Berlin Black	0	16	00
Knottling	0	10	00
French and Brush Polish	0	10	00

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on *Thursday*. [X.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.* except in some exceptional cases and for special reasons.]

* Denotes accepted. † Denotes provisionally accepted.

ABERTYSWG.—For supplying and laying about 235 lineal yds. of 12-in. stoneware pipes, 867 lineal yds. of 9-in. stoneware pipes, and 40 lineal yds. of 9-in. cast iron pipes, with manholes and lampholes, at Abertyswg, for the Rhymney Urban District Council. Mr. W. L. Marks, Rhymney, Glamorgan, Valleys, is the Engineer.

D. Jones, 20, Regent-street, Dowds 5272 6 7

ASKAM-IN-FURNESS.—For erecting a manager's house, welfch office, and other buildings at Gaevorsk, for the Dalton-In-Furness Urban District Council. Mr. W. Richardson, Architect and Surveyor, Dalton-in-Furness.

T. Brown	£523 0 0	A. Graham	£366 5 0
T. Bradley	477 15 0	W. H. Buxton,	
G. Martin	375 0 0	Askam*	855 0 0
J. Simpson	800 0 0		

ASKAM-IN-FURNESS.—For gas tank and holder, for the Dalton-in-Furness Urban District Council. Mr. W. Richardson, Architect and Surveyor, Dalton-in-Furness.

W. C. Holmes & Co.	£1,208
W. C. Chambers & Co., Huddersfield ..	1,100
Ashmore, Benson, Pease, & Co., Stockton-on-Tees*	1,073

BANBURY.—New Baptist schoolroom at Culworth, near Banbury. Mr. A. E. Allen, architect and surveyor, 31A, Bridge street, Banbury:—

W. C. Chambers & Co., Huddersfield ..	£139 0		
J. Grant & Sons, 180 100	F. G. Watson, 100		
J. F. Booth	139 5	Southam*	115 10

BLATHERWYCKE.—For widening and part rebuilding bridge, for the Northamptonshire County Council. Mr. C. S. Morris, County Surveyor, County Northampton:—

S. Hipwell & Co.	£1,775 0 0	H. Sturgess & Sons	£943 17 6
F. Hanson	1,157 10 0	W. C. Wells	
S. Jackson	1,150 0 0	Brook, Wellingborough* ..	829 0 0
Siddons & Freeman	990 0 0		

TENDERS.—Continued on page 527.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered
*Extension of Shire House, Norwich	Norfolk C.C.	100l., 50l., and 25l.	Nodate.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered
Infirmary at Alnwick	The Governors	W. T. Hindmarsh, Hon. Sec. to Governors, Alnwick	May 19
Reconstruction of Gasworks, Gourock	Gas Committee	A. D. Murray, Town Clerk, Gourock	May 15
Pair of Cottages		Clark & Moscrop, Architects, Fethams, Darlington	do.
Alterations and Additions to Stabling, Killorby Hall Wks., County Weights & Measures Inspector's Office	Kingston-on-Thames Corporation	Borough Surveyor, Municipal Offices, Kingston-on-Thames	do.
Flagging to Footpath, Carver Clough	Rishworth U.D.C.	R. Horsfall & Son, Archts. & Survs., 22A, Commercial-st., Halifax	do.
Relaying Curb and Channel	do.	do.	do.
Six Purifiers at Foleshill	Coventry Gas Committee	F. W. Stevenson, Engineer, Gasworks, Coventry	do.
Wrought-iron Railing at One Tree Hill, Honor Oak	Camberwell Borough Council	W. Oxboby, Borough Engineer, Town Hall, Camberwell	do.
Private Street Improvements	Ashton-in-Makerfield U.D.C.	T. Burgess, Surveyor, Council Offices, Ashton-in-Makerfield	do.
500 yds. 18-in. Concrete Cylindrical Tubes	East Ham Corporation	A. H. Campbell, Borough Engineer, Town Hall, East Ham	do.
Warming and Ventilating, Central Library, Darley-st.	Bradford Corporation	City Architect, Whitaker-buildings, Brewery-street, Bradford	do.
Painter Work at Residence and Mortuary, Bangour	Edinburgh District Lunacy Board	do.	do.
Steel Flat-bottomed Bells and Fish Plates	Leeds Corporation (Waterworks)	H. J. Blane, R.S.A., 25, Rutland-square, Edinburgh	do.
Iron Syphon under River Nidd	Knareborough U.D.C.	Waterworks Committee, Town Hall, Leeds	do.
Three Houses on Orsledge, near Tredegar	Blackburn Highway Committee	D. W. Price, Cloth Hall, near Tredegar	do.
Library, Newbury	Free Library Committee	F. Quekett Lough, Town Clerk, Newbury	do.
Materials	Glasgow Corporation	T. Malvin 30, Cochrane-street, Glasgow	do.
*Alterations and Additions to Schools, Knapthill	Survey Education Committee	Jarvis & Richards, Architects, 36, Victoria-street, S.W.	do.
Stores	Bradford Cleansing, etc., Committee	Superintendent Call, Hammerston-street Depot, Bradford	May 15
600 lin. yds. of Iron Fencing, New Recreation Ground	Cowes U.D.C.	J. W. Webster, Surveyor to Council, Cowes	do.
Two Houses, Aynsley-terrace, Consett	Messrs Clough & Pounder	J. H. Murray, Architect and Surveyor, Front-street, Consett	do.
Two Houses and Premises, Bridlington	Mr. T. Grimshaw	J. Earnshaw, Architect, Bridlington	do.
Villa, Pentre	Mr. W. Williams	J. Rees, Architect, Pentre	do.
*Road-making and Paving Works	Wilkesden District Council	Council's Engineer, Dyne-road, Kilburn, N.W.	do.
*Steel Fencing, Gates, and Fixing Same	Bromley Borough Council	Borough Engineer, Bromley, Kent	do.
Works at Chapel House Reservoir	Aspatrin, Selloth, etc., Water Board	C. B. Newton, Engineer, Whitehall-chambers, Carlisle	May 17
300 yds. of Guernsey Granite	Ham U.D.C.	A. H. Pritt, Surveyor, Sudbrook Cottages, Ham Common, S.W.	do.
200 yds. of Broken Brown Kent Flints	do.	do.	do.
Cartage Work	West Riding C.C.	F. G. Carpenter, County Surveyor, Wakefield	do.
Strengthening by Work of Tudorston Stone Bridge	East India Railway Co.	C. W. Young, Secretary, Nicholas-lane, London, E.C.	do.
Steel Ball-headed Balls	Salisbury U.D.C.	City Surveyor's Office, Endless-street, Salisbury	do.
Extension of Public Swimming Baths	Leith Corporation	Burgh Electrical Engineer, Junction-street, Leith	do.
Coal Elevating and Conveying Plant	do.	do.	do.
Roller-House Auxiliary Plant	The Trustees	W. D. Morgan, Architect, Victoria-chambers, Pentre	do.
New Hope English Baptist Chapel, Gelli	Standing Joint Committee	J. H. Morgan, Architect, Charles-street-chambers, Cardiff	do.
Baptist Chapel in Hanbury-road, Bargoed	Selby U.D.C.	P. Griffith, Engineer, 54, Parliament-street, Westminster, S.W.	do.
Road at New Waterworks at Brayton Barff, Selby	Scarborough Town Council	H. W. Smith, Borough Engineer, Town Hall, Scarborough	do.
Public Conveniences and Offices, West Pier	The Guardians	W. G. Scott & Co., Architects, Victoria-buildings, Worthing	do.
House at Flimby Lodge, Cockerthorpe	Fredericgarst Burial Board	H. Thomas, Surveyor, Haverfordwest	do.
Fencing-in, etc., Burial Ground at Frendergarst	Midland Railway Co.	Company's Architect, Cavendish House	May 19
Cleaning and Painting Station Buildings, etc.	Trustees of Bethany Baptist Chapel	W. D. Morgan, Gas Engineer, Birkbehead	do.
Schoolroom, Votry, House, etc., Treherbert	Birkenhead Corporation	C. O. Paterson, County Council Offices, Newport, Mon.	do.
1,000 tons of Lime	Monmouthshire C.C.	W. Tanner, County Surveyor, County Council Offices, Newport, Mon.	do.
Repairs of Main Roads	Chorlton Guardians	Porter at the Union Offices	do.
Inale Ptg., etc., Union Offices, All Saints, Manchester	Bradford Hebrew Congregation	Inspector of Lighting, 52, College-street, Glasgow	do.
Synagogue, Spring-gdns., Manningham-lane, Bradford	Elmhurst Corporation	Public Works Office, City-chambers, Edinburgh	May 13
Square Lanterns (5 to 6 000)	Bridgworth Corporation	Borough Surveyor, Bridgworth	do.
Bowling Pavilion, etc., Regent-road, Edinburgh	Kingston-upon-Hull Corporation	Inspector of Nuisances, Hanover-square, Hull	May 20
Renewal, etc., of Iron and Stonework of Bridge	Carlisle D.D.C.	Clerk, 7, Victoria-place, Carlisle	do.
Eight Dwelling-houses, Jagger Green-lane	Keighley Electricity Committee	J. M. Smyth, Boro. Electrical Engineer, Electricity Wks., Keighley	do.
Nightsoil Collection	Stafford County Asylum	W. H. Chedde, County Surveyor, Stafford	do.
Removing Asphalt Contents	Trustees of New Baptist Church	H. Waters, Architect, Beaufort	do.
Superchairs	Manchester Education Committee	W. H. Talbot, Town Clerk, Manchester	do.
Repainting Exterior of Stafford Asylum Buildings	Leeds R.D.C.	J. H. Ford, Clerk, Poor Law Buildings, Leeds	do.
Chapel and Schoolroom, Mount Pleasant-rd., Ebbw Vale	Corporation	Borough Engineer, King-street West, Wigau	do.
Timber for Handicraft Centres	The Corporation	Dr. D. M. Bary, Grampound, Cornwall	do.
Road Materials	Directors Powell Duffryn St. Coal Co.	W. Harpur, Borough Engineer, Town Hall, Cardiff	do.
Thirteen Cottages in Spring-gardens, Wigan	Burgess Hill U.D.C.	Imnes Estate Office, Urquhart, N.B.	May 22
Alterations, etc., Grampound National School	Leeds Gas Committee	Fiddich Cottages, Ardilly, N.B.	do.
Bandstand, Spott Park, Cardiff	do.	Stores Manager, Aberaman Offices, Aberdare	do.
Farm Steading, Branton, Urquhart	do.	A. P. Hardwick, Clerk, Burgess Hill	do.
Dwelling-House, Dinnelbom	Warrington Paving, etc., Committee	R. H. Townsley, Gas Offices, East-parade, Leeds	do.
Stores	Rev. Canon Lewis	do.	do.
Flints and Gravel	Col. H. Platt, C.B.	T. Longdin, Borough Surveyor, Town Hall, Warrington	do.
Lime	Romford R.D.C.	J. Thropp, Surveyor, 29, Broadgate, Lincoln	do.
Wrought-iron Tubes	Hastings Education Committee	J. Rees, Architect, Pentre	do.
Pressed and Common Red Bricks	Colchester Corporation	T. B. Farrington, Engineer, Trinity-square, Llandudno	do.
Self-laced Bradford or Halifax Flags	Lancashire & Yorkshire Railway Co.	G. Lapwood, Highway Surveyor, Victoria-chambers, Romford	do.
Granite Cubes and Setts	Birkenhead Corporation	O. A. Pigott, Architect, Saxon-chambers, London rd., Romford	do.
Removing Weeds from Rivers Witham, Brant, & T.	Epsom B.D.C.	C. E. Bland, Town Hall, Colchester	do.
Schoolroom on St. David's Church Ground, Ton	Visiting Com., Croydon Mental Hos.	C. T. Estlin, Architect, Bank-chambers, Heathfield-st., Swansea	do.
Excavating, etc., and Laying Pipes, Gorrindon	South Shields Corporation	Mr. Catto, Baker, Aberlour	May 23
Road Material	Newton Abbot R.D.C.	Engineer's Office, Hunt's Bank, Manchester	do.
Heating Apparatus, Olive Vale Schools, Hastings	Derbyshire C.C.	Ferries Manager, Woodsey, Strickhead	do.
Cast-iron Mains, etc.	Pembroke U.D.C., Co. Dublin	The Vicarage, Thornaby-on-Tees	do.
Cast-iron Mains, etc.		Council Offices, Waterloo-road, Epsom	do.
Villa Residence, London-road, Gorseinon		G. F. Carter, Borough Engineer, Town Hall, Croydon	do.
Double Twin-screw Ferry Steamer		J. H. Cawthra, Borough Electrical Engineer, South Shields	do.
Internal Works to Channel, Thornaby Church		S. Segar, Union-street, Newton Abbot	May 24
Two Extensions of Sewers, West Ewell		J. S. Segar, County Offices, St. Mary's-gate, Derby	do.
Cricket Pav., Cast-sheds, etc., at Warrington Hospital		J. C. Maaly, Clerk, Town Hall, Ball's Bridge, Pembroke, Co. Dub.	do.
Quarter-mile Oak Pole Fencing, Warrington Hospital			
Pipes, etc., Electricity Works			
Wooden Platforms under Quay			
Isford Water Supply (Reservoir for 10,000 gallons)			
Lock-up at Marple Bridge, near Stockport			
Supplies			

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered
Steel Coal Buckers, etc.	Islington Lighting Committee	W. F. Dewey, Town Clerk, Town Hall, Upper-street, N.	May 24
100 yds. Gas Mains, Sheerness-on-Sea	Sheppy Gas Co.	H. Barber, 3, Trinity-road, Sheerness-on-Sea	do.
New Outfall Surface Drain, Mill-road, etc.	Rugby U.D.C.	D. G. Macdonald, Surveyor, Rugby	do.
Improvement of Old Bodringhall Schools into one Dept.	Rhondda U.D.C.	J. Rees, Architect, Hillside Cottage, Pentre	May 25
Street Stalls, Nelson, Lancs.	Market and Library Committee	B. Ball, Borough Engineer, Town Hall, Nelson, Lancs.	do.
New Council School, Cuxton	Kent Education Committee	G. E. Bond, Architect, 384, High-street, Rochester	do.
Improvement and Mortuary, West Hampstead	Aston Manor Town Council	Town Clerk, Town Hall, Hampstead, N.W.	do.
Grand Over Roadway Brook, Aston-road North	Carlisle Guardians	G. Armstrong, Architect, 24, Bank-street, Carlisle	May 26
Plans, etc., to Heating Apparatus, Rushell Workho.	Felling U.D.C.	H. Miller, Architect, Council Building, Felling	May 27
Plans to Windy Nook Council School	Edinburgh District Lunacy Board	H. J. Blane, R.S.A., 26, Rutland-square, Edinburgh	do.
Electric Light Plant, Jangour Village	Sheffield Guardians	H. L. Potter, Architect, 24, Norfolk-row, Sheffield	do.
General Block at Union Hospital, Fir Vale	Tynemouth Corporation	G. R. Boreham, 24, John-street, Sunderland	do.
Completion of Tower, St. Peter's Ch., Stockton-on-T.	The Sisters of St. John of God	J. F. Smillie, Borough Surveyor, Tynemouth	May 28
Waterworks, Morpeth-terrace, etc., Percy Main	Great Northern Railway Co., Ireland	W. H. Byrne & Son, Architects, 20, Suffolk-street, Dublin	do.
Plant at Kilmore, Co. Wexford	Merthyr Tydfil U.D.C.	E. A. Johnson, Architect, Amen's-street Terminus, Dublin	May 29
Gasometer and Goods Engines	Blithing Guardians	Union Offices, Bulcamp, Halesworth, Suffolk	do.
Gas Library, Dowling	Falkland Town Council	R. B. Pratt, Architect, Town and County Bank-buildings, Elgin	do.
For Escape Staircase, etc., at Bulcamp Workhouse	Central London Sick Asylum Dist.	Asylum, Cleveland-street, Fitzroy-square, W.	do.
Gasworks Premises, Lissington	Dublin Corporation	G. S. Carran, C.E., 1, Eskine-place, Edinburgh	do.
Gasworks, etc., Interior of Asy., Cleveland-st., W.	Strabane and Letterkenny Rly. Co.	S. Hart, City Engineer, City Hall, Dublin	May 30
Gasworks, etc., Interior of Asy., Cleveland-st., W.	Sternfield Town Lands Trust	J. Barton, C.E., Exchange-buildings, Dundalk	May 31
Gasworks, etc., Interior of Asy., Cleveland-st., W.	Rev. C. Casey	J. Fry, Solicitor, Nassundham	do.
Gasworks, etc., Interior of Asy., Cleveland-st., W.	Glasgow Corporation	W. A. Scott, Architect, 74, Hollybank-road, Drumcondra, Dublin	June 1
Gasworks, etc., Interior of Asy., Cleveland-st., W.	Pontefract Guardians	Office of Public Works, City-chambers, 64, Cochrane-st., Glasgow	do.
Gasworks, etc., Interior of Asy., Cleveland-st., W.	Barnet District Gas Co.	Garside & Pennington, Architects, Pontefract	do.
Gasworks, etc., Interior of Asy., Cleveland-st., W.	Commissioners National Education	W. D. R. Taggart, Architect, Scottish Provident-buildings, Belfast	do.
Gasworks, etc., Interior of Asy., Cleveland-st., W.	Education Committee	J. F. Peasey, Architect, South Walks, Dorchester	do.
Gasworks, etc., Interior of Asy., Cleveland-st., W.	Stranorlar R.D.C.	T. H. Martin, Engineer, Station-road, New Barnet	June 2
Gasworks, etc., Interior of Asy., Cleveland-st., W.	Essex Education Committee	J. F. Fuller, F.S.A., Architect, 179, Great Brunswick-st., Dublin	June 3
Gasworks, etc., Interior of Asy., Cleveland-st., W.	Brentford U.D.C.	Hawe & Foley, Architects, North Bar-street, Beverley	do.
Gasworks, etc., Interior of Asy., Cleveland-st., W.	Manchester Ship Canal Co.	G. McLaughlin, Clerk, Board-room, Stranorlar	June 5
Gasworks, etc., Interior of Asy., Cleveland-st., W.	Bosmere and Clayton R.D.C.	F. Whitmore, County Architect, Duke-street, Chelmsford	do.
Gasworks, etc., Interior of Asy., Cleveland-st., W.	Metropolitan Asylums Board	Council's Engineer, Boston-road, Brentford	June 6
Gasworks, etc., Interior of Asy., Cleveland-st., W.	The Vicar, etc.	W. H. Hunter, Engineer, 41, Spring-gardens, Manchester	June 7
Gasworks, etc., Interior of Asy., Cleveland-st., W.	J. A. James, Architect, Port Talbot	J. S. MacGregor, Surveyor, Needham Market	June 8
Gasworks, etc., Interior of Asy., Cleveland-st., W.	Griffiths, Messrs., n. Cymmer, Poch	Office of the Board, Embankment, E.C.	June 14
Gasworks, etc., Interior of Asy., Cleveland-st., W.	F. W. Dixon, Architect, Trevelyan-buildings, Manchester	do.	do.
Gasworks, etc., Interior of Asy., Cleveland-st., W.	J. W. Broughton, Architect, 19, High-street, Skipton	do.	do.
Gasworks, etc., Interior of Asy., Cleveland-st., W.	Tolli & Lee, Architects and Surveyors, 7, St. Aldate's, Oxford	do.	do.
Gasworks, etc., Interior of Asy., Cleveland-st., W.	W. Holland, Hollowell School, Northampton	do.	do.
Gasworks, etc., Interior of Asy., Cleveland-st., W.	A. Goddard, Sec., Educ. Office, Northumberland-rd., Newcastle	do.	do.
Gasworks, etc., Interior of Asy., Cleveland-st., W.	E. Jones, Gasworks, Aberaman	do.	do.
Gasworks, etc., Interior of Asy., Cleveland-st., W.	Albion Rwyer Colliery, Ledston Station, near Castleford	do.	do.
Gasworks, etc., Interior of Asy., Cleveland-st., W.	J. Llewellyn Smith & Davies, Architects, Aberdare	do.	do.
Gasworks, etc., Interior of Asy., Cleveland-st., W.	J. Judson & Hudson, Architects, Oakworth, near Keighley	do.	do.
Gasworks, etc., Interior of Asy., Cleveland-st., W.	A. O. Evans, Williams & Evans, Architects, Pontypridd	do.	do.
Gasworks, etc., Interior of Asy., Cleveland-st., W.	A. Pells, Architect, Beccles	do.	do.
Gasworks, etc., Interior of Asy., Cleveland-st., W.	W. G. Turt & Goodchild, St. Olave's, 18, Ironmonger-lane, E.C.	do.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
Municipal Assistant	Nottingham Corporation	£402. per annum	May 17
High Engineer and Surveyor	Metropolitan Borough of Woolwich	£604. per annum	May 22
Chief Foreman	Borough of Longton	2l. 10s. per week	May 24

Those marked with an (*) are advertised in this number.

Competitions, iv.

Contracts, iv. vi. viii. x.

Public Appointments, xiv.

TENDERS.—Continued from page 525.

<p>WIMBORNE.—For erecting a stone bridge at Cwmyglo, Llanarney, for Carmarthen Rural District Council. Mr. Gomer Henry, Surveyor, Llanarney, near Kidwelly:—</p> <p>D. D. Mainwaring, Cross Hands, Llanelli* £525 10</p>			
<p>HARROGATE.—For street improvement works off Robert-street, for the Corporation. Mr. F. Bagshaw, Borough Engineer and Surveyor, Harrogate:—</p> <p>E. Long, 7, Forest-avenue, Starbeck, Harrogate* £433 4 10</p> <p>Edzard & Johnson, Forest-avenue, Starbeck* 188 5 9</p>			
<p>HEADINGLEY.—For Leeds Girls' Grammar School, for the Committee. Messrs. Conyon & Chorley, architects, 16, Park-place, Leeds. Quantities by architects:—</p> <p>I. Gould £19,404 0 W. Wilson & Arncliffe £17,482 0</p> <p>Hodgson £18,927 0 T. Hannam £17,480 0</p> <p>W. Irwin & Co. 18,657 0 J. Pullan £17,327 0</p> <p>B. Graham 18,030 0 P. T. Wright £17,165 0</p> <p>W. Lloyl 17,775 8 P. Rhodes £17,098 0</p> <p>H. Atkinson 17,555 0 W. Nicholson £16,950 0</p> <p>Sons 17,555 0 Sons £16,950 0</p> <p>J. Tomlinson 17,490 0 W. Airey £16,760 0</p> <p>Sons 17,490 0 Sons £16,760 0</p>			
<p>HANWELL.—For the erection and completion of a lecture-hall in Bridge-road. Messrs. W. G. Tutt & Goodchild, architects, 18 and 19, Ironmonger-lane, Cheapside, E.C. Quantities by Mr. F. D. Hickman, 18 and 19, Ironmonger-lane, Cheapside, E.C.:—</p>			
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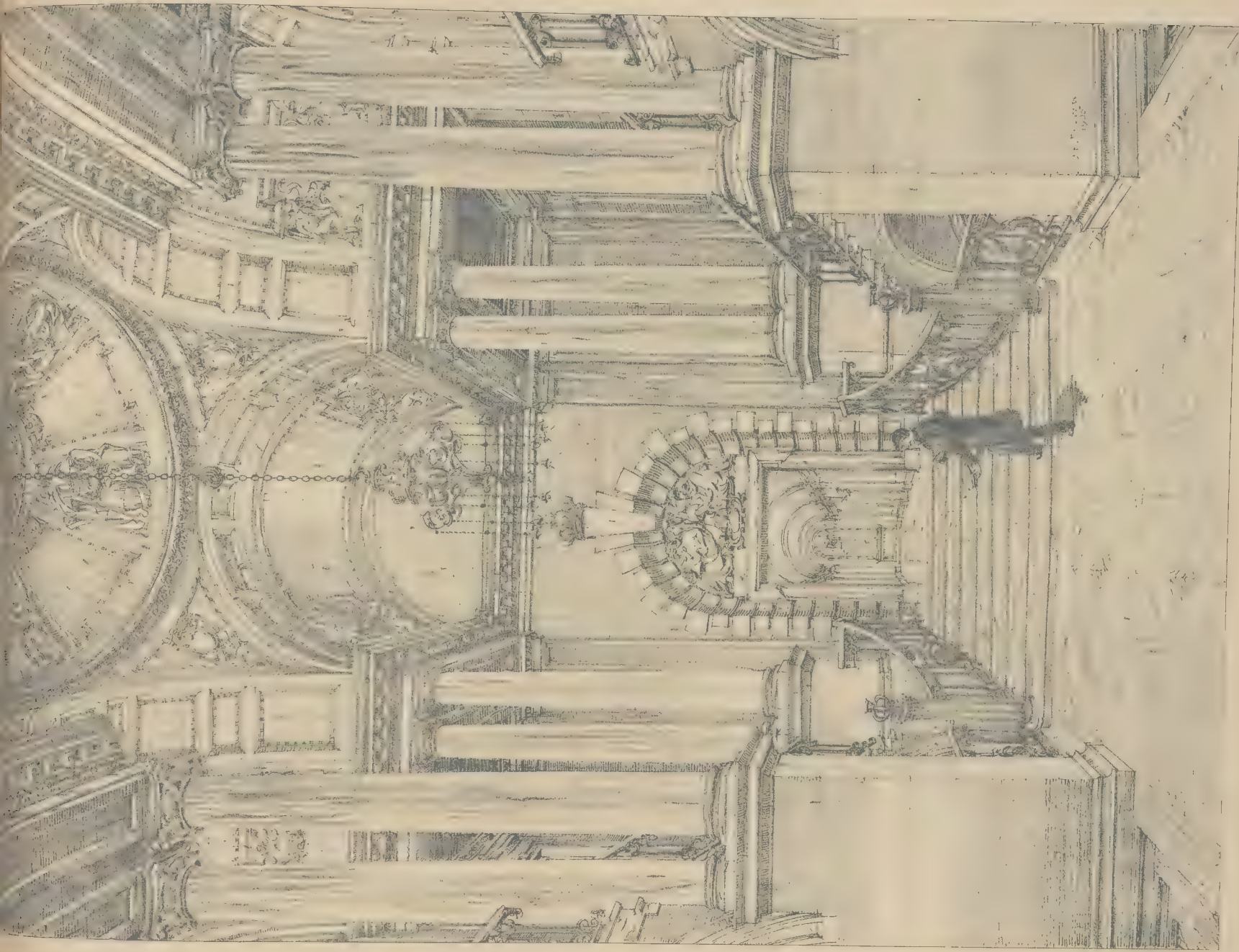
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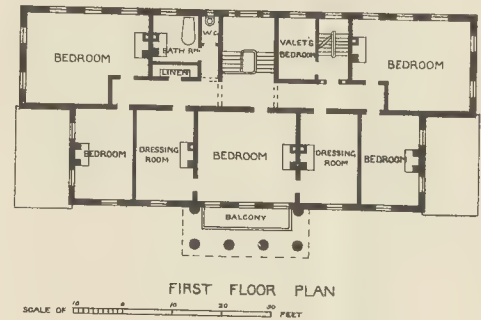
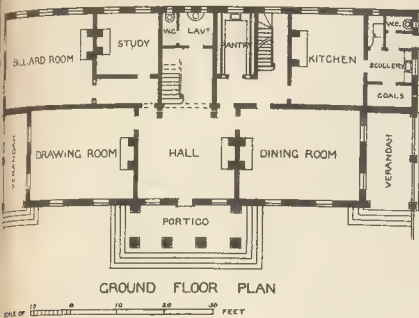


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2. Perspective View, First Premiated Design.....	Ditto Ditto.
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So-called Temple of Minerva Medica.



THE so-called Temple of Minerva Medica is the first building of Imperial Rome that strikes the eye of the modern traveller when he enters within the circuit of her walls. Although this first glance from the temple attracts all the attention that the majority now upon it. Thirty or forty years ago it stood among vineyards and gardens, and now, alas! its surroundings can only be described as picturesque or attractive—railway lines on the one hand and mean streets on the other. It deserves, however, more notice than it generally receives, for it is a building of considerable interest from the archaeological and the architectural standpoint. The archaeologists of the day are unanimous in rejecting the traditional appellation (which rests upon evidence at all) and tend to find in it a nymphaeum of the Horti Liciniani, a favourite resort of the Emperor Gallienus (himself a Licinius*) (cf. for example, Leclercq, "Ruins and Excavations," 1898), though the most recent writer of the subject, Prof. Hulsén, in his (immediately forthcoming) completion of Jordan's "Römische Topographie," considers the

evidence insufficient to justify the identification (p. 358).

In any case, the building appears to belong to the IIIrd century A.D. To date it more accurately from purely internal evidence would be difficult without direct information from brick stamps, and that is not at hand; while inferences from the comparative thickness of the bricks and of the courses of mortar which form the facing of its concrete walls are apt to be fallacious if pressed too closely, though they serve well as general guides. Still, that it is pre-Constantinian seems pretty certain. It has been added to, however, in later times; two huge buttresses on the south would seem still to belong to the latter part of the IIIrd century,* while to the Constantinian period (to which the spread of the use of *opus mixtum* is generally attributed—and probably with correctness, though it appears a good deal earlier in conjunction with *opus reticulatum*—even in Pompeii) may be probably attributed further considerable additions,† consisting of a large exedra, or curved hall, on each side, which was roofed with a semi-dome, and a vestibule on the north, connected with the exedra by other structures, the nature of which is not altogether clear. Being of subordinate importance, they have never,

indeed, been carefully studied*; but the original building—the central hall itself, a decagonal structure with a dome—has recently been subjected to a very careful examination by Signor Gustavo Giovannoni, in the "Annali della Società degli Ingegneri e degli Architetti Italiani," 1904 (xix.), 165-201 (with pl. iii., iv.). He sees in it rather a hall belonging to a great thermal edifice than a nymphaeum; and it may be added that the later vestibule appears to have been heated by hypocausts.

The important part of Signor Giovannoni's work is, however, that in which he deals with the construction of the domed hall itself and of the place which it occupies in the development of architecture.

The ground plan consists of a slightly irregular decagon, at each of the angles of which stands a pillar; these are connected by arches, and on every side except the entrance (which faces almost due north) there is an apsidal niche, that opposite the entrance being a trifle wider (6.90 as against 6.25 metres). The four apses which adjoin the transverse axis of the building (two on each side) were originally open, having four columns at the back instead of a brick wall with a rectangular niche in it, like the rest; but when the large exedrae were added they were partially filled up, doorways being left in them, the skewed arches over which are interesting and well arranged so as to harmonise the original edifice with the later additions.

* Signor Giovannoni does not show the whole extent of them in his plan, nor is his representation of them quite exact.

* Leclercq (loc. cit.) considers that the Licinian nymphaeum properly hereabouts from the time of the emperors; while Giovannoni (op. cit. *infra*), thinks that the gardens passed into the imperial domain during the reign of Gallienus' father Valerian—no grounds is not apparent.

* A trial measurement gave the average thickness of the bricks and of the courses of mortar in the original construction as 35 and 27 mm. respectively, while in the adjacent buttress the figures are 29 and 27 mm.

† The drawing No. 15 of the album attributed to Andrea Coner ("Papers of the British School at Rome," ii.), reproduced in *Builder*, Feb. 4, 1905, p. 110, does not differentiate the various periods of construction, and has various minor inaccuracies.

This lower story is 12.06 mètres (39½ ft.) in height; and upon it rests another, which represents the drum of the dome and consists simply of another decagon with windows between the pillars. The later additions, to which we have already alluded, have almost entirely hidden the exterior of the pillars of the lower story, but have not produced modifications in the upper. Above the windows is a small cornice 17.55 metres (57½ ft.) above the floor level of the interior, and immediately above it come the pendentives, which are here spherical triangles upon a different plane from that of the dome itself (Rivoira, "Origini dell' Architettura Lombarda," i., 31, 32); they have, however, practically no structural function, as they were almost entirely constructed of plaster, the actual connexion of the walls with the inscribed circle with which the dome begins being extremely irregular. The dome itself is, internally, a slightly flattened semi-circle with a diameter of 23.9 metres (78½ ft.), the exterior of it being gradually stepped off, as in the Pantheon. Its construction is most remarkable, consisting of a framework like that of an umbrella, with ten ribs, which, as Isabelle observed before the fall of the dome in 1828 ("Édifices Circulaires," p. 60), were keyed into a ring at the summit. These ribs* are composed of arches of bricks measuring about 2 Roman ft. by 1; in the lower third of the dome there are five of these arches in each rib, but above this point (which marks a change in the structure—it is here that the steps on the outside commence) there are only three, the intervals between them being filled with lighter materials. The separate arches are connected by intermediate courses of larger tiles (Signor Giovannoni's drawing on p. 179 indicates this arrangement clearly). The spaces between these ribs are filled with small pieces of tufa laid in courses, with bonding courses of tiles at intervals, in the lower part of the dome, while in the upper the arrangement is less regular and the materials are lighter. Traces of modifications in design during the period of construction may be noticed; thus, in one of these spaces there is the start of an intermediate rib, the construction of which, however, did not proceed far, the builders having, no doubt, observed that it would have been absurd to impose a part of the strain on the key of the arches between the pillars. In three other spaces two intermediate ribs, with an arch resting upon them, may be seen; this reveals, apparently, an intention, afterwards abandoned, to leave some small windows in the dome itself. None of these attempts reach beyond the point which has been noticed as indicating a change in the structure, about one-third from the bottom of the dome.

The object of the architect who adopted this remarkable method of construction was evidently to reduce the mass of material employed in the dome itself, and so simplify the process of construction. The ribs carry the weight to the angles of the decagon, where there are strong pillars to support it; while, by making the ribs first of all, a considerable economy of time and labour

must have been effected, inasmuch as far less scaffolding than usual would have been necessary. The result, however, was not altogether satisfactory; two enormous buttresses were soon added at the south end, opposite the entrance, while the other eight pillars were all, to some extent, strengthened by the constructions which are generally attributed to the Constantinian period (though these were not, of course, primarily intended to produce this effect), and which, as we have seen, are no part of the original plan—a fact not recognised in Mr. E. F. Reynolds's paper recently read before the Architectural Association, and reported in the *Builder*, February 4, 1905, p. 117. And even with these additions the dome was not strong enough to last up till the present day; the earliest views of the building which we possess show that the western pillar at the south end, in spite of the huge buttress by which it was strengthened, had already collapsed by the end of the XVth century, and with it the rib which it supported with the sections of the dome adjacent to it (cf. *Alb. Giovannoni*, "Roma Antica" (1616), i., 74—a rare and important collection of views of ancient Rome). In the XVIIIth century we see that the process of disintegration had gone further, the intermediate filling having become detached from the ribs, and the centre of the dome collapsed in 1828, carrying with it the scaffolding which had actually been erected with a view to attempting a restoration. The *coup de grace* was given by a stroke of lightning not very long afterwards.

The actual causes of the collapse were, according to Sig. Giovannoni, who enters into careful statical calculations, the lack of cohesion between the ribs and the intermediate filling, and the lack of consolidation of the whole, due probably to hasty construction. Had these dangers been guarded against, there was, according to him, no defect in the plan of the building which need have led to its ruin.

A reconstruction of the interior follows, with a few remarks on the remains of its decoration, which are scanty, but sufficient to enable some idea to be formed of the arrangement. It was, no doubt, faced entirely with marble except in the dome and semi-domes, where stucco would have been used. It was also decorated with statues, a considerable number of which have been discovered at different periods. A few general remarks on the evolution of the dome in Roman architecture conclude the paper. We see that, while Roman constructive architecture was steadily progressing, so that in this branch the Basilica of Maxentius marks the highest level perhaps ever reached, there had been, since the time of Trajan, such a decline in the invention of architectural forms, that its ornamental members can only be called miserably poor.

In the development of domical construction the so-called Temple of Minerva Medica occupies an important place.

The first domes that meet us in Roman architecture are not true domes, but (at any rate, after the solidification of the concrete of which they are composed) are solid masses resting upon the lateral walls, and depending for their cohesion

upon the strength of the mortar which binds their materials together. Such are the domes of the round temple at Tivoli, and of some of the tombs of the 1st century B.C. But the articulation of the mass soon begins, especially when it comes to construction on a large scale, and in the Pantheon (which we now know to belong to the 12nd century A.D.) we find a complicated system of arches in the lower part, at any rate, of the dome, much of the structural value of which, however, must have disappeared after the consolidation of the mass in concrete of the dome itself.

In the meanwhile the adoption of spherical pendentives had made it possible to raise circular domes upon square or polygonal structures, the first two examples of which appear on a small scale in two square tombs on the Via Nomentana; while in the Baths of Caracalla we get a circular dome over a large hall which is square outside, octagonal inside.†

The building which we have been examining comes next in order of development, and contains several new characteristics—(1) its plan, a decagon with projecting apsidal niches; (2) the reduction to a minimum of the size of the elements of the structure; (3) the arrangement of the dome, already alluded to; (4) the attempt at windows in the dome itself; (5) the buttresses on the outside of the pillars.

In the tomb of the Empress Helena, mother of Constantine (now known as Tor Pignattara), we find a new method of lightening the vaulting of the dome adopted (which may also be seen in vaults in the Circus of Maxentius on the Via Appia), namely, the introduction of large earthenware jars, or amphorae, of the shape of which resembles that of pine-cones (*pigna*, whence the name which, being left hollow, considerably diminishes the weight. Two generations later the mausoleum of the daughter of Constantine (now known as S. Costanza) marks a further progress: for here we have a central drum supported by columns with a vaulted passage around it.

After the time of Constantine no further progress was made, no new forms invented, as we see in the Lateran baptistery and in the (now deserted) mausolea near S. Peter's, which were known as S. Petronilla and S. Andrea.

During the Vth century, however, the development of new elements continued in Ravenna,‡ on the lines traced by the architects of those domical buildings in Rome of which we have already spoken. The dome resting on pendentives was further developed in the mausoleum of Galla Placidia, a building which precedes all others of the same kind in the Byzantine world and was the work of Ravenna architects. The Greeks drew from Ravenna the idea which they carried into execution on a larger scale in S. Sophia at Salonica and finally brought to completion in S. Sophia at Constantinople. They did not, however, create new conceptions, but merely developed

* See Hülsen, *Römisch-Mittelalt.* 311, Armanini e Beltrami, *op. cit.* 179.
† At Hadrian's Villa, in the *op. cit.* Piazza d'Oro, we have all the windows.
‡ See Rivoira, *op. cit.* 179, 180, i., ch. 3, on the whole question.

* The thickness of each rib is only about 2 ft. (p. 179 *med.*).

rich already existed—if only in embryo in Roman architecture. For in the lines of these and other great churches the Vth and VIth centuries we find many of the characteristics of the monuments of which we have been speaking—ribs of brick with intermediate ribs of lighter material arranged in series, external buttresses, windows in the dome, apses projecting outwards from the pillars, spherical pendentives, &c.

The similarities that we meet in the Lombard architecture of the XIth century are, on the other hand, in Signor Giovannoni's opinion, not the result of direct imitation; this, however, we find in the great domes of the Renaissance—Brunelleschi's dome of S. Maria del Fiore at Florence, and even more in the dome of S. Peter's at Rome.

In conclusion, one or two points of detail may be noted—thus, in the reference to Martin Heemskerck (p. 166, n. 1) drawing (vol. ii., f. 49) of the Berlin collection is cited among the engravings; and it might further be added that Michaelis ("Jahrbuch des Instituts," 1891, 162) considers that it shows, not a nymphaeum itself, but an unknown building similar to it. A representation of an earlier date than any of those cited is to be found in a rare engraving by the Master of the Bird, who signs with the initials I.B. (Bartsch, "Peintre-graveur," iii., 246, No. 3).

Again, it is hardly the case that Cartoli saw the statue of Minerva with the serpent excavated; his exact words are "in the garden of Minerva was found the statue of the goddess." *

Further, not all the niches in the additions of the Constantinian period are semi-decagonal (p. 181). But these are very small points after all, and do not affect the general value of the article, upon which it may be said without reserve that Signor Giovannoni deserves cordial congratulation.

NOTES.

Workmen's Compensation Bill. THE Bill to amend the Workmen's Compensation Act has passed through Committee in the Lords with but trifling alteration. A promise was given that the drafting of Clause 4, sub-clause 3, which exempts the employer from liability to a sub-contractor's workmen when the accident occurs on other premises, should be considered at a later stage in the Bill. We have already pointed out that this sub-clause as drawn does not even attain the objects recommended by the Departmental Committee since it is not clear that the undertaker's own premises alone are intended. In Clause 7 it was agreed that "smithies" should specifically be stated to include "shoeing forges," and consideration was promised to the point whether the undertakers of a railway should not be defined as the persons having "the actual use and occupation thereof," instead of the "owners and lessees." In paragraph 7 of the second schedule an amendment was agreed to that if an arbitrator should become unfit or be unable to act, the

County Court judge (in place of a judge of the High Court as at present required by the Bill) should have powers to appoint a new arbitrator. So many points require elucidation if this Bill is to become a practical working measure that it is to be regretted they were not discussed at this stage in the Bill. In our issue for April 8 we drew attention to one or two important questions, and it is to be hoped they may still receive consideration before the Bill becomes law.

In the House of Commons Motor Cars.

last week the President of the Local Government Board was asked to furnish a return of the casualties caused by motor cars in Great Britain and Ireland, but he stated that he could only give the figures for the metropolitan district, since in that area alone did accidents generally come under the notice of the police. We have frequently urged that some machinery should be established for securing a return on this subject. With the increased care of the Legislature for the injury to the limbs or for loss of life of the individual in connexion with factories, railways, and other undertakings, it is somewhat anomalous that the dangers of the road are taken so little into account, yet a factory is a place of safety where small risks are run compared to those incurred on our roads now that they are turned into tracks for express traffic, where the signals employed on railways are also absent. The recklessness and want of consideration of motorists is again attracting the attention of the Press, and the number of convictions for offences under the Motor Act is increasing, yet dwellers in the country universally testify they have little effect, and it is the exception and not the rule to meet a considerate motorist. The Motor Act is thus inefficient because the conviction is generally that of the chauffeur, who is made the scapegoat, whilst the owner of the car escapes the publicity of conviction and merely pays the chauffeur's fine. An amendment of the law rendering the owner *primâ facie* liable to fine and imprisonment when his car has been driven contrary to the regulations (a liability only to be avoided by his proving he was not present at the time, and that his servant was acting outside the scope of his employment) would, in our opinion, have a most salutary effect in securing the safety of the public.

ALTHOUGH telephony is a subject of great practical importance, yet during the

last ten years there have been very few discussions on it at the Institution of Electrical Engineers. The rapid development of electric traction and power-transmission schemes, and the consequent problems which have arisen, are apparently the subjects which interest the great bulk of the members. The paper, therefore, on "Telephone Traffic," by Mr. H. L. Webb, which was read to the Institution last week, is a timely one. He points out that the study of the traffic is the most important part of the work of the telephone engineer. At an important exchange there are hundreds of thousands of daily telephone connexions

to be made, and each connexion consists of a number of operations made partly automatically and partly by hand. The object therefore is to arrange the positions of the apparatus and the manipulators so that the connexions can be made with the maximum speed and accuracy. He divided the history of telephone exchange working into two periods. During the first period extending over sixteen years the apparatus was mainly experimental. During the second period, covering the last eight years, the apparatus had been so perfected that it could be standardised. The working is now mainly automatic. The introduction of lamp signals was perhaps the greatest improvement, as they are extremely compact and have no working parts. They work automatically, as the signal disappears the moment the current is cut off. The introduction of this system of signalling has enabled the operator to deal with from three to four times as many calls per day as he could under the old bell system. One difficulty, however, has arisen owing to the great increase of telephone traffic which it was not easy to foresee—namely, that the fluctuations are more severe. The maximum "rush" of calls during the busy hour regulates the number of operators required, and so, in view of future developments, the study of this problem is of pressing importance. Mr. Webb pointed out the necessity of a training school for operators in connexion with every large telephone system. At such a school the apprentice learns more of her work in a month than she could in three months under the old system of letting her "listen-in" at a working position.

High Voltage Lamps. We have often pointed out the primary importance to the consumer of the electric light of the question of the efficiency of glow lamps. We congratulate the technical commission who were appointed last year to consider the future of the electric lighting in Paris on recognising this point, and on asking the Municipal Laboratory and the Central Laboratory at Paris to carry out independently extensive tests to settle this question. The results of these tests have just been published in the *Bulletin de la Société Internationale des Électriciens*, and they entirely confirm what we have said on several occasions during the last eight or nine years when the question of the change over from low to high pressure has arisen. The lamps experimented on were for 110 and 220 volt circuits. They were obtained privately on the open market from many makers, and the average results may be taken to represent the working efficiency of the lamps. The conclusions the Central Laboratory arrives at are that the 220 volt lamps are in every respect inferior to the 110 volt lamps. They are 75 per cent. dearer, and their efficiency when new is about 20 per cent. less. After burning 200 hours the average efficiency of the high voltage lamps is no less than 34 per cent. worse than that of the low voltage lamps. It is a pity that the tests were not carried on till all the lamps were burnt out, but the curves obtained show how the difference in the

* Nell' orto della Minerva vi fu trovata la statua della dea.

efficiency of the lamps goes on increasing. The results obtained at the Municipal Laboratory agree with the above. They found that the candle-power marked on the lamp was only a very rough measure of its luminous intensity, and they recommend that lamps should be marked in terms of the mean spherical candle-power. It will be seen that consumers who agree to change over to a higher pressure of supply have a right to expect a substantial reduction in the price of the current supplied.

No VERY drastic changes with regard to the treatment or taxation of alcohol for industrial purposes are proposed in the Report of the Departmental Committee on Industrial Alcohol recently published. Of most interest to our readers is, perhaps, the recommendation that ordinary methylated spirit shall, in future, contain only 5 per cent. of wood naphtha, instead of 10 per cent. With regard to the use of alcohol in lacquers, varnishes, etc., the evidence before the Committee as to whether the denaturing of alcohol with wood naphtha is detrimental to the lacquer or varnish or not was conflicting. The Committee state that specimens of goods treated respectively with (1) pure spirit, (2) ordinary methylated spirit, and (3) wood naphtha, were submitted to them, and that the distinction between them was scarcely perceptible to the unprofessional eye. The Committee consider that the existing regulations with regard to alcohol do not cause any serious embarrassment to the lacquer and varnish trade, except perhaps to the export trade. In the home market the trade enjoys protection owing to the fact that imported lacquers and varnishes containing spirit are charged full spirit duty on the quantity of spirit contained in them. The Committee show that the common assertion that the obstacles placed in the way of obtaining cheap and pure alcohol have been the cause of the coal-tar colour industry migrating from this country to the Continent is untrue. Such of the Committee's proposals as require legislative sanction will probably be embodied in a Revenue Bill.

AS WROUGHT-IRON has almost been superseded by mild steel, it is almost inevitable that the names of Bessemer, Siemens, and Martin should be familiar to the architect and engineer of to-day, and almost equally inevitable that the splendid services of earlier pioneers should be forgotten by the "professional man in the street," if we may be excused the term. Henry Cort, of Gosport, introduced the processes of puddling and rolling as long ago as 1783, and it would be impossible to enumerate in an adequate manner the services rendered by him to the iron industry of Great Britain. It is not generally known that Cort expended upwards of 20,000*l.* in perfecting his inventions, and that he was finally left to starve by an ungrateful country. Nearly fifty years ago Sir William Fairbairn stated that Cort "was robbed of the fruit of his discoveries by the villainy of officials in a high

department of the Government," and went on to show that the inventions to which we refer had even then increased the wealth of the country by 600 millions sterling, and found employment for 600,000 men. Various appeals to the public and the Government that the children of this public benefactor should be rescued from want met with no response, but a tardy recognition of his work has now been made by the placing of a memorial plate on the wall of the parish church of Lancaster, the town in which Cort was born. It is pleasing to note that this memorial is the joint work of British and American ironmasters.

Radiant Heat.

THE singularly mistaken view is sometimes expressed that a hot-water or steam radiator is of little or no value except for the purpose of warming air, brought into contact with the heated surface, by the process of convection. We have even heard a consulting engineer—who has been responsible for some extensive installations of heating plant in public institutions—state his belief that pipes and radiators give forth no radiant heat at all. While admitting the far greater radiating power of an open fire or a red-hot stove, we must point out that a very considerable proportion of the total heat given out by hot-water and steam pipes and kindred apparatus is actually emitted by radiation. Taking as a practical example the case of a horizontal 4-in. cast-iron pipe at the temperature of 200° Fahr. in air at 60° Fahr., the amount of radiant heat given off per square foot per hour is about 130 British thermal units, while about 120 units only are imparted to the air by convection. The precise results depend upon attendant circumstances, for the amount of heat emitted by radiation varies with the nature of the heated surface, and the amount of heat removed by convection depends upon the velocity of the moving air. When pipes or radiators are placed in a separate chamber and used for "indirect heating" practically no heat passes from the apparatus to the room to be warmed but that which is conveyed by the air. But when pipes or radiators are employed for "direct heating," more than half the total amount of heat evolved passes in straight lines through the air to and is absorbed by the walls of the room and by the persons, furniture, and other objects in the room. Thus the radiant heat emitted is of very great practical value, although its temperature may not be sufficient to scorch paper or to do away with the desirability of open fires in certain circumstances.

A Remarkable Building.

THE Leonardt Warehouse in Los Angeles, designed by Mr. L. J. Mensch, C.E., of Chicago, is interesting for several reasons. It includes the longest span concrete-steel roof girders hitherto constructed, the walls are built of concrete blocks—the newest form in which cement is applied to building construction; the sky-lights are of armoured glass, an excellent fire-resister which does not seem to meet with much more than theoretical approval in this country, and the roof girders carry

two suspended galleries 16 ft. wide, and calculated for a floor load of 150 lb. per sq. ft. While the combination of novel methods in this building is useful as an object lesson to conservative natures, the most noteworthy feature is the great span of the roof girders. The members are straight on the under side and the upper surface slopes up towards the centre, where the depth is 6 ft. 6 in., the width being 14 in., and the span 102 ft. The greatest span hitherto attempted in concrete-steel is less than 60 ft., and the girders here mentioned constitute a remarkable example of the adaptability of this material. Further, the whole building, with a floor area of 104 ft. by 150 ft., was completely built in less time than would have been taken by the preparation of the steel roof trusses originally contemplated. The concrete-steel girders cost a little more than the estimated price of steel trusses, but by the substitution of concrete blocks for brick sufficient saving was effected in the walls and footings to counterbalance the difference.

A Central House for Technical Societies.

IN the course of his presidential address to the members of the Iron and Steel Institute, Mr. R. A. Hadfield referred to a topic which has been the subject of discussion among engineers and others, namely, the desirability of providing a central meeting-house for various technical associations not possessing establishments of their own. For many years past the Institution of Civil Engineers have been hospitable enough to lend the theatre of their house to different scientific bodies, among which we may mention the Institution of Mechanical Engineers, the Institution of Electrical Engineers, the Surveyors' Institution, and the Iron and Steel Institute. Two of these associations now possess fine buildings, and a movement is on foot to provide another of them with a permanent home. The Iron and Steel Institute, however, appears likely to remain in a homeless condition, in company with many smaller but most useful societies. Mr. Hadfield's interest in the question is doubtless accentuated, and quite properly, by the impending removal of the well-known establishment in Great George-street, and it may be hoped that the desire of the Iron and Steel Institute for a general meeting-house will have the effect of arousing various kindred bodies to take the steps for the realisation of a commendable scheme.

The Society of Arts.

THE Council of the Society of Arts, at a meeting on the 8th, passed a resolution to the effect that in consequence of the feeling which has been aroused among some of the Proprietors of the London Institution in regard to the proposed amalgamation with the Society of Arts, they have decided not to attempt to go further in the matter. We from the first thought the proposed scheme a mistake, nor do we think that it would have been to the advantage of the Society of Arts itself, which has a history and a province of its own, quite distinct from that of the London Institution.

In the course of excavations for laying the foundations of some premises at George-street, in the vicinity of Crutched Friars, it is found necessary to destroy a portion, about 50 ft. in length, of the Roman wall which stands in the way of the new works. It is a piece of the later and outer wall which encompassed London in the 4th century, the construction of which is attributed to Constantine. As thus far we have the wall is about 7 ft. high and 8½ ft. in thickness. It presents the usual features of construction, consisting of a course of clay and flint upon the gravel soil, above which are three courses, alternately, of burned red tiles and rough-hewn masonry, set in cement. From the site we indicate the wall extended in direction almost due south to Postern-gate at the extremity of Tower-hill, and to the Thames-side, traversing the area now occupied by the Tower of London, where it passes just beneath the east end of the crypt of the chapel in the White Tower.

A FUND is opened for the restoration of the parish church of St. Mary, Brington, Northamptonshire. The church, which is mainly of the Decorated and Perpendicular periods, was enlarged in the earlier years of the XVth century by Sir John Spencer of Althorp, in the parish, who added the north chapel, chancel, and east tower of the nave; Frederick, fourth Earl of Spencer, added a bay to the chapel. The church contains the tombs and monuments of many members of the Spencer family, which afford an interesting study of costume and heraldry. Amongst them are the effigy of the tomb, in the chancel, of Sir John Spencer (obit 1522) and his wife Isabel, and one with recumbent effigies erected in memory of her husband William, Lord Spencer, who died in 1636, by his widow, the Lady Penelope. Two statues for the year 1638 in Nicholas Stone's MSS. account books relate to the latter monument: one entry is as follows:—"In 1638 I had a tomb for the Lord Spencer and his lady : : for the which I had very well payed me 600£." Walpole says that Stone paid John Hargrave (14£) and Richard White (15£) for the two figures. The monument to John, Earl Spencer (1783) is by Follekens, after a design by Cipriani. The monument of Margaret, wife of John, first Earl Spencer, has figures of Faith and Charity sculptured by Flaxman. In the floor of the chancel is the tombstone (1616) of Lawrence Washington, who removed to this parish from Sulgrave in the same county, and was the ancestor of George Washington. The bars and mullets in the coat-arms on the stone and at Sulgrave are, it is generally supposed, the origin of the national flag of the United States of America.

At the Fine Art Society's Gallery is a collection of beautiful water-colour drawings by Mr. Albert Goodwin, which are included on the catalogue "Water-Colours of the Cathedrals of England," but would be more correctly described for the most part as "Landscapes with

English Cathedrals Introduced." We see a drawing, for instance, of shipping in the dock at Gloucester (20), and between two masts we just discern a distant view of the cathedral; or we read "Winchester" (5), and we see a light-blue silhouette of the long low cathedral in the far distance. This last, however, is not a bad way of emphasising on the memory the peculiar long and low proportions of Winchester. However, this is a set of exceedingly beautiful water-colour drawings, with or without cathedrals as the principal objects. Among the finest are "Lincoln Cathedral from the North-West" (9), taken at the moment when the setting sun lights up the west front with the rich warm golden colour which the stone takes under that light—we are glad Mr. Goodwin has not missed that effect; "Wells—Parish Church" (21), where the church tower is one of the best bits of execution in the exhibition; "St. Paul's from Southwark Bridge" (81), with the proportions and outline of dome and western towers right for once (painters play sad havoc with them generally); "Durham Cathedral" (38), a drawing of exquisite delicacy; and "York Minster from the Walls" (42), where the battlements of the walls form a very bold foreground. There are a few strictly architectural drawings of interiors, but for the most part the interest of the drawings lies in their general effect as landscape compositions rather than as representations of architecture. Mr. Goodwin's method (of late years) of showing some of the architectural features in small (distant) views of architecture by thin pen-lines, in some cases certainly interferes a little with the aerial perspective of a distant building. The view of York Minster, by the way (No. 11), is wrongly described in the catalogue as "from the north"; it is a view from the south-east.

M. Lalique's Jewellery.

MESSRS. AGNEW have hardly done a kindness to M. Lalique, the eminent French artist in jewellery, by printing in the catalogue of their exhibition of his work the exaggerated and fulsome adulation of M. Gustave Kahn, who tells us, to crown the edifice, that M. Lalique's invention "can only be likened to the wealth of a great primitive art, teeming with songs that become legends, and which legends that in their turn become epics—voicing the great cry of inarticulate humanity." We read at the commencement of the preface of the artist's modesty, which would have induced him to dispense with any praise of his work in print; but a man need not be exceptionally modest to dislike having such bombast as this turned upon him, and we wonder that a firm like Messrs. Agnew's should print it. The true state of the case is that M. Lalique exhibits things (we do not know how many of them are made by his own hands) which show the most exquisite workmanship, but which are by no means in the purest artistic taste, consisting largely of the imitation of natural forms in precious materials. The result is a deficiency of the quality of "style." His "diadème" in case 3, for instance, is a beautiful piece of workmanship, but the lines are too angular—too much like intertwined sticks; and

this effect is worse in other cases, as in the "diadème" in Case VI., which has really no design, in the true sense of the word, at all. The diadème in Case I. is better, is a very beautiful and delicate piece of work; but it is not what a Greek artist would have produced with the same materials; the trail of naturalism is over it. The colossal grasshopper in carved horn, in Case II., is a monstrous thing, and repels one. There is a beautifully designed pearl necklace in Case V., and another nearly as good in Case VI.; but a large number of the objects, the rings and other things, are in very doubtful taste; too odd, too much like efforts to be original. It is very interesting to see such an exhibition, but we hope it will not influence English taste in any way. Our best artists in jewellery (we do not refer of course to what is made for the jeweller's shops) produce work which is in a better and purer style than anything we see in this exhibition.

PAINTING AND SCULPTURE AT THE PARIS SALONS.

By H. HEATHCOTE STATHAM.

THE first thing the visitor sees in the large gallery after mounting the grand staircase at the Palais des Arts is an immense painting by M. Detaille, divided vertically into three sections by pilasters, but in fact all one subject—"La Chevauchée à la Gloire," a crowd of cavalry soldiers of all uniforms, galloping on clouds in a composition forming a half circle, descending from the left, passing across the centre, and ascending again on the right, while at the top the visionary figure of "La Gloire" dominates the whole. This is a commission from the Government for, of all places, the apex of the Panthéon, once the church of Ste. Genéviève. I am neither particularly devoted to the Catholic church, nor do I think war an unmixed evil; yet to find what was once the sanctuary of a church for Christian worship decorated by a painting of a cavalry charge does strike one as a somewhat sad incongruity; nor can one avoid the reflection that the "chevauchée à la Gloire" has hardly done much good for France during the last half century. For the painting itself, it has all the mastery of movement of man and horse for which M. Detaille is famous, but it is hard and glittering in colour, and altogether hardly a satisfactory method of occupying such an immense wall space, independently of the other considerations above suggested.

Speaking generally, one may say that the Salon in 1905 is much where it has been for some years past; there are no new developments. There is a crowd of pictures which represent almost every possible view that can be taken of the objects of the art of painting—pictures decorative, illustrative, historical, social; landscape, genre and still life; many of them vulgar and commonplace, and some of the best men are not equal to their best; yet it is surprising to find how many really good works can be picked out from this crowd of canvases, when one gives oneself time to go through them with considerate eyes.

To look first at some of the names which are always prominent in one's memory. M. Gervais rather disappoints one with his "Dura Lex, sed Lex," an allegorical picture of the majesty and severity of Law, who is depicted as a female figure in a scarlet robe, flanked by figures of justice and mercy, and appealed to by a crowd who stretch out protesting hands against her stern decrees. It is a little far-fetched in sentiment and not remarkable for beauty. M. Henri Martin exhibits a decorative landscape for the house of M. Rostand the dramatist which is of singular beauty; figures play a more subordinate part on it than is usual with this artist; it is a hilly landscape cut by vertical trees in parallel lines, painted in this artist's usual *pointilliste* manner, which in itself removes the picture from naturalism into a decorative plane; and it is remarkable for its rich, full quality of colour. Two or three prehistoric figures with a goat pass across the scene, which is like

Deberque," which is as full of wind as it could be, and also shows very truthfully what painters do not always seem to notice, the dirty colour of waves during a storm in a shallow sea. There are many smaller landscapes that are worth looking at.

At the New Salon we are confronted also with the first room with a large decorative picture, Roll's "Joies de la Vie (Art, Mouvement, Travail, Lumière)," bought by the municipality for the decoration of some public room, and as far as it can be made out all as absurd a proposition as one could well see: a plain in the distance of Classic and Gothic architecture scattered with bits of about in the middle distance wind up a sunken road in the middle; on the three hantemen in scarlet coats gallop gallop on the right are various figures whose passions are unintelligible. The thing has a beauty nor sense, and one is sorry to see from M. Roll, who has produced some very good decorative pictures. In another room a section of a great decorative ceiling of the Théâtre Français by M. Besnard, Apollo et les Vingt-quatre heures." This picture of what is evidently a circular composition, the sun, behind the head of Apollo, makes a turning centre; Apollo's horses rear in the way of the sun, and the Hours appear hovering amid concentric circles of light of increasing brightness towards the circumference. The painting is treated in the way of a tapestry; that is to say, it is kept together and floating in effect, and it may look new in its intended situation than it does on a wall. In Gallery X there is a small collection of more satisfactory decorative paintings. "Pantheon Decoratif" for the Lycée Rolland is a bright landscape representing a group with a line of joyous figures coming up to the foreground—a very charming example of decorative painting used in a decorative manner. There is also here M. Friant's fine ceiling for the theatre of Meurthe-et-Moselle, representing as Lorraine Protectrice des Arts et des Sciences. This is one of the ceilings treated in an upward perspective—a violoncellist fore-grounded on one side, an astronomer and a philosopher fore-shortened on the other side, the rest of the composition being filled with figures floating in the air. The principle of treating figures in upward perspective is not a good one, and in its main design this is a fine work and essentially a ceiling painting, not a wall-painting placed horizontally; very different with respect from M. Gervex's "Étude pour Plafond de la Mairie du XIX^e Arrondissement," in which two classically draped figures are about to open a wall, which wall will of course appear horizontally on the ceiling, and the idea that it must fall on one's head.

The eccentricities of the New Salon are rather than over, and include things, like the ceiling by M. Willette and M. Zuloaga, which represent the lowest degradation of the art of painting, though these things find admirers among the class of critics who find everything in the Old Salon bad and everything in the New Salon admirable. Yet the New Salon stains what, as a piece of painting, and even in the matter of expression also, is certainly one of the finest French pictures of the year—M. Carot's-Duran's "Volupté." He at least paints, and though this picture would not commend itself to parents and guardians in England, it is the one work in the New Salon which it may be said that is in itself worth a visit to the exhibition. But the proportion of good work is really very small, and some of the best men are not up to their usual mark; M. Béné's series of small landscapes, for instance, is by no means equal to what I have seen here in former years. Among a few notable pictures there is a good one with a moral to be drawn by a Chilian artist, M. Arce, "L'Amour et la Charité," a diptych, one side illustrating penitential giving of alms in the street by a lady, the other the visit of pure sympathy to the part of a young girl to a sick woman; a later is a beautiful piece of pure feeling, "L'Amour et la Charité," a small picture in which a nude figure sits half lighted by a stained glass window, an unusual and very original production. Dagnan's "Le Calvaire" is a fine little scene of a cross on a sea-coast cliff with a man and infant seated by it; a picture with a moral in it, M. Flourie's "Avant le Bain" is a successful treatment of a nude figure in

open air and lighted by flecks of sunlight through the trees. M. Lagarde paints a scene in a battered city street in winter, "Soir de Guerre," with dead soldiers and horses lying about, which has been bought by the State, but whether to encourage or to repress the warlike ardour of good citizens is not obvious. M. La Touche, amid some not very interesting works, impresses one with "La Bourrasque," the making up of a quarrel between husband and wife, which is touched with real pathos. M. Lavery's "Polymnia" looks as well here as it did in the New Gallery, and Mr. Sargent's "Portrait of Mme. la Duchesse de S—" better even than it did in last year's Academy, being in a more favourable light. M. Lhermitte, in "Chez les Humbles" has played what is now the somewhat worn-out trick of introducing the figure of Christ among personages of modern life—in this case blessing the meal of the poor; the feeling of the work is pleasing, but the colour very dingy; a quality, however, which is a note in the prohibitions of the modern school, who must paint everything in browns and greys. The State has purchased M. Ménard's "Temps Calme," a little sea-piece with a small ship becalmed on an expanse of sea. Mr. Stewart, one of the French-American colony of artists, paints a moral picture under the title "Redemption," in which the point is the sudden reflection and disgust of a much-dressed young lady in the midst of a party of very noisy cigarette-smoking fashionables; the point is forcibly made, but after all it is of more interest for the moral than for the art. M. Weerts's picture of "La Bella Simonetta," a half-length nude figure with her back to the spectator, looking out into the sunshine, is one of the few works of its class in the new Salon which can be called really masterly, and by pure force of painting is in a different category from the numerous figures, catalogued indifferently as "Avant le Bain" and "Après le Bain," mostly of little interest except to show that the artist can draw the figure.

It is not a great year in sculpture, comparatively speaking. There are in the great court of the Old Salon, no doubt, many finely modelled figures, but one does not find any work which can be called really memorable; any of these conceptions which strike one for their intellectual interest as well as for their fine execution. The most individual work is M. Mercier's monument to Armand Silvestre; a broken off column around which circle three nymphs in bas-relief (small scale), while a fourth figure is seated in the rear of the column. Of this we may possibly be able to give an illustration. M. Lombard exhibits a heroic size monumental statue of Pierre Puget, mallet and chisel in hand, and an unfinished figure by him. There is a large fountain by M. Belloc, "Le Printemps et Bacchus," for a square at Perpignan, a little too restless in design; a pretty monument by M. Bernstaum to the author of "Le Monde où l'on s'Ennuie," in which a girl wreathes with garlands the stele bearing the bust of the dramatist; a fine kneeling figure of a Bacchante by M. Charpentier; M. Derré's "La Grotte d'Amour," a very impassioned group, purchased by the State; a statue of Krisis decking herself with the ornaments of Aphrodite, by M. Laoust, noticeable because it is really the perfection of elegance and finish of design, though rather too "pretty"; M. Lefebvre's personification of "L'Été," by a figure of a modern lady in a broad-brimmed straw hat, which he has really managed to make quite sculptural (this is a Government Commission); M. Peynot's "Poésie Pastorale," a fine and poetic production; and M. Theunis's two large monumental figures representing "Le Seine" and "L'Escaut," reclined on lofty pedestals, and which are intended to decorate the bridge of the canal at St. Quentin. In fact there is plenty to look at in the sculpture, only nothing of such high and special interest as I have found in the central court of the Grand Palais in some previous years.

EDINBURGH ARCHITECTS AND THE PARISH COUNCIL.—At a meeting of the Council of the Edinburgh Architectural Association, held on the 11th inst., the terms and conditions upon which the Parish Council propose to elect an architect and superintendent of works was under review. On the ground that the remuneration offered was far below the recognised scale of professional charges, the Council of the Architectural Society expressed disapproval of the same, and resolved to communicate with the Parish Council on the subject, and to ask them to reconsider the conditions of appointment.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE usual fortnightly meeting of the Royal Institute of British Architects was held on Monday at No. 9, Conduit-street, W., Mr. J. Belcher, President, in the chair.

Sculpture in Relation to Architecture.

The Chairman announced that Mr. A. Gilbert, R.A., and Professor Lanteri, who, with Mr. T. Stirling Lee and Mr. W. Reynolds-Stephens, had promised papers for that evening, were unable to be present.

Mr. T. Stirling Lee said he had not expected to be the first that evening to be called upon to speak, but he wished to express the great pleasure he felt in being present, for under their late President and the present Chairman sculpture and architecture had made great progress. One wished first of all to ask what was this great desire they all had to express themselves in figurative language? From the very earliest time man had desired to express his thoughts in form, and in his tombs and temples had taken sculpture as the language. The great ideals of their old world have been written in that language, and what would they have lost of the thoughts of the Egyptians, Greeks, Romans, and Florentines if sculpture had not been associated with architecture? Architecture was the most open of all books. There it was in the streets for everybody to see, and the sculptors wrote their thoughts on these buildings in figurative language. Any sculptor who had to do anything with a building could not approach it except from the point of view that it was the highest sphere in which he could use his art. He had got to hand down to future ages the thoughts of his time, and one did feel in this sense that every sculptor ought to be a very deep thinker. He must be, and must always have been, a deep thinker. The sculptor had to observe nature very closely because he was going to use these symbols and their characteristics in his language, and he had to hand down the environment in which he lived. From those things he could come to the present day, and he would ask whether we, as a nation, understood the figurative language? Did we, when we put sculpture on our buildings, really grasp the fact that we were putting on a language which was going to be read and understood by the public? Was the figurative language or symbolic language a living thing to-day? After they had put all their observations of nature into their work, how many of the persons who went by would stop and read it? And yet that was the use of sculpture in architecture. One went to work with great ideals, and had a longing to express—whether religious views, scientific discovery, the attributes of good government, the virtues, or the literary arts and sciences. They took them all as their subjects, but how real were they to the sculptor to-day or to the public in the sense of a figurative language? In the old days there were no books, and people illustrated their thoughts from nature, and their touch with nature made the language of the sculptor intelligible to them. That they had lost that there was no doubt, and to a great extent they had lost the use of that language on their buildings. Now they came to the other side, which was the aesthetic side. Here they came to a thing which must always exist as long as architects would use ornament as part of their scheme of design. Then came the highest form of ornament—that of masonry; because from the very first association with architecture the sculptor had got to realise that his carving was masonry, and that it was to be part of the building. The first thing the architect desired was to use the highest form of decoration—the human figure; but he supposed he was right in saying that the first thing those who employed the architect knocked off was figure sculpture. He would like to know if ever there was an architect who had a free hand to use what he wanted. No doubt, however, it was the desire in all designs to use that highest form of decoration, the human figure. And then the sculptor had to consider what was the idea in that part of the building he had to decorate; what lines he had to carry through; what proportions of light and shade he had to carry through; what was the scale; and what was the sort of proportion the architect wished in his design. Sometimes the building might want flowing lines, and these lines must be in the sculptor's panel. He would like to show how wonderful these lines were to anybody who really thought out his art with architecture.

Every problem that he ever came across in architecture was found in the Parthenon, and so he would illustrate what he meant by that building. The Parthenon frieze was a wonderful illustration of the treatment of line. There was one panel which puzzled everybody, because one figure was deeper in its relief than any other. It was the last panel but one in the frieze, and it was not until they had got these panels all put together that they found the reason for it. It was simply the point of view of composition of line. The whole frieze was carried round and the sculptor wanted to stop, and he did it by carrying the lines of the sculpture and the architecture down the building. The whole thing was one beautiful continuity of line and composition, and showed how marvellous the Greek idea of line was, for even the heel of the boy in the panel was part of the composition of line. Now he came to the point of view of light and shade. The light and shade of anything when they had to do with architecture was governed by the light and shade of the mouldings, and in the frieze they found the depth of the relief was governed entirely by the light and shade of the mouldings. The panels were all within a plane. So wonderful was the way in which the Greeks studied the law of optics that if they got an angle under the colonnade and looked up they might take a straight edge from the point of view they were looking and would find that the whole of the composition was covered from that plane. Everything seen at a distance must be governed from the point of view at which it was seen. Then they came to the point of view of impression, and to show how the Greeks thought deeply, and how they associated light and shade, he would refer to the Phidias' "Birth of Athena." Here the sculptor was going to illustrate the birth of "Wisdom," and how was he going to do it? Wisdom was born with the sunrise, and so the sculptor illustrated the light and shade of the day. He started with the rise of the sun, went on to the full daylight with the sun at its meridian, and closed with the twilight of evening. That was the sculptor's idea, and it was perfectly right. They knew that when some of the people saw the figures in the studio they asked the sculptor what he had done, but they knew what it looked like on the Parthenon. The one idea of Phidias was to illustrate his light and shade scheme, and they could see how the poetry of thought entered into his scheme. Then they came to the question, "Can you get in one flat plane the effect of anything like perspective?" Phidias wanted his deities seated in a semi-circle, and how was he to get it? If they went to the Parthenon Room at the British Museum and stood at the further side to look at these deities they would find, by the way he treated his chairs by cutting them in one plane, and the way he treated the angle of these chairs, that at a distance the deities formed a semi-circle. It showed how wonderfully the Greeks thought. Again, in the presentation to Athena they saw how gradually Phidias diminished the figure so that it seemed to rise from the earth. He mentioned all this to show what could be expressed in sculpture on a temple or public building or whatever it might be. Another wonderful example of the treatment of light and shade was to be found in the panel by Phidias of the white cow. In this panel they saw the influence of the architect, the sculptor, and the painter, and it was one of the most wonderful pieces of carving in the whole of the frieze. They were often laughed at when they talked about colour in sculpture, but all he would say was that if one felt colour it governed one's treatment of a subject. He had tried to illustrate how first thought governed them, and then how line, general proportion, light and shade, and even impressionism governed them in relation to their work in architecture, and now he came to the practical side. Mr. Lee proceeded to describe from photographs the different methods of work by Phidias, Michael Angelo, and Giotto, and remarked that everything to do with architecture must have proportion with the lines of the building if they were to have harmony. But what was their position that night? They had to deal with two classes of sculptors—one the plastic and the other the glyptic; the one was a modeller and the other a carver. The carver was one who served his time in a shop and went out and carved in stone; the other went to schools and put his clay up and gradually went on to work it. With architecture they must work with the carver. If they were to do anything with architecture at

all it must be from the geometrical side, and if they wanted an example of what he meant he would ask them to put a modeller on a building. They would then find the thing full of black and white, but there would be no surface plane. Directly they put a man on stone he would not take off more than he could help, but would leave the stone part of the building. A very serious thing for England was that they had very few carvers, and they were doing less and less of their own work. He believed that if a man was going to put sculptures on a building he should do it *in situ*, and he should go with the one idea that his work was part of the building; he ought not to take a modelled figure and put it on a building. It was said that this method of working would take too long, but he did not think so. The man who understood carving would get his design and line it out, and after getting the rough coat off would come and put his own work on it, and if he did that he would be quicker than the man who modelled the figure and got it carved by someone else. They must come back to the first principle that sculpture and architecture must work together, and that the sculptor must come with the idea that he had to enrich architecture.

Mr. W. Reynolds-Stephens said he was glad that Mr. Lee and himself, who worked so differently, saw so many things in common. To him architectural sculpture fell under either of two heads. First, constructional sculpture, or that which was formed out of a piece of the structural material of the building, and which actual piece had to perform its original purpose as weight-bearer or receiver of a thrust, such as columns, caps of columns, keystones, corbels, brackets, and the like. Secondly, there was the applied or superficial sculpture, under which heading he placed niche figures, the filling in of spaces such as spandrels, panels, and friezes, also mere surface work upon walls, and other structural features. In both classes fitness for its purpose should be the greatest quality of the sculpture, and in its quality of fitness beauty stood supreme. Unless the sculpture added beauty to the building it had no logical reason for its existence. The time when its chief object was to record history was now of the past. In structural sculpture the absolutely essential requirement was that it not only aided, but also appealed to the eye and brain as aiding, the building material to do its work, be that work either support or resistance. How frequently one received an impression of weakness owing to the unfortunate selection of lines and masses even if an actual serious weakening of the material was not there. Yet they had the magnificent results of the past to refer to. Of these he placed first the Caryatides of the Erechtheion. Every line of those figures was designed to aid the impression of carrying; the very selection of type of person, the restraint from all suggestions of movement in the pose, they stood there as if nothing could tire them, but yet as if they felt the responsibility imposed upon them; but then the architect had not overloaded them with work, the bulk of building they carried being reasonable. How different were the couple of crouching figures one frequently saw nowadays, struggling under a load of 30 ft. or more of bay window. Another example which had always given him the greatest satisfaction as structural sculpture in conjunction with architecture was the winged Assyrian lion, which formed the base of each pier of some king's doorway in Assyria, and which was now in the British Museum. The great wings, folded back tightly against each side of the pier, created the impression that they were there to hold the wall safe from lateral movement. The great lesson to be learned from thoughtful analysis of the works of the past—from their mistakes as well as their successes—must result in the appreciation of certain laws which should guide them in their present work. No one regretted more than he did the repetition of those works in the present, for he felt that, whilst the laws of fitness which the old sculptors established beyond question should be followed, yet the thought and feeling should be entirely of our own time. That was the only way to have living sculpture, but generally it was merely a resuscitation of dead bones that was introduced. He would like to know how they, as architects, thought of a matter which always worried him in certain examples of Michael Angelo. He referred to the placing of the four lying figures on the tombs of Lorenzo and Giuliano de Medici. On him the impression was created that each block of white marble of which the figure consisted was slipping

sideways off the architectural base. One point where they might avoid following a rule of the past was the placing of the figures showing no appreciation of the laws of gravity. In their paintings artists had long ago abandoned the faults of the painters who knew nothing of perspective, but in architecture one saw figures after figure reaching out and pretending to carry a mass of material when in reality the material carried the figures. In the avoidance of this mistake Alfred Stevens was not happy; he obtained great richness of light and shade, and yet he did not exceed the limitations of the possible. If a figure projected beyond the limits of gravity another figure was sure to be behind holding it back. With regard to the second head, applied and superficial sculpture, he felt that in respect of the mere surface ornamentation of walls the most fitting work was that which was incised work, the incision of the surface of the wall being recognised as the main characteristic in the treatment. He referred to the Assyrian bas-reliefs of the lion hunts of King Assurbanipal, in which he felt the treatment of the animals placed these bas-reliefs as being the finest things of their kind in the world. Before leaving outside work he would venture to express regret at the large amount of money spent on sculpture which was wasted owing to the placing of it apparently without regard to the neighbouring houses and to the width of the streets. How often was the sculpture only to be seen properly from the attic windows of the opposite house? He supposed the Greeks started the fashion for friezes, but then buildings were always longer than they were high, which was seldom the case in towns now, owing to the great value of land. These Greek buildings could be seen at some distance, and the scale of the figure work and of relief they adopted told well in their strong sunshine and clear atmosphere, and was not of necessity suitable here under such very different conditions. He was going to refer to a definite example of the misuse of sculpture in a new building in the Strand, but perhaps it was better that he should refer to an example of a building which probably most of them knew, and in which he felt they had a real fitting way of treating the sculpture. He referred to Colney Chapel, at All Saints' Convent, St. Albans, by Mr. Leonard Stokes. It was a site which would inspire any sculptor to do his best, and he thought that Mr. Wilson in his sympathetic work had not wasted his chances, with the result that the sculpture did really add to the beauty of the building as a whole. He felt that many British architects were to be congratulated on their appreciation of the necessity of protecting outside sculpture somewhat from the stress of the weather. Much of the modern French work was wrongly treated in this respect. It seldom had any moulding or coping above it, and, in fact, the architect seemed to select the skyline and the most exposed part of walls for decoration with sculpture. He mentioned that because one saw buildings cropping up in London from time to time in which French influence prevailed, and although they should be ready to welcome any good influence, yet they should look critically into things and make sure that they were good. They cordially acknowledged the good influences they had received from their French brothers in art, but it was no complaint to them to receive everything without question. This question of the wear of water and frost was one too frequently lost sight of by sculptors, and a recognition of it should be insisted upon by architects for their stone carving. It was a thing the old mediæval sculptor understood so well, and the great use they made of vertical lines was in great measure the outcome of necessity. It was not only an eye of beauty which dictated it, but practical requirements as well. With reference to the treatment of material as affecting both inside and outside work, he believed that one of the great defects of their British school of sculpture was the quite secondary place given to the consideration of the material in which the work was to be finally produced. The design and modelling was in most cases the only thing seriously considered. Slavish imitation of a model and shyness in use of the clay appeared to be all-absorbing. When sculpture was applied to architecture, and more particularly when it was for structural parts, he felt the treatment of material was all-important. In their school training this matter was practically excluded, and he thought that architects could render a real service to British sculpture by emphasising

The Chairman said that he felt bound to say that the sister arts of sculpture and architecture had drifted apart, and he thought that architects were somewhat to blame in the matter. He trusted that in the future the two arts would be brought closer together and would work together from the beginning. They must not forget that they were sister arts, and that architects must not allow sculpture to be used improperly or to serve merely as pinnacles and terminals or to add weight to the top of a buttress. It was on that account that they had drifted apart. He knew a sculptor who said to him on one occasion, in speaking of his pedestal: "I do not want any architecture because it detracts from the figure; I prefer to place it on a rough-hewn block." Just as architects had begun to learn the uses and advantages of sculpture in relation to buildings, so he hoped that sculptors would learn that architects could be of great help in aiding sculpture. It was true in the case of buildings the architect must take the lead, and the sculptor must follow him; but in the case of monuments, where there were groups of figures, then the architect might well come in and help the sculptor by making a shrine for his work—for making a setting to the jewel. As Mr. Lee had remarked, sculpture had a special tale to tell; it had to endeavour to tell some story, or to give some illustration or some information with regard to its purpose. A building also had a tale to tell and a message to deliver, and architects asked the sculptor to come in and help them in the expression and in the carrying

on of the tale, as it were. His views were pretty well known on that subject, but he would like to give expression to one or two thoughts. One was that architecture dealt with straight lines, and sculpture with round lines, and it was the contrast of the beauty of curved lines against the perpendicular and horizontal which helped on their work. There must be a certain balance and uniformity in their work with regard to buildings, and he also thought that scale was very important—much more so than had been stated that evening. He thought it was important where two or three sculptors were working together that the scale of their figures should be in proper relation to each other. He was not speaking of separate panels or subjects. He did not consider that in that case sculptors helped the architects at all, for the subject might not be connected with the building, and the architects, then, only provided a frame for the subject. Where a sculptor could help an architect was in the expression of the purpose of the building itself. Relief also was a most important matter that had to be considered. Relief work stood in sculpture something like decorative work in painting, and he felt that relief work was the most important means the sculptor had of helping them. Figures in the round had perhaps a more distinct message, but they should place them in a proper position where they could deliver their message. Whether they were in the round or in relief a great thing was that they should be part of one subject.

The vote of thanks was then agreed to. Mr. Stirling Lee, in reply, said it was only by interchange of opinions that they learned, and there was no doubt that sculptors did have a great deal to learn from architecture. He could quite understand that remark of a sculptor which the Chairman had referred to, because they knew nothing about architecture. If a thing was to be perfect the base was quite as important as the figure-work, and it was owing to the lack of architectural knowledge that they were doing such bad public statues—they were individual statues, but they did not fit.

Mr. Reynolds-Stephens, in also acknowledging the vote of thanks, said he felt that if there could be co-operation from the beginning of a building design it would be an absolutely ideal thing, but that would never come about with their present system of education. It was his only grievance against his old school of the Royal Academy that he was not obliged to learn architecture as a sculptural student. If every sculptor was obliged to study architecture the advantages would be manifest, and he felt that architect students, with great gain to their professional work afterwards, should study and appreciate the aims of painters and sculptors.

The Chairman announced that the next meeting of the Institute would take place on June 5.

THE SURVEYORS' INSTITUTION.

An ordinary general meeting of the Surveyors' Institution was held on Monday at No. 12, Great George-street, Westminster, S.W., when Mr. J. D. Wallis read a paper on "The Licensing Act, 1904." The author dealt with the general position before the Act, the grounds on which licences can be refused without compensation, renewal authority, and the compensation authority, the compensation fund, the procedure for fixing the compensation, the basis for compensation, the value with the licence, the value without the licence, the division of the compensation, new licences, the monopoly value, and comparison of compensation value and monopoly value.

In speaking of the value of the premises without the licence he said that the valuation of the premises, as if they were not licensed premises, would bring in a number of considerations, varying in each case, but would nevertheless be a matter well within the experience of most surveyors. The principal point to consider would be what value they have for other purposes and how far they are adaptable or suitable for other businesses. In the majority of cases licensed houses (except the old beerhouses) had been specially built for the particular trade to be carried on, and in many cases the buildings would have little value for any other purposes, in fact the larger the house and the better equipped for its purpose, the less value, comparatively speaking, it would have without the licence. In the large towns many imposing and expensive structures, with elaborate fittings and fixtures, would become almost worthless, whilst small beerhouses and many country inns might more readily find a

use (of course at a much lower rent) either for ordinary dwellings or for other purposes. The difference in value between the premises with a licence and without a licence would, no doubt, be very great. This would be so even in the case of a small beerhouse, as, in such places, the amount of trade done was frequently very large in proportion to the amount of accommodation, and instances could be quoted of houses let at rents of from 200*l.* to 300*l.* a year, which, without a licence, would let only as small dwellings, or possibly for shops, at not more than from 20*l.* to 40*l.* a year. In many cases the difference would not be so great as this, and each case would, of course, have to be dealt with on its merits, taking into consideration the best possible use to which the building could be put and the best rent obtainable for it. The multiplier to be applied to premises without a licence would be less than in the case of a house with a licence, this being another factor causing a difference in the valuation. For instance, a public-house with a licence might be worth 200*l.* a year, which, if taken at twenty-six years' purchase, would give a value of 5,200*l.* Without a licence, the building might be worth 100*l.* a year, but this rental could probably not be taken higher than the 5 per cent. table, or at twenty years' purchase, which would give 2,000*l.*, a difference in capital value of 3,200*l.*, but in annual value of only 100*l.* It was not clear how far the question of site value, apart from the value of the premises, could be considered. Some licensed houses, in commanding positions in the centre of large towns, would, if devoted to other purposes, be of greater value than as licensed premises; that was to say, it would pay the owner to forfeit the licence, to pull down the house, and erect on the site shops and offices, or flats. In such a case compensation would probably be claimed on the ground that the premises, having lost the licence, would be reduced in value. Such examples were comparatively few in number, but the question of site value was an important one; the instance given being but an extreme case intended to illustrate the principle. To the compensation had to be added the amount of depreciation of trade fixtures. This would, in most cases, be the difference in the value as fixtures used in connexion with the premises as a going concern, and the value for breaking up purposes, or for sale at auction prices.

Visit to Exeter.

On the 25th and 26th inst. the Institution will hold meetings in Exeter, when papers will be read and visits made to places of interest.

MAGAZINES AND REVIEWS.

In an editorial article under the title "The Reform of Municipal Architecture," the *Burlington Magazine* supports strongly the protest recently made by the Institute of Architects against the employment of official surveyors and engineers to design municipal buildings. The article entirely repudiates the criticism sometimes made that the architects are consulting their professional interests in the matter. As a fact, it may be to the interest of architects to be employed in such cases, but that, the writer urges, is not the point for the public to consider. What they have to think of is the opportunity of getting the best architecture in their public buildings, and that is not likely to be got from municipal officials. The article concludes with an application of the argument to the case of the proposed London County Council Hall, recommending (as we have already done) an open competition. In the same issue a writer who signs "P. A." contributes what we think a very wrong-headed article under the title "The Failure of our Water-colour Tradition," the gist of which is that pure water-colour must always be and has always been a comparative failure, and that there is no chance for water-colour except with the aid of body-colour and "wiping out." With these means "it can rival oil painting in strength and splendour." To which we reply that it is not meant to rival oil painting; it is a perfectly different art, and the old tradition was the right one.

The *Art Journal* commences with an article on "The Chantry Gallery as it should be," giving a list of illustrations of works with which "an ideal Chantry gallery" should have been commenced. The list as a whole does not commend itself to us as an ideal. The writer of the article seems to think that the object of the Chantry collection should be the illustration of the newest developments in English art. Those

should be included, no doubt, but his position is not central enough. A representative Chantry collection should be founded on the works of the established and recognised leading artists of the day, not on exceptional works, however clever; and, in spite of some mistakes which the Academy Trustees have made, we are inclined to think on the whole their guidance is the safe one. We do not want a Chantry collection of "new lights" in art.

The *Architectural Record* (New York) contains an article on "A New York House of To-day," that forming No. 50, East 22nd-street, New York, of which Mr. J. H. Freeland is the architect. The elevation seems to us to have the worst qualities of a modern French street house without its refinement; but the interiors are much better, and the subject is certainly of interest to English architects. A long and fully illustrated article on "The Clateau de Langeais," by Mr. F. Lees, forms the most important and valuable portion of the contents of the number.

The most important article on *Public Works* is a long and fully illustrated one on "The Dover Harbour Works," by Mr. A. T. Walmsley, the engineer to the Harbour Board. The number includes also an article on "A Great Indian Reservoir," that of Marikare, in Mysore, by Mr. R. B. Buckley, late Chief Engineer of Bengal. There is also an article on "The Repair, Straightening, Raising and Falling of Chimney Shafts," by a special correspondent, and one on the construction of "Cast-iron Tanks," by Mr. W. J. Jones.

To *Technics* Mr. Bryson Cunningham contributes a short article on "Concrete," the most useful part being that in which the writer deals with some essentials governing the proportions of its constituent materials. It is unfortunately the fact that the composition of concrete is often settled in a somewhat haphazard manner, and specifications are by no means uncommon in which no attempt is made to define the relative proportions of the sand and aggregate, and in which the importance of filling the voids in the latter appears to have been overlooked. The writer takes the only correct view, that the sand and cement should be regarded as mortar, the function of which is to surround the stone or other material employed as aggregate, much as ordinary mortar is used in the interior of brick and stone masonry. Two important postulates stated are that cement and sand mixed with water diminish by about one-third the joint bulk measured dry before use, and that gravel and broken stone also occupy less space when mixed than they do apart. The bearing of these points on the determination of the proper proportions of concrete is then explained in a manner that should be helpful to young architects and engineers. While emphasising the importance of mixing, the writer does not mention the admitted superiority of mechanical mixing, and is extremely remarking that "in extremely delicate takings, concrete is more economically mixed by the mechanical appliances." In our opinion the greater efficiency so secured is of far greater moment than economy, and as concrete-mixers can now be obtained in all sizes, their use ought to be regarded as imperative in all building operations. With regard to the quantity of water, the writer's opinion is in favour of fairly wet concrete is one we quite agree with. The article concludes with a few data as to the strength of concrete, and serves the purpose of directing attention in a general way to some of the practical points connected with the preparation of this valuable material for construction. "Steel Purlins for Corrugated Iron Roofs in Theory and in Practice" are discussed by Mr. E. Fender Echells, a.M.I.Mech.E., his object being to effect a compromise between practice, as represented by the "old workman," and theory, by "the young theorist." Having shown that in roofs capable of withstanding the gales of years the calculated stress on steel purlins may be as much as 50 per cent. in excess of the actual breaking strength of the material, Mr. Echells states some new rules applicable to all ordinary cases of purlin design. These formulae, which are adopted, but they allow more latitude and are more rational than the common method of computation, in which the various assumptions usually made give rise to the considerable divergence existing between practical and theoretical views as to the design of the members here considered.

In the *National Review* Mr. D. S. Macoll moves the attack on the Royal Academy which is now the fashion, under the title "The Royal Academy and National Art," the inference being, of course, that the Royal Academy does not represent national art. To which we reply that at all events it represents it much more than any other English Society existing. Mr. Macoll's programme evidently aims at disestablishing the Academy altogether, in which we do not think he is likely to succeed. The chief fault of the Royal Academy, in its corporate capacity, lies in its attitude of superiority to all criticism, and refusal to give reasons or explanations for any of its actions. Many Royal Academicians are personally most modest and amiable men, but the tradition of the Academy as a public body is to ride roughshod over every one who differs from or criticises it, and there is where it makes enemies.

The *Nineteenth Century* contains an article by the Editor of this Journal, intended for future-seers and not for artists, on the question "What are Pictures For?" which, we may take the opportunity of saying, was the original title of the article; the modification of the title by the Editor of the Magazine into "What is the reason of the Pictures?" by no means commends itself to the author of the article.

In the *Century* we have again the Château de Langeais in the course of an article (the original on the Château de Touraine, by Mr. Fritling, who deals in this issue with Loosely and Langeais). The article is, of course, merely literary, but the illustrations, from "colour drawings" by M. Jules Guérin (that is, we take it, drawings specially made for reproduction in colour), are very fine and effective.

Harper commences with an article by Mr. Robert Maundrell on "Magnetic Storms and the Sea," including an interesting description of the "Magnetic House" or "magnetic observatory" at Greenwich, installed in 1838 for the continuous registration of movements of the magnetic needle. Mr. Jacques de Morgan, Secretary Director-General of the Antiquities of Egypt, contributes an article on "The Temple at Susinak," being the result of the excavations at Susa. He describes in detail the bricks used, without mortar, and with hand-written inscriptions often on their ends giving the name of the king who made the building, and other information in regard to it. The bricks found in the temple of Susinak are, we are told, would furnish a complete list of the Elamite kings. Illustrations of some of these inscribed bricks are given, and a number of ornaments found in the ruins. A short article on "Subiaco" by Mr. W. L. Stone gives a description and illustrations of what must be one of the most picturesque places in Italy.

In *Scrutator* an article entitled "The Marble Mountains," by Mr. E. B. Child, gives a very interesting description of quarrying in some marble quarries in the United States, we do not exactly make out where, except that the Green Mountain "is one of the localities named." It is accompanied by most effective illustrations in colour. "Over Night at the Edge of the Grand Canyon," (it used to be spelt "Cañon"), by Mr. Benjamin Brooks, is accompanied by illustrations of what appears to be some of the most extraordinary rock and mountain scenery in existence; the six or seven photographs are well worth attention; we say what one might fancy the scenery in a dream to be like.

The *Antiquary* contains an article by Mr. William Martin on a subject likely to be much under consideration at present—"The Law Relating to the Protection of Ancient Monuments and Buildings"; an answer to the question so frequently put, "a new form or another, by the owner of such a monument—May I not do what I like with my monument?" The article is to a great extent a sound of the existing law on the subject, but contains also important suggestions (with which we are quite in sympathy) for extending and amplifying its powers of interference with those who possess remains that are of historic value to the nation. "The other end of the walking-street," by Mr. Francis Abel, is an interesting article describing the vestiges in the north of England of the Roman Road which traversed under that historic title in London. The *Gentleman's Magazine* includes a short article by Mr. W. Peley on "Passenger Traffic on Canals," a brief sketch of the history of the subject, and of travelling on canals in the days of the railways.

EMBROIDERY AT THE BURLINGTON FINE ARTS CLUB.

THE Exhibition of English Embroidery executed prior to the middle of the XVth century at the Burlington Fine Arts Club, Savile-row, is unique of its kind. The thirty cases of exhibits worthily represent the art of embroidery in England of mediæval times. English embroidery among all the arts stood in most repute; it was specially valued abroad, many of the finest specimen pieces finding their way across the seas. The term *opus anglicanum* is found in French, Italian, and Spanish documents, denoting not only the country that produced the work, but indicating also its value and excellence. Documents show the astonishment of the Normans at sight of the splendid state robes worn by the Conqueror and his chief nobles on his return to Normandy after his conquest of England. At Durham Cathedral there are fragments of beautiful and skilful work of Anglo-Saxon times, of which photographs are shown at the exhibition. The fragments are of great beauty in design; the colour is unrecogisable. They must be the effect of an existing tradition or school of work of which there is no trace. The art was fostered by the religious houses, and the exhibits shown are nearly without exception of ecclesiastical character. No doubt ecclesiastical vestments were more carefully preserved than lay garments, and it was, besides, the custom of the wealthy and noble to present their splendid robes of ceremony to the religious houses, to be turned into altar frontals, copes, and chasubles. The art was practised by men and women, and was greatly favoured by royal ladies; at the beginning of the Xth century Edward's Queen Aelflæda produced the fragments alluded to at Durham Cathedral. As in the other arts, the high-water mark of excellence in English embroidery was reached in the later part of the XIIIth century. Compare the painted photographs 1, 2, and 3, the Ascoli Cope, the portion of the Toledo cope, and the painting of the cope with the "Tree of Jesse" respectively, with any of the work of the XVth or XVIth century. The execution of the earlier examples is marvellous and the amount of toil incredible, only to be appreciated by comparison with the more careless and coarser work of the later period; the difference of half a century is clearly marked in Case B, where a cope, circa 1300, hangs by a chasuble of sixty years later. One of the most superb examples shown is that in Case I, a chasuble of red velvet, embroidered in gold thread with the three lions of England upon a ground covered with intricate foliated scrolls of gold, amongst which are figures of men and women. Case K contains one of the finest copes shown. It is of the middle of the XIVth century; it is divided into three bands of Gothic arcading, the columns formed of twisted oak stems, the branches of which canopy the figures in each arcade. The work of the XVth and XVIth centuries is at its best when free from figures; some of the velvet and silk brocade mounting the embroidery is magnificent. A chasuble of the XVth century in Case X and the Fishmongers' Pall in Case T are noticeable in this respect. The exhibition remains open during the week, and should not be missed by lovers of Gothic design and romance in art.

THE ORDINANCE SURVEY.—The International Geographical Congress recommended that a map of the world should be made to the scale of one-millionth, or about sixteen miles to 1 in. The Ordnance Survey authorities, acting, it appears, upon the suggestion, have already issued a map of the United Kingdom to that scale and printed in colours—the coast water being tinted in blue, the lakes and general outlines in black, and the hills in brown. The preparation and issue of the coloured one mile to 1 in. and four miles to 1 in. maps of the United Kingdom are making good progress under the superintendence of Colonel Johnston, R.E., director, who has just begun to publish some sheets for Scotland of the 1-in. map, and will shortly complete the 4-in. map of the United Kingdom with the issue of the sheets for the northern counties of Ireland. A former inconvenience is now removed by the folding of the maps in such a manner that one can read any part without spreading out the entire mounted sheet.

DUKE OF RICHMOND MEMORIAL, CHICHESTER CATHEDRAL.—On June 15 will be unveiled the new east window in Chichester Cathedral which will form a memorial to the late Duke of Richmond and Gordon. The window is designed by Mr. C. E. Kempe.

THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A MEETING of members of the Association of Municipal and County Engineers was held in the Council Chamber of the District Offices at Market Harborough, on Saturday, May 13. Mr. A. T. Davis, C.E., County Surveyor of Shropshire, President, occupied the chair, and among those present were Messrs. W. H. Harpur (Cardiff), J. Lobley (Hanley), A. W. Greatorex (West Bromwich), J. S. Pickering (Cheltenham), H. Richardson (Handsworth), F. C. Cook (Nuneaton), J. P. Norrington (London), G. Green (Wolverhampton), E. J. Silcox (Leeds), Norman Scorgie (Hackney), T. W. A. Hayward (Battersea), and others.

Mr. J. L. Douglass, Chairman of the District Council, welcomed the members of the Association to Market Harborough.

The President acknowledged the welcome which the Association had received, and remarked that this was the second occasion the Association had visited the town.

Cattle Market, Harborough.

Mr. G. Coates read a paper on "The New Cattle Market" at Harborough. He said that previous to the building of the new market, in 1903, the markets were held in the streets of the town from time immemorial; and, until a recent date, what was now known as "The Square" was called the "Sheep Market," because there were penned sheep, pigs, and calves. The high street was used as a pitch for cattle. The condition of Market Harborough in the past on a market-day might be imagined, and more especially on a fair day, when perhaps upwards of 2,000 beasts would be in possession. In 1900 negotiations were entered into with Lord Barnard, the present Lord of the Manor, and the market rights were purchased for 2,455*l.*, and twelve acres of grass land acquired in a central and accessible position, at the very moderate price of under 300*l.* per acre, or a total of 5,967*l.* for the market rights and the land. The six acres of land nearest the town were laid out for the market proper, the remaining six acres being used for open lairages for the stock attending the market. The work was let in five contracts and the total cost of works was 18,781*l.* 13*s.* 5*d.* The total outlay on the market, including land, purchase of rights, and works, was 25,957*l.* The market had been designed with a view to future extensions, fenced-in spaces being reserved for additional beast and sheep pens, the provision of which would not in any way disturb the existing roads or arrangements. With a view to the ultimate extinction of unsuitable private slaughter-houses in the town, the Council were building two new slaughter-houses on the market lairages, as a first instalment. The rent of each was 20*l.* per annum. It was generally considered that Market Harborough had great advantages to offer to manufacturers establishing works there. The railway accommodation was excellent; land could be had at a low price; the local rates were very small compared with other towns, and the working classes were well housed. As a residential town, or hunting centre, it could boast of an excellent water supply and drainage; a death-rate much below the average; picturesque building sites; ample facilities for sport. The Council had this year completed a quarter of a century's local self-government. The population was 8,700; the rateable value 255,929; death-rate (per 1,000) 9.41. Since the last meeting of the Association at Market Harborough, in 1897, the Urban Council had acquired the gas works (Engineer and Manager, Mr. A. T. Harris) at a cost of 49,000*l.*, including reconstruction and new offices. Also a recreation ground, comprising sixteen acres, cost 3,100*l.* The Council had taken over the care of the two cemeteries of the district. The Urban District rates were 3*s.* 6*d.* in the pound per annum.

The President said he considered the new cattle market, which he had been over, reflected great credit on Mr. Coates and the town. He thought blue bricks would have been better for the paving than random granite sets and tar paving, as they were cheaper and more easily cleaned.

Mr. T. W. A. Hayward (Battersea) congratulated Market Harborough on the admirable way in which it had dealt with the cattle market. Having previously been surveyor in a country market town, where they had no cattle market, but held the sales in the streets, he could speak of the great nuisance of such a practice to shopkeepers and residents.

Mr. A. W. Greston (West Bromwich) congratulated the District Council on the progressive policy it had pursued during the twenty-five years the town had been under its government, owning as it did the gas and waterworks and markets, and completed a successful sewerage scheme.

Mr. Smith (Kettering) approved the adoption of a separate drainage scheme for the market on other than sale days, and when the place was being cleansed, as the water for six acres of paved surface in the case of thunderstorms was a great consideration at a small sewage works.

Mr. Dickinson (Birmingham) said he was surveyor for five or six years to a market town, where cattle came and stood about the streets, and he felt that this market must be a great boon to the town.

Mr. Coates, in reply, said they did not like blue bricks, which they did not consider in unison with a rural district.

River Conservancy.

Mr. G. Coates, Assoc. M. Inst. C.E., F.S.I., read a paper on river conservancy. He said it occurred to him that the time was more than ripe for the Legislature to move in the direction of the establishment of River Boards, having control of each river from its source to its outfall, as contemplated by the abandoned Bills of a quarter of a century ago. Ought such a condition of things to be tolerated as described in a daily paper, not so long ago, of a certain town? "Over 2 ft. of water is in the lower rooms of the houses, and many families, who have not left, have taken refuge in bedrooms. Cocks and hens are seen roosting and starving in the trees, but in some cases they and the pigs share the cottages with the inmates. Punters are in use in the public streets." The Royal Commission on Sewage Disposal, appointed in 1898, had reported in favour of the setting up of River Boards, with the watershed as the administrative area, having control of the streams in respect to pollution, water-supplies, and fisheries. If, therefore, Parliament would pass a Bill based on the conclusion arrived at, after hearing expert evidence by its Select Committee and its Royal Commissioners, the country would greatly benefit. If the whole condition of the watercourses of England was looked at broadly it was difficult to believe how people had tolerated their neglect so long. We had not so treated the question in Egypt. No doubt, if there occurred several consecutive years of excessive rainfall, or, on the other hand, of drought, the question would be forced into practical politics again; but the law of averages worked in favour of letting things alone. There were two reasons why authorities had not hitherto been established for the management and control of our rivers and streams: (1) The unwillingness of legislators to interfere with private property, vested interests, or prescriptive rights. (2) The difficulty of propounding an equitable rating scheme to provide the necessary funds for the administration by the River Authority. With regard to the first objection, the riparian owners having failed to remedy the existing evils with their present powers, and a case having been made out for action, Parliament should intervene in the interests of the community at large.

Respecting the second objection, it should not be beyond the wisdom of Parliament to devise an equitable rating basis for one more body, having regard to the number of administrative bodies already established. The average rainfall for the forty-five years ending in 1902 (as given in "British Rainfall") was approximately 25 in., whereas the exceptional floods of 1903 were caused by a rainfall of 36 in. One of the duties of a River Board would be to gather reliable data as to the rainfall in the watershed under control, together with the known flood-heights, the strata of the districts, etc., upon which the remedial works could be based. Observation and records of various important matters would, in the course of a very few years, lead to a thorough knowledge of the eccentricities of the streams. It should not be impossible in most districts to know at different degrees of saturation of the subsoil just how much rain, falling in a given time under present conditions, would cause a flood, how long the flood would be in rising, and its duration. If one could take a certain river and measure the distance, as the crow flies, from its source to the sea, and divide by the total fall, they would not get its true hydraulic gradient, as its meandering and twisting and doubling

would make the real distance much greater. The sharper the gradient the less sectional area of waterway was required to pass off a given amount of water; it was evident, therefore, that the straighter the channel, the sectional area being the same, the quicker would the water get to the sea. The channels should therefore, where practicable, be straightened, and the loops cut through, as this might save widening. Where the channels could not be straightened or widened they might be embanked or deepened. There were bridges which would be sufficient for passing on flood-water were the side arches kept clear of sediment and obstruction; but, on the other hand, there were other bridges which are great obstructions themselves, with insufficient waterway either in width or head-room, or both. It was to be hoped, however, that no picturesque old bridges would be pulled down unless absolutely necessary, as it would be possible in many cases to relieve the pressure by means of additional flood arches and wallows without perpetrating acts of vandalism. The occurrence of calamitous floods must never make them forget that there were such evils as droughts, when vegetation was burnt up for lack of moisture, and farmers and graziers would give almost anything for water. Here, then, was scope for the attention and foresight of a River Board. To the extent to which it was possible, means should be devised for holding up the level of the available water in the rivers and tributaries for the irrigation of land lying below that level. This could be accomplished by the installation of movable gates, placed either in the main stream or in a sufficient tributary stream, and the water conveyed from the upper side of the weir, by a side channel or a system of pipes, to the land below. In some localities it would be quite feasible to impound flood-waters in storage reservoirs at sufficient elevation to command certain midlands and lowlands. It was generally conceded that the storage of flood-water had an infinitesimal effect in the mitigation of floods, the quantity of water which it was possible to hold up being so very small in comparison with the water rolling down the stream. But whilst this fact was true, it was most desirable to store water for purposes of water supply, municipal purposes, and irrigation. In many districts the acquisition of land for the construction of impounding reservoirs would not be a very serious affair, with the low prices of land obtaining to-day. There seemed no reason why each River Board should not allot sources of water supply for every town and village within their watershed. This would prevent the large towns, with the longest purses, inequally securing what ought really to be the supply of some smaller place. On the other hand, it would lead to the economising of the available supplies by preventing districts from monopolising far more gathering ground than was reasonable for future use. In England it must always be remembered that the watersheds were constant, whilst the population was increasing; so that the conservation of water was really a question of national importance. The Board of Agriculture had recently recommended to water authorities the afforestation of catchment areas. This would tend to keep the water supply purer, and increase infiltration by arresting evaporation. Whilst the owners of existing water-mills would, of course, be privileged to retain their water rights—always provided those rights were not detrimental to the public weal, in which case their suppression would be subject to compensation—the River Board would in certain cases be able to lease water power to landowners and others where the levels and conditions were possible. A survey and consideration of the whole watershed would reveal, in many localities, possibilities for the utilisation of water power at present overlooked, or impossible to utilise under the present limited jurisdiction. The control of the watershed by a River Board would lead to the employment of a considerable amount of labour in the country. Not that labour would be employed for the sole purpose of giving relief to the unemployed, for that might be unremunerative, whereas the object of the Board would be to execute work calculated to benefit property, and the comfort, health, and prosperity of the community.

The President remarked that until we had River Boards he was afraid our rivers, instead of being brought back to their original state of clear and pellucid streams, would continue to be polluted. A general adoption of the

policy pursued by the Yorkshire Rivers Board would be for the good of the country.

Mr. E. J. Silcock (Leeds) said that coming from the West Riding of Yorkshire, where the Rivers Board was somewhat active, he could tell them that they had done a considerable amount of good in keeping pollution out of the rivers in the West Riding. But they had not sufficient powers, and were in the unfortunate position of not being able to get further powers. They proposed to go to Parliament this session, and an action was commenced against them by one of the contributory bodies to prevent them applying their funds for the purpose of obtaining powers. They were thus in the position that they had funds to spend but could not spend them in getting further powers. That crippled them to some extent. There would have to be legislation introduced to invest them with considerably more powers than they had at present.

Mr. J. S. Pickering (Cheltenham) said one great hardship in approaching Parliament was the enormous expense involved in getting Bills through. Although practically unopposed, the Nuncaton Bill cost 1,200. This money had not gone into the pockets of the engineer who had done the bulk of the work, but had been taken by the lawyers. He spoke strongly upon this, because he thought it was a scandalous thing that any town should be put to such enormous expense in carrying out a necessary public work.

Mr. Smith (Kettering) considered that with schemes of public water supply the local authority ought not to have to give back one-third of the water as compensation. Something smaller than one-third should be the quantity given to a river or stream, and if the riparian owners wanted more they should pay for that from which they benefited so much.

Mr. Cook (Nuncaton) considered that the cost of obtaining powers for the improvement of rivers prevented a good deal of necessary work being carried out by the smaller towns all over the country.

The President suggested that with the formation of River Boards the boundaries should coincide with the boundaries of the watershed area.

The members then visited the markets, after which Mr. Coates entertained them in the luncheon in the Settling-room of the Market buildings. In the afternoon the members visited the source of the water supply at Kilworth.

THE ROYAL SANITARY INSTITUTE.

The annual dinner of the Royal Sanitary Institute was held on Friday last week in the Prince's Restaurant, Piccadilly. His Grace the Duke of Northumberland, K.G., President of the Institute, presided, and there were present the Right Hon. Earl Egerton of Tatton, Dr. Percival, Bishop of Hereford, Colonel J. Lane Nutter, R.A.M.C. (Chairman of the Council of the Institute), Sir R. Douglas Powell, Bart. (President of the Royal College of Physicians), Sir Francis Sharp Powell, Bart., Sir Aston Webb, R.A., Sir Alexander Binnie, Sir Arthur W. Rücker, LL.D., Sir W. J. Collins, D.L., Sir Henry C. Burdett, K.C.B., Sir G. R. Phillips, LL.D., Sir Shirley F. Murphy, Despatch General H. Mackay-Ellis, Professor H. R. Clark, son, Messrs. T. W. Aldwinckle, Andrew Clark, D.Sc., H. P. Adams, T. W. Cutler, H. R. Collins, A. J. Davis, E. T. Hall, A. H. Reid, E. D. Searle, Wood, J. Slater, J. Osborne Smith, J. C. Scovell, J.P., J. F. J. Sykes, A. Saxon Smith, J. J. White, E. White Wallis, Secretary, and others.

The loyal toasts having been proposed by the Chairman (who remarked on the honour the King had conferred on the Institute in allowing them to assume the title of "Royal Sanitary Institute"), Sir Alexander Binnie (Sanitary matters), Sir Alexander Binnie (Sanitary matters), "The Navy, Army, and Reserve Forces," which was acknowledged by Director-General H. Mackay-Ellis, of the Royal Navy Medical Department.

Sir William J. Collins then proposed "The Houses of Parliament," coupled with the names of Dr. Percival, Bishop of Hereford, and Sir of Dr. Percival, Bishop of Hereford, and Sir Francis Sharp Powell, Bart. Dr. Percival expressed his gratitude to the Institute for the work it was doing. In regard to the housing question, the great landowners had set the best possible example—and one which was followed in the glad to see more generally followed—for matter of the provision of cottage homes for the working people. But wherever he went in the villages of his diocese he found that the

greatest needs was for more healthy cottage homes. Many of our country children suffered from health, physique, and morals from the defects of their homes, and he was glad to know that the Institute was doing a great deal to cure the evil.

He asked one of his city clergy recently how he would describe an unfit for the parish which he had in his charge, bringing up of Christian children, and he replied that he had at least 120 such homes in his parish of 4,000. There were scores of such parishes stretched up and down our country, and he thought that we should take care that the occupants should grow up under better conditions.

Sir F. Sharp Powell, Bart., said he thought that a great part of the duty of Parliament in regard to sanitary legislation had been done for the time, and it was now rested with the local authorities throughout the country to exercise their powers with discretion and firmness and with wisdom. There were some cases which he was aware of where these powers had been exercised in a vexatious way as to have thrown back on the rate-payers; he hoped that with gentleness, discretion, and knowledge that these powers might be put into operation in such a manner as to prevent a reaction an evil which he feared—and that there would be a continual progress and advance towards that more perfect condition to which he hoped we would all arrive. Many sanitary reforms would have to be made, and he would like to see placed on the statute book the consolidation of our sanitary laws; they were far too antiquated and complicated. It would be a great benefit to this country when public opinion became so active as to force Parliament to take up this question. The present Legislature were not insensible to duty in this matter, and was a want of opportunity which prevented Bill being introduced to consolidate the public health law of the country.

The President, in proposing the toast of "The Royal Sanitary Institute," said that the Institute had been in active operation about thirty years, and they had done their best to meet the requirements of the age and to perform the work they were originally formed to do. The Institute consisted of over 3,200 members, and it had an income of something like £8,000 a year. In the course of the last year 466 meetings of various kinds in connexion with the Institute had been held, and they had been attended by over 37,000 people. From that it would be seen that the Institute was doing good work and that they must be making an impression on the country; but one result of their success was that they required better accommodation. The Institute had a valuable museum and library, they did much in the way of lecturing and training in sanitary science and in examining those who would submit themselves to examination, and the time had come when it was necessary to have more room. As the scheme had been prepared, and it was proposed to secure an excellent site in an important part of London where it would be possible to erect a building which would meet with the needs of the Institute. They had about 10,000 towards this object, but 15,000 more was required before they could realise their hopes, and, though that was a large amount to raise, he could not help thinking that if each one of them did their best to meet the demands, and if they appealed to those throughout the country who appreciated the work the Institute was doing, it would not be impossible to reach that sum and so put the Institute in a position which would be commensurate with its great aims and its great achievements. He presumed that the duty they set before themselves by the various agencies which they put in force was to maintain a high standard of sanitary science throughout the country, both in theory and in practice. He hoped they would always keep the object of the best before them and yet look at matters from a practical point of view and secure for the people the sanitary conditions which were reachable rather than by aiming too high to delay improvement which could otherwise be achieved. No one who knew anything about the subject could fail to agree with what the Bishop of Hereford said as to unfit dwellings. The one great difficulty in the way of improvement was the expense which building under many by-laws necessarily entails. These by-laws might be theoretically right, but practically it was almost impossible to carry them out with any due regard to business principles which more or less affected everyone—i.e., that they must get a fair interest on outlay. No one could do a more benevolent act to the people

of the country than to devise means by which cheap sanitary dwellings might be erected, and he hailed with great pleasure the prospect of the forthcoming exhibition of cheap houses. There were many who could by their criticism and advice in the matter do much good, valuable work which would be of lasting benefit to the nation.

Colonel J. Lane Nofter, the Chairman of Council, in reply, said that the aim of the Institute had been to carry out that great duty which devolved on them as members of the State to render, in the words of a great master of hygiene, growth more perfect, decay less rapid, life more vigorous, and death more remote. This entailed great labour and time, which was given ungrudgingly by members of the Council, all of whom were men busily engaged in their various professions. The Institute had contributed largely to the education of inspectors of sanitary work and had laid the foundation of their knowledge by the method of teaching and by the examinations. The work of the Institute was not confined to the United Kingdom; it embraced British dominions beyond the sea. It was not proposed to adopt the new premises scheme outlined by the President, or any other scheme, without taking the members into the confidence of the Council, and as soon as possible a meeting would be called for the purpose of considering the matter. Much would depend on the present appeal for funds and how far they would be justified in adopting the scheme or any other. The scheme had so far appealed to all classes of members and a large number of subscriptions had been received.

Sir Aston Webb then proposed the toast of "Our Guests." It had been said that, though we live longer, we do not live stronger, and we do not live better. It was by means of the work of some of their guests that night that they hoped to find out the means by which they may live longer, stronger, and better.

Sir R. Douglas Powell, Bart., replied, and the proceedings terminated.

THE ARCHITECTURAL ASSOCIATION SUMMER VISITS:

I.—CONSUMPTION HOSPITAL, NORTHWOOD.

The summer visits of the Architectural Association began on Saturday, May 13, when a large number of members assembled at Northwood, Middlesex, to inspect a new hospital for consumptives, and the success of a very interesting visit was enhanced by the presence of the architect, whose information was much valued.

This institution forms the country branch of the Mount Vernon Hospital, Hampstead, for diseases of the chest, and provides beds for fifty men and fifty women, accommodation for an administrative and quarters for a proportionate medical, nursing, and domestic staff. The remaining departments comprise a large dining-room for patients, kitchen and offices, stables, laundry, electric lighting plant, water softening and pumping station. The various parts are disposed in eight separate buildings, some of which are made intercommunicative by means of closed corridors.

From a limited competition for designs the plans of Mr. Frederick Wheeler were selected, and the complete work has been carried out under his supervision by Messrs. Holland & Hannen.

The whole of the expense is borne by an anonymous donor, whose liberality is evident in the lavish and generous nature of the scheme.

The 100 patients are housed in wards arranged in two wings set obliquely with the main building. Here also is a central block containing medical officer, matron, consulting-room, servants' dormitories, and water tower, while each of the wings terminates in a very large winter garden. A wide terrace runs throughout the entire length of the main front and a balcony of similar length is built for use on the upper floor.

The general principle of the institution is that of a hospital rather than a sanatorium. Some of the beds in the wards are set in distant corners and most of them are placed away from the windows, a proceeding which is at variance with current experience in this subtle treatment. A cubic space of 1,400 ft. has been secured to each patient, but such a provision appears to be unnecessary where everything should be open and free to the fine air which this charming locality possesses. The same wasteful accommodation is found in the dining-hall, kitchen and offices, laundry, and electric light plant, etc., where provision is made for a light plant, etc., where provision is made for a place very much larger than that under notice.

The buildings are very satisfactorily designed with an XVIIIth century treatment, and an excellent colour combination of materials is seen in the fronts. Grey Luton bricks, relieved by a judicious mixture of reds, constitutes the general walling, which is finished at the eaves level with a painted deal cornice. Long, simple roofs of dull Broseley tiles in pleasing colour impart dignity to the design, whereas the central tower and entrance receive importance by the introduction of Douling stone.

The interior is very much in character with what is usually found in hospitals, but some interesting departures are made in grates and central warming stoves.

In marked contrast with the restraint seen in the architecture of the hospital, a chapel seating 200 people has been designed in a somewhat crude manner and placed near the eastern extremity of the main building. Apart from the long, sloping stone buttresses and large unbroken masses of flint facing, the arrangement is suited to ordinary demands and is quite unfit, in our opinion, for the use of consumptive patients. There is ample room for religious services for the patients of various denominations in the large dining hall where the wall surfaces and the ventilation are more in the nature of what is required for consumptives. The prominence of this chapel is certainly not a cheering element in the beautiful surroundings of the site and the 10,000l. thus expended would have been more wisely used if applied to the direct purpose of the institution—the saving of life.

THE LONDON COUNTY COUNCIL.

THE first meeting of the London County Council after the Easter recess was held on Tuesday in the County Hall, Spring-gardens, Mr. E. A. Cornwall, Chairman, presiding.

Leases.—On the recommendation of the Finance Committee, it was agreed to lend Camberwell Borough Council 5,000l. for erecting working-class dwellings, 11,350l. for site and erection of baths, and 5,800l. for a footbridge; Finsbury Borough Council 2,324l. for street improvements and paving works; Hammer-smith Borough Council 1,800l. for construction of underground conveniences and 15,590l. for poor-law purposes; Lambeth Guardians 4,800l. for poor-law purposes; Lewisham Borough Council 1,248l. for street improvements; Poplar Borough Council 30,013l. for paving works and 1,350l. for additional exit at Bow Baths; and Woolwich Borough Council 6,500l. for electric lighting purposes. Sanction was also given to Chelsea Borough Council to borrow of 16,500l. for street improvement.

Schools.—On the recommendation of the Education Committee, it was agreed to spend 3,447l. on the erection of a school for mentally defective boys at Beaufort House, Fulham, and to entrust the work to Messrs. Stimpson & Co.

Tramways.—The Highways Committee submitted their report recommending that the Council should purchase for 121,000l. the remaining interests of the North Metropolitan Tramways Company in the Council's (Northern) Tramways. It is desired to determine the lease at the earliest possible time, in order to expedite the electrification of the lines. The committee also recommended that the rolling stock, horses, plant, and machinery should be purchased for 315,000l.

Mr. Allen Baker (chairman of the committee), in moving the adoption of the recommendations, claimed that the financial success of the electrified lines in South London fully justified the Council in their proposal to determine by agreement the lease with the North Metropolitan Company, so that the people of North London might have the benefit of electric tramways four years earlier than would otherwise be the case. The electric tramways in South London had been an immense boon to the people. They were becoming increasingly popular, and were doing much to solve the housing question in the south. They had every reason to believe that similar results would follow the electrification of the northern lines.

Mr. Harris moved as an amendment that it was inexpedient to enter into the scheme, involving an expenditure of 6,000,000l. on the electrification of the northern lines on the conduit system, until the Royal Commission had reported, when it was expected that the needs of London and the precise means by which they could most conveniently and economically be met were likely to be ascertained.

Sir Melville Beachcroft formally seconded the amendment.

After considerable further discussion the amendment was, upon a division, rejected by seventy-four votes to twenty-one.

The recommendations of the committee were then adopted by a large majority.

Unopposed business was transacted and the Council adjourned at 8.30 p.m.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Kensington, South.—Projecting bay-windows and a projecting hood in front of a block of buildings on the site of Nos. 2 and 4, Charles-street, Kensington (Mr. A. B. Rumball).—Consent.

Hamstead.—Six buildings upon a site abutting upon the south-western side of Finchley-road and northern side of Lymington-road, Hamstead (Mr. W. A. Rabson for Mr. W. F. Cave).—Consent.

Battersea.—An addition to the Gonville and Caius College Mission buildings on the north-western side of Harroway-road, Battersea (Messrs. W. & C. A. Bassett-Smith for Rev. A. Shillito).—Consent.

Clapham.—Iron and glass porches to flats on the west side of Bedford-road, Clapham, between Aristotle-road and Kendosa-road (Messrs. Ayre & Kingcome).—Consent.

Hammersmith.—The retention of open-letter signs at No. 131, King-street and No. 130, Goldhawk-road, Hammersmith (Mr. W. H. Duffield for Mr. D. Greig).—Consent.

Islington, North.—The retention of a wooden porch at No. 82, Archway-road, Highgate (Mr. A. Goodchild for Mr. J. B. Evans).—Consent.

Kensington, South.—One-story shops at Nos. 164 to 172 (even numbers only) inclusive, Earls Court-road, Kensington, to abut also upon Pennywern-road (Mr. W. G. Hunt for Messrs. Jones Brothers).—Consent.

Lewisham.—Iron and glass porches in front of fourteen houses on the south-west side of Chudleigh-road, Brockley (Messrs. J. W. Heath & Sons).—Consent.

Lewisham.—Houses with bay-windows on a site on the north side of Belmont-hill, Lee between "Moray House" and Belmont-road (Mr. W. P. Neal for Messrs. H. & G. Taylor).—Consent.

St. George, Hanover-square.—Fixing of two arc lamps under the iron and glass shelter at Hatchett's Restaurant, Piccadilly (Messrs. Marples, Leach & Co.).—Consent.

St. George, Hanover-square.—Enclosures to the sides of a porch at No. 18, Grosvenor-street, St. George, Hanover-square (Messrs. G. Trolope & Sons and Colls & Sons, Ltd., for Mrs. McCalmont).—Consent.

St. George, Hanover-square.—A projecting sign at No. 157A, New Bond-street, St. George, Hanover-square (Mr. I. C. Goodison for Messrs. I. & P. Mendoza).—Consent.

Wandsworth.—A building on a site abutting upon the western side of Putney-hill, and southern side of Upper Richmond-road, Wandsworth (The Metropolitan Borough of Wandsworth).—Consent.

Waltham.—A building on the site of No. 43, 45, and 47, Villa-street, Waltham (Messrs. E. Runtz & Ford for the Hon. Maude Stanley).—Consent.

Strand.—A projecting sign at No. 11, Wardour-street, St. James', Westminster (Mr. J. Richardson for Messrs. Sam Isaacs & Co., Ltd.).—Refused.

Wandsworth.—A one-story addition adjoining No. 54, High-street, Tooting (Mr. S. S. Dottridge for Mr. E. Dottridge).—Refused.

Width of Way.

Woolwich.—Four cottages on the west side of Red Lion-lane, Woolwich, northward of No. 1 (Mr. J. Rowland for Mr. W. Heffer).—Consent.

Rotherhithe.—That the application of Messrs. Barlow, Roberts, & Thompson for an extension of the periode within which the erection of five warehouses upon a site abutting on the southern approach to the Tower-bridge, northern side of Queen Elizabeth-street and western side of Horslydown-lane, Rotherhithe, was required to be commenced and completed, be granted.—Consent.

Width of Way and Lines of Frontage.

Marylebone, East.—The retention of an iron and glass covered way in front of No. 1, Titchfield-road, Regent's-park (Mrs. L. Charles).—Consent.

Space at Rear.

Battersea.—A modification of the provisions of section 41 with regard to open spaces about

buildings, so far as relates to the proposed erection of an addition to the Gonville and Caius College Mission buildings on the north-western side of Harroway-road, Battersea, with an irregular open space at the rear (Messrs. W. & C. A. Bassett-Smith for Rev. A. Shillito).—Consent.

Whitechapel.—A modification of the provisions of section 41 of the Act with regard to open spaces about buildings, so far as relates to the proposed erection of an addition at the rear of No. 108, Commercial-street, Spital-fields (Messrs. Hovenden & Barber for Mr. E. Wakefield).—Consent.

Battersea.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of buildings on a site abutting upon the north side of York-road and east side of Lombard-road, Battersea (Mr. E. Cannell for Mr. F. Priddie).—Refused.

Formation of Streets.

Lewisham.—That an order be issued to Mr. H. Winstanley refusing to sanction the formation or laying out of new streets for carriage traffic upon the Ravensbourne Park estate, Catford, to lead out of the west side of Ravensbourne Park-road (the Governors of Sir John Cass's Foundation).—Refused.

Formation of Streets and Erection of Buildings.

Zachary, Central.—That an order be issued to Messrs. Staines, Morris, & Stone sanctioning the erection of buildings on sites abutting upon the east and west sides of Priory-place, Well-street, Hackney, and the widening of a portion of Priory-place (Mr. C. Winkley).—Agreed.

Chelsea.—That an order be issued to Messrs. Bourchier, Burnmaster, & Galeworthy, sanctioning the formation of a new street, the widening of existing streets, and in connexion therewith the erection of buildings upon the estate of the Cadogan and Hans-place Estate (No. 3), Ltd., on the south-eastern side of Fulham-road, and the south-eastern and north-western sides of Cadogan-street, Chelsea (the Cadogan and Hans-place Estate (No. 3), Ltd.).—Consent.

Lines of Frontage and Working-class Dwellings.

Norwood.—A block of working-class dwellings on a site on the western side of Drixton-hill, Norwood, northward of No. 115, Mr. R. Robertson for the Housing of the Working Classes Committee of the Council).—Consent.

Means of Escape from Top of High Buildings.

Strand.—Means of escape in case of fire, proposed to be provided in pursuance of section 53 of the Act, on the sixth (top) stories of Nos. 169 to 173, Piccadilly (Mr. W. Woodward for Messrs. Jackson and Messrs. Peat).—Consent.

Strand.—Certain deviations from the drawings approved in respect of the means of escape in case of fire on the fifth and sixth stories of the staircase block and the fourth story, and galleries over, of the surgical ward block, Charing Cross Hospital (Mr. A. Saxon Snell).—Consent.

ARCHITECTURAL SOCIETIES.

MANCHESTER SOCIETY OF ARCHITECTS.—On May 2 this Society began its summer programme of visits, about thirty members going to the Church of the Christian Scientists, Victoria Park; Mr. Edgar Wood, architect. The entrance forecourt shows picturesque grouping of simple and unusual character, and the interior, when completed to double its present length, will be very satisfactory, the whole design showing considerable individuality and suitability to its purpose. Afterwards the members visited St. Chrysostom's Church to study the effects of the recent fire, finding very complete proofs of the unreliability of stone when exposed to heat and water. On Saturday, May 6, a visit was made to Leeds to see the new Roman Catholic Cathedral; Mr. J. H. Eastwood, architect. A considerable time was spent, under the guidance of the clerk of works, in thoroughly examining the building, and much of interest was found, both in detail and in general design. The party then divided, and utilised the little remaining time in making flying visits to Kirkstall Abbey, or to Mr. Bodley's fine church at Allerton.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—At the annual general meeting of the Birmingham Architectural Association, held at the Midland Hotel, the President in the chair, the result of the ballot for the election of officers was declared as follows:—President, Mr. Thomas Cooper; Vice-President, Mr. J. L. Ball; Members of Council, Messrs. H. T. Buckland, Arthur Harrison, William Honman, Alfred

Hale, A. E. M. Kewan, E. L. Parnall, and E. F. Reynolds; Hon. Treasurer, Mr. Edward Hale; Hon. Librarians, Messrs. J. A. Swan and E. H. Worsley; Hon. Secs., Messrs. Gerald McMichael and A. Dennis Thacker. The question of the annual excursion was discussed and it was decided to go to Mont St. Michel and Whitsuntide.

Books.

Steam Pipes: Their Design and Construction. A Treatise on the Principles of Steam Conveyance and Means and Materials Employed in Practice, to secure Economy, Efficiency, and Safety. By Wm. H. Booth, M.A., Soc. C.E., late of the Manchester Steam Users' Association, the New South Wales Government Railway Department, etc. London: Archibald Constable & Co., Ltd. 1905.

It is announced in the Preface that the intention of this treatise is to bring together such information with regard to steam pipes as will be of assistance to the engineer who has to face problems arising out of the conveyance of steam from point to point. Although the author has evidently set before him as a primary consideration the needs of those employing pipes for the supply of steam engines, his book may prove to be of service as a guide to the design of distribution systems for other purposes. After a few introductory remarks, "The Flow of Steam" is discussed in Chapter II, wherein Mr. Booth gives a short series of tables with explanatory directions for the ready selection of pipes suitable for the delivery of any desired weight of steam per minute, or hour. A pipe equalisation table is contained in the same chapter, but its value is somewhat impaired by the fact that it has been reproduced from an American source, and consequently does not apply with accuracy to British standards. It certainly is a pity that the author did not take the trouble to prepare a table suited to the exact requirements of his readers.

Chapter III is devoted to "Materials," the most commendable thing about it being the collection of notes as to the relative merits of cast-iron, wrought-iron, steel, and copper pipes. We fully agree with the recommendation that cast-iron should not be used to pressures of more than 100 lb. per sq. in. Lap-welded, solid drawn, and riveted steel pipes can now be obtained so readily and at such reasonable prices that there is really no excuse for continuing to employ cast-iron pipes in fittings except for low pressures. The author gives a further note of warning when referring to copper. Pipes of this material are flexible because they are weak; when solid drawn they are liable to longitudinal splits, and when brazed the metal may be rendered brittle if the air supply to the brazing hearth has been insufficient. Moreover, brazing becomes rotten if the pipes are used for the conveyance of superheated steam. After pointing out that in Admiralty practice copper pipes are now round with steel wire as a precaution against ripping, the author advises engineers to use copper pipes for steam, and very properly characterises the steel pipe as the most important in every way for high pressure and some explanation. Three or four tables and some explanatory matter in this chapter are of report of the useless by the publication of the report of the Engineering Standards Committee on "British Standard Pipe Flanges," which appeared just as the present work was going to press. Knowing this report to be due, the author would have done well to omit the matter altogether, and he certainly need not have given an abridged list of American wrought-iron pipes, to the exclusion of British dimensions. A paragraph entitled "Flexible Metallic Pipes" serves a useful purpose by directing the attention of readers to this very convenient form of conduit.

By some oversight, however, a second reference to flexible metallic tubing has been printed in the middle of a paragraph dealing with wrought-iron tubing. This is not the only slip in Chapter III, which is very carefully put together, and requires re-arrangement throughout. Some useful forms of expansion bends, joints, and couplings are illustrated in the succeeding chapter, and after this come particular relative to the "Strength of Pipes," "Anti-Riveting Pipes and Pipe Supports," "Pipe Joints," and "Pipe Supports." Chapters IX and X have attractive titles, but both of them are too short. The former

with the "Erection of Pipes," and from one or two serviceable hints may be gathered as to the setting out of pipes in a power-house, addition of branch lines with a minimum amount of stoppage, and the bending of iron, steel, and copper pipes. The latter is devoted principally to the arrangement of pipes in modern power-stations, and although written in very general terms may prove suggestive to those who may be called upon to lay down steam plants comprising a range of several boilers and engines.

Chapter XI, on "Valves," is largely occupied by minute particulars of the valves made by one firm whose name we do not choose to mention, and if we did it would probably not be recognised by the bulk of our readers. The details given are of little use except by way of advertisement, as they are not generally applicable, and, moreover, some of them are now superseded by the recently published dimensions of British standard flanges. The latter criticism applies to the chapter on "Junction Pieces and Flanges," in which the author gives various flange dimensions, and also drags in tables of American origin. A few particulars of generators, exhaust heads, and atmospheric valves will be found a little later, but the reader could learn far more as to these from one or two good trade catalogues. For some incomprehensible reason the author has considered "Pipe Coverings" under the inappropriate heading of "Superheated Steam." The chapter with the last-mentioned title only contains thirty-five lines on the subject which it professes to discuss, the remaining twenty pages being devoted entirely to pipe coverings. This gives more evidence of the overfulness on the part of a writer, one of whose objects in the present treatise is to inculcate precision and careful attention to points of detail. We have no fault to find with the discussion of pipe coverings, except that the author seems to know nothing of British practice, and has drawn all his facts from American sources. Chapter XVI, entitled "Weights of Pipe," does not contain much more than a series of tables giving the dimensions of pipe bends and flanges, some copied from the list of a specified maker, and others from an undefined source. Two pages at the commencement on the weights of pipe give a little justification for the title selected. The work concludes with a short mention of "The Elastic Theory of Gases." We are told that "the theory is certainly an aid in the comprehension of the behaviour of flowing steam." This being so, we wonder why the author has not thought it worth while to explain to his readers how the theory is to be applied. This concluding chapter seems to have been entirely an afterthought, for the subject-matter properly belongs to Chapter II, which, as before mentioned, deals with "The Flow of Steam."

While not deficient in good points, this book is distinctly disappointing, and cannot be recommended as one adequately, or even reasonably, fulfilling the object announced in the Preface. We do not doubt the capacity of the author to write a really valuable treatise on the subject chosen, and regret that he has not taken the trouble to do so.

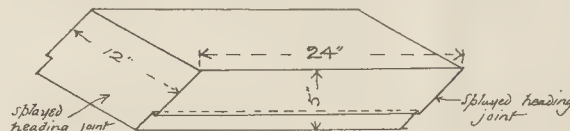
An Epitome of the Law Relating to Easements.
By T. T. BLYTH, Barrister at Law. London: Sweet & Maxwell, 1905.

This little volume, which forms one of the "Students' series," is stated in the preface to have been written with the object of enabling students to attain an elementary knowledge of the law relating to easements, and appears to have been well conceived to attain this end. The legal propositions are set out in large type at the head of short paragraphs, and are well supported by a reference to the decided cases upon which they are founded, and the index seems more copious than that supplied with some books for students. The abbreviation of the official references to some of the reports in the Law Reports is, however, perhaps to be regretted, since an accurate knowledge of such references forms part of the education of the student, and even a small deviation is to be deprecated. The cases seem to be well brought up to date, as we find the latest case on the law of light, *Mellor v. Gordon*, decided on January 20 of this year, recorded. Dealing with the remedies for interference with easements, the author raises the question whether the rights expressed by the House of Lords in the case of *Colls v. Home and Colonial Stores*—the preference to be given to damages—place of injunctions in cases of obstruction

to light may affect the practice in relation to other easements, but such a doubt appears to be unnecessary, since in the case of most easements, such, for instance, as rights of way, an injunction remains the only effective remedy to protect the right. This criticism is, however, rather academic, since this subject is only dealt with very shortly in these pages, which, in a very readable form, appear to supply the student with a useful knowledge of the law of easements.

The Sewage Problem: A Review of the Evidence Collected by the Royal Commission on Sewage Disposal. By ARTHUR J. MARTIN, A.M.Inst.C.E., M.R.San.I. London: The Sanitary Publishing Co. 1905.

ALL who have had occasion to study the evidence collected by an important Royal Commission know the trouble involved in tracing the evidence of the various witnesses on any particular part of the subject, and all persons interested in the problem of sewage disposal will be grateful to Mr. Martin for the useful digest of the large mass of evidence which has been collected by the Royal Commission, whose labours are now nearly at an end. The book is divided into nineteen chapters, of which the first is "Introductory"; two chapters deal with purification on land, another with chemical precipitation, eleven with bacterial processes and methods, and the last four chapters with "Filters versus Land." "Other Aspects of the Problem" (including standards of purity, sewage effluents in relation to disease, trade effluents, etc.), "Supplementary Reports on Land Treatment, etc.," and "The Outlook." The author has collected some of the most important evidence given by witnesses on each part of the subject, and has connected it by a running commentary and supplemented it in parts by information obtained from other sources. The book, which runs to 363 pages and contains an excellent index, can be heartily



recommended to all who wish to obtain a concise and connected account of modern expert knowledge on all the most important aspects of the sewage problem.

Simple Methods of Testing Sewage Effluents.
By GEORGE THUDICHUM, F.I.C. London: The Sanitary Publishing Co. 1904.

THIS little book of sixty pages has been written to aid borough engineers, surveyors, and managers of sewage works who have not received a chemical training, in making a number of physical and chemical tests which will enable them to ascertain in a general but sufficiently accurate way the condition of the effluents from sewage-works under their control. Nearly all the tests are of a simple character, and the book will be heartily welcomed by those for whom it has been written. The author writes clearly and as non-technically as the subject will permit. The chapter on "Standards" is particularly interesting; Mr. Thudichum objects to many of the standards which have been proposed, on the ground that they involve too much labour and expert chemical knowledge, and suggests a standard which should have for its main point the ratio between the oxidised nitrogen in the effluent and the albuminoid nitrogen in the original sewage. He does not fix this ratio in definite terms, but maintains that the albuminoid nitrogen in the original sewage will be less "by a considerable amount" than the oxidised nitrogen in any really satisfactory effluent from that sewage.

PRIMITIVE METHODIST MANSE, FERRYHILL.—A new Primitive Methodist manse has recently been opened at Ferryhill. The building was designed by Mr. Wilford Phillipson, of Spenny-moor, of the firm of Messrs. Davidson & Phillipson, of Newcastle, and has been erected at a cost of 750l.

Correspondence.

"URGENT"—re R.I.B.A. ELECTIONS.

SIR,—I have read with much interest the article and correspondence in *The Builder* on the subject of R.I.B.A. elections.

No doubt "Statutory Qualification," "Registration," "Anti-Registration," "The Institute," and "The Profession," are all delightful subjects for discussion, but after all, to an architect, *Architecture* is of infinitely more importance.

CYRIL YOUNG.

* * We cordially agree with Mr. Young.—Ed.

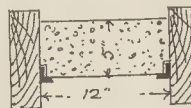
CONCRETE PUGGING FOR FLOORS.

SIR,—We venture to draw the attention of architects and all connected with building operations to an item in the proposed Building Act Amendment Act that the London County Council are putting forward, and which we believe they hope to get passed during the present session of Parliament. As you are aware, the Amendment Act, as a whole, has been dropped, but part 6, which deals with further means of fire prevention, is still intended to be carried through.

The matter we wish to draw attention to is that of the pugging to form what is described as a fire-resisting floor. The draft enactment is that 5 in. of coke breeze concrete should be placed between joists, supported on a fillet 1 in. square, which fillet shall be placed in the centre of the depth of concrete, and so that which is, to our minds, the dangerous employment of wet concrete, is to be perpetuated; as far as we can learn, no alternative system is to be allowed, and there is no appeal from this under any circumstances, and so this system is to be looked upon as the last word of the teaching of present scientific knowledge. It is common knowledge that the placing of wet concrete pugging between joists is a dangerous practice, and has, in too many cases, led to the total destruction of a floor by "dry rot."

Surely there should be some alternative method that architects should be enabled to use? We have several substances in our mind, and methods of application, but hesitate to mention them lest it should be thought we are interested in some special method or material.

If concrete is to be employed, why not allow it to be used in cast slabs, which would be perfectly dry before being placed in situ? May we describe floors which we are at present constructing at a block of buildings erected at the corner of Darnley-road, Mare-street, Hackney, N.E.? In this case, we have



used 1-in. angle-irons, spiked to the side of joists with galvanised clout nails; the blocks are cast 2 ft. long, 5 in. thick, with splayed heading joints, and allowed to thoroughly dry before use; they are bedded in position, grouted in, flushed up, and pointed top and bottom (see diagram).

It is to be noted that the clout nails are secured from the action of fire by the sides of the blocks, and that they cannot come out and allow the angle-iron to drop. We would venture to ask why any architect should be precluded from employing such a system as this. From tests made, it is as smokeproof and fireproof as concrete filling placed in wet, it is a more secure and substantial mode of construction than the deal fillet would afford, is of very little greater cost, and there is the minimum danger of "dry rot." Should any gentleman feel interested in the question, if he will call at the building named and give his card to the general foreman, he can see the floors as executed and judge for himself.

Does not this argue that other systems besides that to be universally applied have greater advantages, and the district surveyors or Tribunal of Appeal should have power to approve other methods?

We are of opinion that 4-in. thick cast slabs would be of ample thickness.

HOLMAN & GOODHAM.

LONDON LAMP-POSTS.

SIR.—The time has again arrived when the lamp-posts are again being painted (anyhow in Westminster) with a nondescript khaki colour, which, in a short time, gets a dirty mud colour, and, before the following spring arrives, is almost black. This annual painting which the lamp-posts are subjected to is not only costly, but, if the lamp-post was originally of a fine design with any detail work on it, it is eventually entirely obliterated; all the intricacies being filled up with paint. I have seen lamp-posts with layers of paint on them amounting to a total thickness of over ½ in.

Now that some attention is being given to the beautifying of London, I should like to suggest that the County Council in future have their lamp-posts and supporting-poets for electrical tramway conductors coated in a similar manner to the lamp-posts in Paris, which are beautiful in design and objects of beauty, being of a rich copper-bronze colour. The only attention they require is to be occasionally wiped with a grease composition.

If the County Council were to adopt such a system, it would not only add considerably to the beauty of London streets, as the lamp-posts and standards for the overhead electric tramway wires are such conspicuous objects in the street, but would eventually effect a great economy in upkeep and labour.

SHERARD COWPER-COLES.

Before considering the question of painting, it would be necessary to get lamp-posts of good design, which are hardly to be seen in London. The Westminster Council, to which our correspondent more particularly refers, have covered their district with so-called "ornamental" electric-light posts which are merely vulgar and pretentious.—ED.

CHURCH FITTINGS.

SIR.—This letter will seem belated, but with 7,000 miles of land and sea between Pretoria and London, it cannot very well be otherwise.

I read with great interest the report, in your issues of February 18 and 25, of Mr. C. S. Spooner's paper on "Church Fittings." In his introductory remarks he divided Christian communities into two sections—those who make the Altar or Holy Table the most important feature of their churches, and those with whom the pulpit occupies this position. The first section, Mr. Spooner went on to say, embraces three communions—the Greek, the Roman, and the Anglican. All other denominations belong to the other section. I would like to take exception to this classification on behalf of the Scottish Church. I venture to think it should be included in the first section. Mr. Spooner, I think, has also forgotten the German (Evangelical) Church, with its altar raised high above the level of the nave, and bearing crucifix and rows of candles. In how many Anglican churches is the Holy Table given such prominence?

It is of the Scottish Church, however, that I wish to write. In the modern parish church in Scotland to-day the Holy Table occupies exactly the same position as it does in most English parish churches, i.e., at the end of the chancel, raised on several steps, the pulpit being at the side of the chancel opening. This has not always been so, but neither has it always been the case in England. Where this arrangement does not obtain in Scotland, the least that can be said is that the Holy Table occupies quite as important a position as does the pulpit. This is more than can be said of every parish church in England. I can cite one instance to the contrary with which I am very familiar. It is not in some remote country village, unearthed by the Oxford movement, that it is to be found, but in the centre of the second city of England, Manchester. In the parish church of Christ Church, Salford, the pulpit stands, not to one side of the chancel opening, but exactly in front of the centre of it, completely blocking up the view of the Holy Table. So entirely does it do so that, although I often attended service there with a friend, a parishioner, I have never yet seen the Holy Table.

If Mr. Spooner will visit the Church of St. Columba, Pont-street, Belgrave, the architect of which is the eminent member of the profession, Mr. I. Macvicar Anderson, he will see a typical Scottish church of the present day. He will see the same arrangement as he has described in his paper—the pulpit at the side

of the chancel opening, and the Holy Table raised on several steps above the level of the chancel floor, which again is raised several steps above that of the nave. The Table, which is without any covering—frontals are not usual in the Scottish Church, although they are to be found—is of oak. It is not at all unusual in Scotland for them to be of marble, alabaster, or other stone. To my mind the Holy Table in St. Columba's is much too short—it should be about double the length. In the Scottish Church much longer Tables are required than in the English Church. The double row of stalls which face each end of the Holy Table in St. Columba's are a mistake. They should be removed, and a row of stalls running along the end wall of the chancel, with, if required, a single row of stalls along the side walls, substituted.

What Mr. Spooner will see in St. Columba's will, I think, have the effect of enabling him to include the Scottish Church in the first section into which, in his interesting and instructive paper, he divided the Christian communions.

H. FRANKLIN MACGILLIVRAY.

Pretoria, Transvaal.

April 22, 1905.

AN ACKNOWLEDGMENT.

SIR.—I shall be much obliged if you can spare me in your columns a little space to make the following acknowledgment.

In the Academy this year there is a small sketch design of mine for some suggested new buildings for the University of Liverpool, one facade of which my friend, Mr. Rickards, points out to me is reminiscent of part of the scheme he and Mr. Stokes prepared some time ago for the Holborn to the Strand street. I have looked up their drawing, which appeared in your paper on November 17, 1900, and find it is certainly so in some of its main features. I am consequently very anxious to at once acknowledge the plagiarism. I have a great admiration for Mr. Rickards' work, and I have no doubt, now I see his design again, that portions of it have been running in my mind and have influenced my little sketch. All architects will be able to realise how this can have occurred in perfectly good faith.

The facade in question is the shorter one with the large studio windows in it. It came about, naturally enough, from the repetition of the same features (which are all only the so-called motif of Palladio) in the longer and main facade, but that does not alter the result as far as Mr. Rickards' is concerned.

If my building is ever carried out or my design proceeded with in any way, you may be sure I shall remove all traces of the likeness, and if, in the end, it will bear comparison with any of Mr. Rickards' work, I shall be only too pleased.

C. H. REILLY.

University of Liverpool.

MAPLE FLOORING.

SIR.—Referring to Messrs. Damman & Co.'s remarks in your last issue, my experience is that contractors are not keen on maple flooring; for the reasons set forth.

I am not aware that a plain unpolished surface of oak or teak will bear the rough usage which maple is subjected to in such buildings as factories, sorting offices, etc., where trolleys are used without rubber tyres and with heavy loads.

I maintain that vertical grain maple, of good quality, cannot be surpassed.

BUILDER'S ASSISTANT.

COMPETITION FOR CLOCK TOWER, ST. GEORGE'S-CIRCUS, S.E.

SIR.—The result of this competition was made known about the 19th of last month, and, up to the present, the place and date of the exhibition of drawings sent in has not been published as promised.

I think that, considering the large number of drawings sent in, the promoters of this competition should hold the exhibition without further delay. I enclose my card, and am, Sir, very respectfully,
A COMPETITOR.

ELECTION OF FELLOWS OF THE INSTITUTE.

SIR.—I am instructed to forward you copies of the enclosed resolutions, passed at a meeting of local Associates of the Royal Institute.

FREDK. MUSTO.

Resolutions Passed at a Meeting of Associates:

1. That this meeting of Associates views with much indignation the present large influx of members to the Royal Institute by direct election to the Fellowship, and in view of the facts (a) that many of the candidates are of such a low standard of quality for membership by the "special" examination provided for such cases; (b) that some of them have not been successful in the examinations, are, nevertheless, supported by prominent members of the R.I.B.A. council, we protest against this

as a lowering of the standard required for membership; as a most unfortunate blow to the cause of professional education they profess to encourage; and as a grave injustice to those who have qualified by examination for membership at much expenditure of both time and money.

2. That we urge upon the Associates in London and in all the allied societies to combine in opposing these numerous and unwarranted nominations by demanding a ballot as prescribed in by-law 9, and by all the regular means.

3. That copies of the above resolutions be sent to the R.I.B.A., to the allied societies, and to the leading professional journals.

(Signed)
W. G. SMITHSON. F. E. P. EDWARDS.
W. H. BREVYERS. A. RICHMOND HILL.
H. ASCOUGH CHAPMAN. CHARLES B. HOWELL.
R. FELDING PARKER. J. J. WOOD.
ALBERT E. KIRK. EDWARD I. GUY.
HERBERT E. JILLINGWORTH. Leeds, May 17, 1905.

Illustrations.

SCULPTURE, CENTRAL LIBRARY, HAMMERSMITH.

THE sculptural decoration to the Central Library, Hammersmith, here illustrated, is the work of Mr. F. E. E. Schenck, the architect of the building being Mr. H. T. Hare.

The sculpture consists of two statues of Shakespeare and Milton in two niches in the centre of the building, and two long panels in relief, at a lower level.

The right-hand panel, the uppermost in our illustration, symbolises "Literature" and "Art"; the other panel represents "Industry" and "Science," the two figures being in each case separated by a shield in the centre. The figures of Shakespeare and Milton are, we have ascertained since our plate was made, in the reverse position to that in which we have placed them, Shakespeare being on the right, and Milton on the left; but we think the position in our plate is the one they ought to have had. One reads storied sculpture, as one reads a book, from left to right, and therefore the older (and greater) poet should more suitably have been placed on the left.

The sculpture is executed in Portland stone. The scale of the figures in the niches is 8 ft., and of those in the panels 6 ft. 6 in.

MUNICIPAL BUILDINGS, SOUTH SHIELDS.

THREE buildings are now being erected at South Shields, and occupy an elevated position at the Westoe-road end of the island site known as the Ogle-terrace. The remainder of the site, which is of considerable area, is reserved for other public buildings, as may be developed in the future. Provision is made in the scheme for future extension which may be effected in a variety of ways.

Shortly described, the accommodation in the present building will comprise, on the ground floor, offices for the town clerk, borough surveyor, borough accountant, medical officer of health, and inspector of nuisances, as well as accommodation in Broughton-road for the weights and measures staff.

The basement will contain strong rooms and store room for the various departments, also spare rooms, which might in emergency be used by the officials.

The first floor will comprise the council chamber, ante-room, mayor's parlour, cloak-room, and writing-rooms for the members of the council, three committee rooms, a special suite of offices, and caretaker's quarters.

The construction will be of the most permanent and durable character and fireproof throughout. The principal elevations will be faced with stone from quarries in the Newcastle district, the bank elevations with stone dressing and approved local bricks. The staircases and halls will be ashlar faced and the corridors treated in character therewith.

The window-frames and sashes to principal rooms will be of teak and the principal rooms finished with oak with wainscot panelling.

Owing to the nature of the sub-soil a special construction has been designed for the foundations, in compliance with certain tests made on the ground, and the weights distributed in accordance therewith. In conjunction with this work, in addition to the iron glass enamel system of drainage for the disposal of sewage, a system of agricultural drainage has been designed.

In the architectural treatment of the exterior

an endeavour has been made to suggest the relative importance of the different portions of the buildings. The tower has been placed on the important angle of approach and will be seen from the top of Fowler-street, so that it will be much more conspicuous object up the hill from the town, than if placed in the centre of the station-road facade. The upper part will receive a three-parts chiming tower clock, with dials glazed for illuminating purposes.

In the sculptural embellishments of the exterior subjects emblematic of the industries of the borough will be introduced.

The contract has been let to Messrs. Neill, of Manchester, at £7,900.

The drawing from which the illustration is here hung at the Royal Academy. As we remarked, in our article on "Architecture at the Royal Academy," on the rather gloomy effect of the drawing, we may add that the architect tells us that it was coloured to represent the materials to be used in the construction, "as modified by local atmospheric conditions."

LAMBETH MUNICIPAL BUILDINGS COMPETITION.

We publish this week the perspective view and plans of the first premiated design for Lambeth Municipal Buildings, by Mr. S. Warwick and Mr. H. A. Hall, and the perspective view of the second premiated design, by Mr. P. Burke Downing.

FIRST PREMIATED DESIGN.

The following are the architects' notes in explanation of the intention of their design:—

General Arrangements.—The buildings are arranged on the site as to use the angle to advantage and leave the utmost room at the rear without having to cramp the present buildings. The main entrance and grand staircase are placed at the corner of Brixton-hill and Acre-lane, as being the most convenient position having regard to the station close by. This arrangement also lends itself to a satisfactory treatment of the angle. The council chamber, rates office, and rates appeal office are placed on the main axis of the buildings, where they are easily accessible from their respective entrances, and are well lit and free from noise. All the rooms of the several departments are grouped together, and the sizes are in every way those required.

Exterior.—The elevations are treated in a free classic manner in Portland stone and red brick. A tower is designed to accentuate the main entrance and add dignity and importance to the whole building.

First Floor Arrangements.—On the first floor the corridors branch off from the head of the grand staircase with committee-rooms on either side, and lead to the council chamber, which is not equally accessible from both corridors. The ante-room forms a spacious division lobby and makes access convenient throughout the main council rooms.

Materials.—The elevations to be carried out in white Portland stone and red bricks—six courses to the foot with wide joints. The roof to be covered with green Tilberthwaite slates. The whole of the work to be fire-resisting throughout. The grand staircase to be in English Wood stone, with polished balustrades and dado of the same material. The main landing to have a domed ceiling, with coffered piers and enriched panels. The council chamber to be paneled in oak and to have marble columns and segmental plaster ceiling over. The committee-rooms to be paneled in fumed pitch pine, and to have segmental plaster ceilings.

SECOND PREMIATED DESIGN.

In explanation of this design, Mr. Downing writes:—

"Of the two frontages which the site possesses due to the fine thoroughfare of Brixton-hill is obviously marked out for the principal elevations of the building. The crowded corner at Acre-lane is as obviously unsuited for the main entrance to a public building of this nature, and the main entrance has, therefore, been placed in the centre of the frontage to Brixton-hill. With the ample area available, requisite accommodation could, without difficulty, be provided on two floors in addition to the basement, so that a lofty building would not be unnecessary.

Our considerations, amongst others, have favored the adoption of the style in this design, and it is hoped that in the result a monumental character and sober dignity, suited to its purpose, has been given to the

building. The limit of expenditure does not allow of the building of a tower, which might have formed a special feature, but it would provide no additional accommodation proportionate to its cost, and even as a clock tower, having regard to the nearness of St. Matthew's Church, would have been of no public utility. While, therefore, the corner has been suitably emphasised by particular treatment in the design, it has been dealt with as a continuation of the main elevation."

COMPETITIONS.

MUNICIPAL BUILDINGS AT LAMBETH.—Lambeth Borough Council on Thursday, the 11th inst., considered the award of the assessor (Mr. Henry T. Hare, F.R.I.B.A.), with reference to the open competition for designs for municipal buildings at Brixton-hill and Acre-lane, Lambeth, to cost not more than £5,000. The General Purposes Committee reported that they ventured to express their agreement with Mr. Hare's opinion—viz., that the Council had every reason to congratulate itself, first, on the response of architects to the invitation to compete, and next upon the high standard which most of the designs had attained, while several possessed very considerable merit. The assessor placed No. 66 first, and Nos. 75 and 94 second and third. Continuing, the report stated:—

"Having heard Mr. Hare's explanations and advice, and having had the benefit of a personal inspection of the designs under his guidance, we unanimously decided to recommend the Council to accept Mr. Hare's award, and to adopt the design placed first by him, subject to the conditions of competition, and to a satisfactory tender being hereafter received."

The Council having adopted the Committee's recommendation, the sealed envelopes containing the names of the competitors were opened, and it was found that the authors of No. 66 were Messrs. Warwick & Hall; that the author of the second design (who will receive 200*l.*) was Mr. Burke Downing; and the authors of the design placed third (who will receive 100*l.*) were Messrs. Crouch, Butler, & Savage. Thanks were expressed to Mr. Hare for bringing the competition to so successful an issue.

SCHOOLS, DARELL-ROAD, RICHMOND.—The Education Committee of the Richmond Town Council has presented a Report on the plans for this school, which is to accommodate at present 500 children. The architects had been instructed so to design the building as to admit of the enlargement necessary to accommodate eventually 1,000 children, without spoiling its uniformity. Alderman Edgar moved the approval of the set of plans and designs No. 2. This was adopted, as also the recommendation that No. 4 plans be placed second in order of merit. The Mayor then opened the sealed envelopes, and it was discovered that the author of No. 2 was Mr. E. J. Milner Allen, 24, Ladbroke-gardens, London, and the author of No. 4 was Mr. C. Harrison Townsend, 32, Great George-street, Westminster. On the suggestion of Councillor Banks, it was agreed that the various plans should be on view in the Town Hall, and that all competitors should be invited to come and see them. There is no mention made of an assessor in deciding the competition.

NEW CEMETERY, WILMSLOW.—The Wilmslow District Council met on the 15th inst. to decide upon designs and plans for their new cemetery. They had offered premiums of 25*l.*, 15*l.*, and 10*l.* Mr. H. Beswick, Cheshire County architect, was the assessor, and his awards were:—(1) W. Longworth (Manchester); (2) H. C. Cullock (Manchester); (3) C. T. Taylor (Oldham). The Council's Cemetery Committee recommended Mr. Taylor's design as the most suitable for Wilmslow, and the Council accepted this with one dissentient.

BOOKS RECEIVED.

ITALIAN ARCHITECTURE. By J. Wood Brown. Langham Series of Art Monographs. (A. Siegle. 1*s.* 6*d.*)

CONCRETE: PLAIN AND REINFORCED. By F. W. Taylor and Sanford E. Thompson. (Chapman & Hall.)

THE ROCK TOMBS OF EL AMARA. Part II. By N. de G. Davies. (Egypt Exploration Fund.)

ETHASYA: 1904. By W. M. Flinders Petrie. (Egypt Exploration Fund.)

ROMAN ETHASYA: 1904. Plates and text supplementary to "Ethasya." By W. M. Flinders Petrie. (Egypt Exploration Fund.)

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE-STEEL.—XX.

TRANSIT SHEDS: MANCHESTER SHIP CANAL (continued).



CONTINUING our description of the floor system in the transit sheds, we may first call attention to Fig. 134, which shows a column connexion, part of a main beam, two cross-sections of a secondary beam, and a section of the floor slab. Fig. 135 is the cross-section of a secondary beam near the support, where the middle two longitudinal bars are bent in an upward direction, for the purpose we mentioned last week when describing the construction of the main beams.

After the concrete of the main and secondary beams had sufficiently set, a 1-in. layer of concrete was spread over the centring, and upon this the first series of rods of the reinforcement for the floor slab was laid out. These rods, ranging from $\frac{1}{2}$ in. to $\frac{3}{4}$ in. diameter, were spaced 12 in. apart, in rows parallel to the secondary beams. A second 1-in. layer of concrete was spread over the rods, and the second set was then laid out, 6 in. apart, transversely to the first set.

Concrete was next deposited to the thickness of 2 in., in three strips, one 24 in. wide midway between and parallel with two adjacent joists, and one 12 in. wide next to each of the side joists of each floor panel. Thus, in each span of 8 ft. between the joists there were three ridges and two hollows, over which the third series of rods was laid, 6 in. apart, each rod being bent to fit the contour of the concrete.

The hollows were next filled up and enough concrete was added to cover the raised parts of the rods, the material being thoroughly tamped down. After this operation the fourth and last series of rods was laid at right angles to those previously fixed. A final layer of concrete was added, and, after being rammed and levelled, made the slab 5 in. thick. As the work progressed the projecting ends of the beam stirrups became incorporated in the floor slab, which, extending continuously over the beams and joists, thereby increased the total depth of those members to 23 in. and 19 in. respectively. In every case the rods laid in the floor slab project over their supports by at least 6 in., and the ends are bent over to secure good anchorage. The details of the construction here described are represented in Fig. 134.

All the walls of the sheds are built entirely of concrete-steel, and, as they carry no load whatever, it was not necessary to make them more than 4 in. thick. It should be noted, however, that the north fronts of the sheds have no walls, strictly speaking, but are provided with cast-iron sliding doors, fitted with rollers, running on top and bottom guides. The method adopted in building the walls was to erect a network of thin steel rods between adjacent columns at the ends and back of each shed, and then to fill in concrete by the aid of suitable moulds, built up of boards as the work proceeded.

On the first and second floors an opening 12 ft. wide was left in the middle of the wall at each end of every shed, giving access to the gangways connecting the adjacent warehouses (see Figs. 129 and 130). Two other openings were provided at each end wall on either side of the gangway, as shown in Fig. 130, these being intended to facilitate the loading and unloading of vans and lorries, by means of 30-cwt. electrically-driven hoists fixed on the roof.

Reference has already been made to the five towers at the back of each shed. As shown in Fig. 137, they project a considerable distance beyond the face of the building, and extend from the level of the first floor to a height of some feet above the roof level, being supported on massive cantilevers of concrete-steel. The upper part of each tower is extended for about 10 ft. over the flat roof of the shed, and under the roof of each tower an electrically-driven hoist is fixed on two 16-in. rolled steel joists 22 ft. long. Concrete-steel columns of special design are built into the walls for the purpose of helping to support these joists.

The towers are perfectly open from the bottom to the roof, being intended for the hoisting of perishable goods under cover from vehicles below, or from one floor to another,

or for loading up vehicles with goods passing through or stored in the sheds. The towers are about 12 ft. square, and have 4-in. walls of concrete-steel, in which windows are provided on each story, as shown in Figs. 137 and 129 ante.

The balconies built between the towers at the level of the first floor also provide shelter for vans waiting their turn to pass under the hoists in the towers or being loaded at additional loading stations, provided by doors in

the wall of the building and openings through the floor of the balcony.

The cantilevers supporting the towers and balconies are illustrated in Fig. 136, and have a projection of 12 ft. Most of them are 20 in. deep at the free end, but the depth is varied according to the load to be carried, there being three standard types of construction for different parts of the buildings, the maximum depth being 2 ft. at the outer end and 6 ft. 6 in. at the supporting column.

As shown in Fig. 136, the reinforcement includes three systems of bars—one series at the top consisting of four horizontal bars $1\frac{1}{2}$ in. diameter, these being continuations of the bars in the secondary beams of the first floor; another series at the bottom consisting of six $1\frac{1}{2}$ -in. diameter bars, coming up from the wall, and bent out so as to follow the curve of the cantilever; and one series consisting of $1\frac{1}{2}$ -in. diameter bars, anchored into the wall and connecting the first two series in a direction

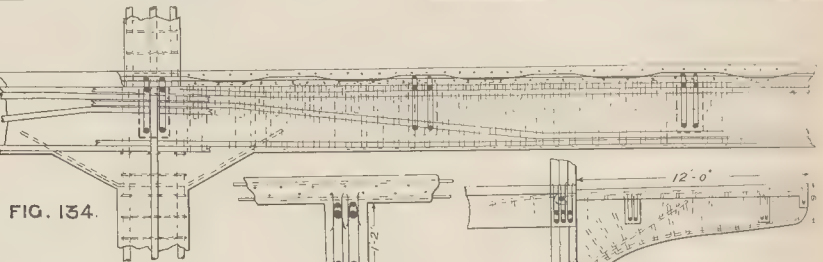


FIG. 134.

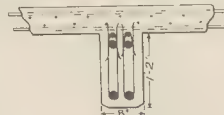


FIG. 135.

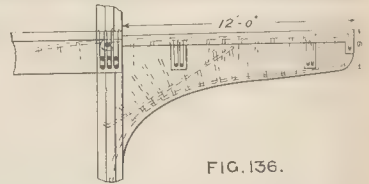


FIG. 136.

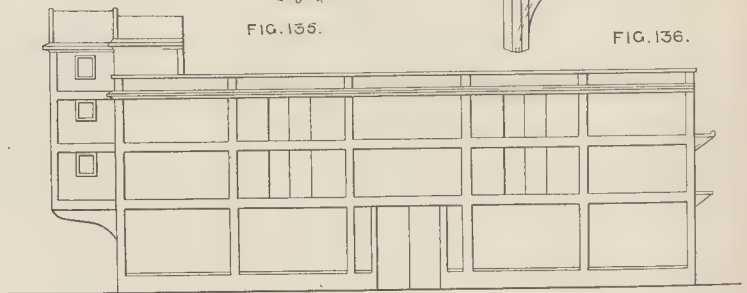


FIG. 137.

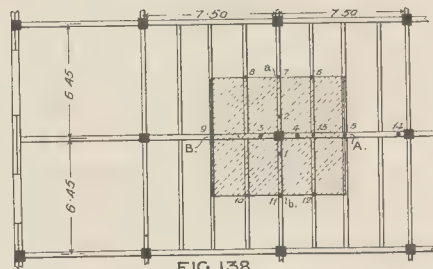


FIG. 138

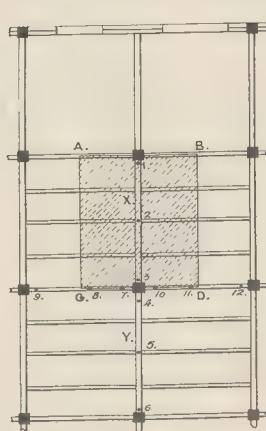


FIG. 139.

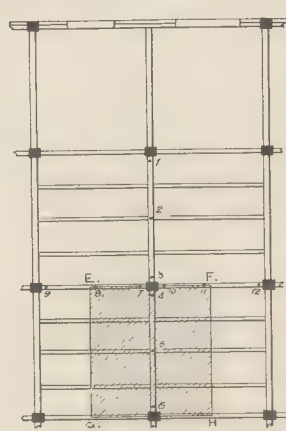


FIG. 140.

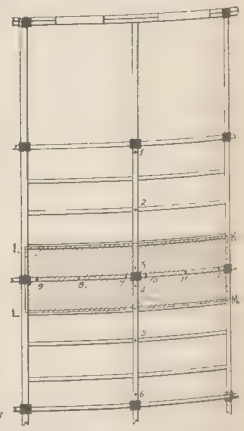


FIG. 141.

Illustrations to Student's Column.

... to the curve of the cantilever close to the column. Two bars of the upper set are embedded for about 3 ft. into the beams of the first floor and the other two are hooked around horizontal bars inserted in the wall beams. Two systems of stirrups are employed in addition to the bars, for the purpose of resisting shearing stresses, the manner in which they are disposed being indicated in Fig. 136. The cantilevers are connected laterally by beams running parallel with the wall of the building, and over these is a floor slab of concrete-steel.

Each shed is provided with three stairways, placed at each end and in the middle of the building, as indicated in Figs. 129 and 130. Each staircase includes forty-eight steps, twenty-two between the ground and first floors, twelve between the first and second floors, and twelve between the second floor and roof. The balustrades, treads, and all other details of these staircases are of concrete-steel.

At the front of each shed a loading balcony, with a projection of 4 ft., is provided at the level of the first floor (see Fig. 137), being raised by concrete-steel cantilevers with a section nosing, so as to prevent injury by the accidental contact of goods being hoisted or moved. Above this balcony a series of platform six lifting platforms extends along the front of the sheds at the level of the second floor. These platforms, which are hinged so that they can be lifted up when not in use, are made of pitch pine with oak framing, and are lowered and supported by the iron brackets shown in Fig. 137. Similar hinged platforms are provided at each story in front of the sheds giving access to the hoisting towers.

Being built entirely of concrete-steel, the sheds themselves are incombustible, but for the purpose of enabling the officials to isolate any local outbreak of fire in the goods stored, the sheds are divided in the most efficient manner, various floors of each shed are divided into parts by a 4-in. concrete-steel party wall, extending from front to back. In each party wall there are two openings 12 ft. wide, fitted with double sliding doors, these and all other details in the buildings being of fire-resisting construction.

The parapets along the sides and back of the sheds are formed by a continuation of the concrete-steel outer walls. These parapets are 4 ft. high, and inside them runs a concrete-lined rain-water gutter. The parapet at the front of the sheds is of cast iron, secured by tension bolts let into the concrete below, and the reason for the choice of this material is very apparent. Concrete foundations have been built on the roof, between the bridge and the front parapet, for the 30-cwt. electrically-driven hoists previously mentioned.

The bridges, or gangways, connecting the adjacent buildings are about 24 ft. long by 12 ft. wide. Each bridge is supported upon rolled steel joists, 16 in. deep, connected by 1½-in. diameter tie-bars. The decking and other details of the bridges are composed

entirely of reinforced concrete, and it should be noted that the concrete is quite separated from that of the sheds, gaps 1½ in. wide being left at each end to provide space for expansion in hot weather.

One interesting feature in connexion with the design and construction of these buildings was the very complete manner in which provision was made for embedding bolts, hooks, and other fastenings for the attachment of various structural details and for forming conduits to receive pipes and electric-light wires. Provision for the numerous fastenings had to be made in the timber moulds for the beams and other members. In some places it was necessary to insert timber blocks, so as to form holes in the concrete, wherein the fastenings could be caulked with cement, and in other places the fastenings themselves had to be inserted through the sides or bottom of the moulds. Owing to the great number of the

The floors and flat roof of each shed are finished with asphalt. On the ground floor there are two ½-in. layers of this material laid in sheets with overlapping edges, on the first and second floors ¾-in. layers, and on the roof two 1-in. layers with overlapping edges.

In concluding this description of the sheds, we cannot do better than give some results obtained during the tests which were conducted on the columns and floors in March, 1904.

We will first take the test of a column on the second floor. The area covered by the load is indicated in Fig. 138, and the results of the tests are given in Table I. Fourteen instruments were employed for the measurement of deflection, the positions of these being shown by numerals on the plan.

All the floors and the flat roofs were calculated for a normal load of 1,875 kilogrammes per square metre (384·37 lb. per sq. ft.), and were tested to one and a half times this load—

TABLE I.—TEST NO. 1, UPON A COLUMN ON THE SECOND STORY OF SHED NO. 5 (SEE FIG. 138). TEST LOAD, 140 TONNES.

(All Readings are given in Millimetres.)

Numbers of Instruments.	Readings Taken During Loading.					Readings Taken During Unloading.						
	Before Loading.	At 45 tonnes.	At 90 tonnes.	At 140 tonnes.								
	Morning.					Afternoon.						
	8h. 40m.	9h. 40m.	10h. 50m.	11h. 50m.	2h.	2h. 15m.	2h. 30m.	2h. 45m.	3h.	3h. 35m.	4h.	
1	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	
2	2·0	2·2	2·5	3·0	3·0	Maximum Compression.						
3	2·0	2·2	2·5	2·5	2·5	—	—	—	—	—	—	
4	2·0	2·4	2·9	3·3	3·3	3·3	3·0	2·7	2·3	1·5	1·6	
5	2·0	2·3	2·8	3·1	3·4	Deflection of Main Beam (B)...						3·1
6	2·0	3·0	4·4	6·0	6·2	" (A)...						2·0
7	2·0	3·0	4·0	6·2	6·3	" " " " " " " " " " " "						—
8	2·0	2·8	4·0	5·0	5·0	Deflection of Secondary Beam (a)...						2·4
9	2·0	2·2	4·3	5·3	5·4	5·4	4·4	3·4	2·0	0·5	0·5	
10	2·0	2·8	3·6	4·9	4·9	Deflection of Secondary Beam (b)...						1·9
11	2·0	3·2	4·5	6·2	6·2	—						—
12	2·0	2·8	4·1	5·5	5·6	—						—
13	2·0	2·2	2·4	2·9	2·9	—						—
14	2·0	2·2	2·4	2·9	2·9	—						—

different attachments and the immense variety of size and shape, considerable care was necessary to avoid mistakes.

Provision for running electric-light wires was made by embedding tubes in the concrete near the upper surface of the floor beams. These tubes were filled with dry sand so as to enable them to withstand the weight of the concrete, the ends being sealed up with plaster of Paris. After completion of the concreting, the ends of the tubes were unsealed, and the sand being removed, the conduits were ready for wiring.

The main cables for the supply of electricity for power and light are suspended from the under side of the floors by means of eye-hooks screwed into blocks of wood, which were set in the beams during construction, as described above.

namely, to 2,800 kilogrammes per square metre (574 lb. per sq. ft.). As representative examples of the tests, we have selected three which were conducted upon main and secondary beams on the second story. The areas covered by the loading are shown in Figs. 139, 140, and 141, and the results are given in Table II.

Tests Nos. 2, 3, and 4 were conducted thus:—The area ABCD (Fig. 139) was first loaded up to 45 tonnes, then to 90 tonnes, and finally to the full test load of 140 tonnes.

The area EFGH (Fig. 140) was first loaded by the transfer of 45 tonnes from ABCD, then 45 tonnes and 50 tonnes were successively transferred from ABCD, making up the full test load of 140 tonnes. Thus, when the load of 45 tonnes was on EFGH, 95 tonnes still remained

TABLE II.—FLOOR TESTS ON THE SECOND STORY OF SHED NO. 5.

(All Readings are given in Millimetres.)

Test No. 2, Fig. 139.										Test No. 3, Fig. 140.										Test No. 4, Fig. 141.																																	
Readings from the Instruments.										Readings from the Instruments.										Readings from the Instruments.																																	
Before Loading.		At 45 tonnes.		At 90 tonnes.		At 140 tonnes.		Deflection.		At 45 tonnes.		At 90 tonnes.		At 140 tonnes.		Deflection.		At 45 tonnes.		At 90 tonnes.		At 140 tonnes.		Normal Load.		After Unloading.																											
March 17.																		March 18.										March 19.																									
Morning.					Afternoon.							Morning.						Afternoon.					Morning.					Afternoon.																									
8h.	12h.	4h	30m.	7h.	9h.	10h.	30m.	11h.	40m.	1h.	45m.	3h.	5m.	4h.	5m.	7h.	8h.	9h.	10h.	11h.	12h.	30m.	10h.	mm.	mm.	mm.	mm.	mm.																									
22	26	35	35	41	4·2	8·7	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																									
23	26	35	35	41	4·2		12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																									
24	26	35	35	41	4·2		12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																									
25	26	35	35	41	4·2		12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																									
26	26	35	35	41	4·2		12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																									
27	26	35	35	41	4·2		12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																									
28	26	35	35	41	4·2		12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																									
29	26	35	35	41	4·2		12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																									
30	26	35	35	41	4·2		12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																									
31	26	35	35	41	4·2		12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																									
32	26	35	35	41	4·2		12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																									
33	26	35	35	41	4·2		12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																									
34	26	35	35	41	4·2		12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																									
35	26	35	35	41	4·2		12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																									
36	26	35	35	41	4·2		12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																									
37	26	35	35	41	4·2		12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																									
38	26	35	35	41	4·2		12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																									
39	26	35	35	41	4·2		12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																									
40	26	35	35	41	4·2		12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																									
41	26	35	35	41	4·2		12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																									
42	26	35	35	41	4·2		12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																									
43	26	35	35	41	4·2		12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																									
44	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
45	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
46	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
47	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
48	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
49	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
50	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
51	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
52	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
53	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
54	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
55	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
56	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
57	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
58	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
59	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
60	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
61	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
62	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
63	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
64	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
65	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
66	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
67	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
68	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
69	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
70	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
71	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
72	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
73	26	35	35	41	4·2	12·9	3·6	3·0	2·2	2·2	3·8	3·0	2·2	2·2	2·2	2·2	2·4	2·4	2·3	2·0	2·0	2·0	2·0	2·0	2·0	2·0	2·0																										
74	26	35	35	41	4																																																

A similar method of procedure was followed in transferring the load from the area EFGH to the area IKLM (Fig. 141).

During the loading of ABCD the beam Y, which is a continuation of the beam X, indicated an inverse deflection, being bent in an upward direction. The same effect was produced in X while Y was under load. It should be noticed that the floor areas tested exhibited remarkable elasticity.

The mean deflection shown by tests Nos. 2 and 3 measured only 8.7 millimetres and 8.6 millimetres respectively. As the permissible amount of deflection was 12.1 millimetres, these results are very satisfactory. The mean deflection observed in test No. 4 was 5.5 millimetres, the permanent set after unloading being inappreciable.

COST OF LUNATIC ASYLUMS

At the annual meeting of the County Council Association, held at the Westminster Guildhall, on Wednesday, under the Chairmanship of Sir John Hibbert, Mr. J. Willis Bund (Worcestershire County Council) brought forward the question of the unnecessary expenses occasioned by the requirements of Government departments, especially in connection with lunatic asylums and isolation hospitals. He said there appeared to be a ring in regard to these asylums. There were certain architects who gave a great deal of attention to the matter, and they were well known to the Lunacy Commissioners. If the local authority did not go to one of these architects, their life was made a burden to them. If they went to one of these architects things went smoothly. The architect advised and the local authority acquiesced. "I know So-and-so, and he is a very good man," and the committee immediately took Mr. So-and-so. The Lunacy Commissioners did not give any standard of what they wanted, or any idea what contractors could carry out, and unless they went to these people they could not get their plans approved, and thus the contractors were enabled to make a profit in competition. That was the great evil of the present system. He did not know how it was to be altered, but he did believe that a perfectly good lunatic asylum could be put up at much less cost than at present. The fact was that the Poor Law Authorities built most spacious workhouses, and there was a kind of rivalry between the Local Councils and the Poor Law Authorities and the Lunacy Commissioners' inspectors, and one tried to go one better than the other.

Lord Ripper said that undoubtedly pressure was brought upon authorities to employ the architect connected with the Lunacy Commissioners, and there was the greatest difficulty in getting plans passed at all except those of the architects suggested by the Commissioners. The whole pith of the question lay in this, that so long as the responsibility of the Lunacy Commissioners was allowed to take jobs to build asylums, or to be employed as one of the architects recommended by the Lunacy Commissioners, so long would the difficulty remain. He could not, at a meeting like that, give particulars of his own experience, but he had said that some of the obligations put upon his county by the Lunacy Commissioners were quite unreasonable. The matter was one of great importance if the system which prevailed when he went to the Commissioners still existed, for they might be brought to ask for a dividend in respect to the Lunacy Commissioners should not himself be allowed to take jobs and build asylums.

allowed to make you all the way. Sir H. K. P. said that some difficulty was experienced in connexion with the engineers of the Local Government Board, for it was quite impossible or extremely difficult to get any sewage or sanitary scheme passed unless it was worked out in conjunction with an engineer upon the list of that authority. He thought the whole question of these officers taking work demanded the most serious attention of the heads of departments.

Mr. Parry said that the Newport Corporation chose their own architect for an asylum, and were treated with the utmost courtesy by the Lunacy Commissioners.

The meeting passed a resolution calling attention to the unnecessary expense occasioned by the unnecessary requirements of Government departments, especially in connexion with lunatic asylums and isolation hospitals.

QUEEN VICTORIA MEMORIAL, YORK.—The memorial statue of the late Queen Victoria for the City of York has now been completed. The commission for the memorial was entrusted to Mr. George W. Milburn, sculptor, York.

SOCIETY OF ARTS

At a meeting of the Society of Arts on the 16th inst., Mr. E. Hall described the recent discovery made by Mr. Naville and himself at Deir-el-bahri, near Thebes, of a temple of the XIth dynasty, built for the King Mentu-hetep about 2600 B.C. It was discovered close to the much larger and later temple built by Queen Hatshepsut as a tomb for her father, Thotmes I., of the XVIIIth dynasty. Mr. Hall showed his own very fine slides of the temple, and formed an impressive picture, such the white colonnades are seen standing at the foot of an enormous red cliff. It was first examined by Mariette, and is in remarkably good preservation.

The subject of the evening, however, was more particularly the excavations which have been recently undertaken a little to the left of this, and at a lower level, and which have resulted in the unearthing of a smaller temple of the XIIIth dynasty. The oldest part found in these excavations consists of a stone which Mr. Hall supposed to have been the base of a pyramid, standing on a platform surrounded by colonnades of columns of the Proto-Doric type. The actual tomb of King Mentu-hotep has not yet been discovered, and the lecturer did not suppose that the old sepulchral chamber was symbolic. The columns supporting the colonnade are octagonal, those of the outer, square, and at a lower level. The height of these seems to have been about 12 ft., but few of them are complete. Between the two a wall, remarkably rich in relief carvings, was discovered. In the older work the masonry was of large, fine-jointed blocks as large as 6 ft. by 4 ft. The latter stonework, added in the XVIIIth dynasty, is not so good. Hatshepsut's temple appears to have been built partly on the top of some of the walls of the older building, and one wall of the masonry discovered ran right under the Hathor shrine of the temple. The temple is approached by a ramp, and at the entrance a great granite threshold, 9 ft. long, was discovered still showing the socket in which the great bronze gate formerly moved. Excavated in the rock of the platform were found a number of tombs of priests, the oldest of which places the passing of these tombs was supplied with rough logs of timber, very possibly, Mr. Hall said, coeval with the temple, the dry climate having prevented its decay. Unfortunately these tombs have been rifled by plunderers at some remote period, but a number of articles of great interest have been found, including a few of the limestone sarcophagi of the priestesses of Hathor, discovered with reliefs executed in a fine though rather stiff manner, of scenes in her life. Hathor, who is generally represented in the form of a cow, figures prominently. The most curious objects, however, were the small models of workmen at work at breweries and bakeries, of which the lecturer showed slides. A fine alabaster head of a cow, representing Hathor, was also found, the carving of which is magnificently executed. One interesting fact about these is that it is known that they were executed by the artist, Mertisen, and his school, who appear to have begun their work about this time. The lecturer concluded by referring to the need for further subscriptions to the Egypt Exploration Fund in order to carry on the work.

A spirited discussion followed, in which Mr. Somers-Clarke, Mr. Stannus, and Mr. Phené Spiers took part, as to whether the temple of Hatshepsu was copied from the earlier temple, Mentu-hetep, or not. The point, however, remained finally unsettled, the general opinion being that it was not. The lecturer, however, maintained his opinion that it was.

THE RESTORATION OF HEXHAM ABBEY.—A

meeting of the Hexham Abbey Restoration Committee was held on the 11th inst. in the vestry of the Abbey Church, Hexham, the Rev. E. S. Savage, rector, presiding. Mr. Temple Moore, architect, waited upon the committee and laid his plans for the building of the nave before them. Mr. Moore explained that his plans had been submitted to and approved by three consulting architects, and were adopted by the committee. Mr. Moore was directed forthwith to prepare estimates for the work. The committee also resolved to proceed to obtain the faculty to enable them to carry out the work. The proposed agreement with the County Council for the removal of the stables, etc., in the police yard, was considered and agreed to, subject to certain conditions. Attention was called to the corner of the north-west corner of the north transept, and Mr. Moore was directed to give that matter immediate attention.—*Newcastle Journal*.

OBITUARY

Mr. W. Crozier.—We have the regret the death, in his 76th year, of Mr. William Crozier, M.Inst.C.E., on Friday, the 12th inst., of this borough, where he has resided since 1888 when, owing to ill health, he resigned the office of Surveyor, Engineer, and Architect for the County of Durham, after holding that office under the County Quarter Sessions nearly thirty years. Mr. Crozier was a native of the borough, and served as a member of the Engineer with Mr. R. Nicholson, M.Inst.C.E. Newcastle-on-Tyne, and immediately on the completion of his articles was in 1851 selected out of a great number of candidates a Borough Engineer and Surveyor of Sunderland. Ordnance maps were not then in use and he made a complete trigonometrical survey of the borough, and carried out all the sanitary and architectural works. In 1859 he was elected County Engineer and Architect for the County of Durham, and up to 1880 he enjoyed a large private practice, carrying out many engineering and architectural works. He reconstructed the Assize Courts at Durham and the Moot Hall, Newcastle, and was the principal architect of the new County House. When Mr. Crozier was appointed the Durham County Lunatic Asylum for 300 patients was being built, and was enlarged under his superintendence to accommodate 1,300 patients, including a auxiliary asylum for 400 chronic cases, built at a cost of upwards of 40,000*l.* Crozier was a member of the Institution of Civil Engineers, and in 1902 he was elected a life member of the Institution. He leaves a widow and two sons, one of whom has held his appointment since his retirement.

GENERAL BUILDING NEWS

RESTORATION OF SELSTON CHURCH, NOTTING

CHANCEL. EASTLEIGH CHURCH.
chancel has been erected
which the seating capacity
increased by 250. The work
twelve months ago, has
Messrs. Wm. Parmenter & Co.,
Essex, to plans prepared by Sir Arthur

and Son. The chancel is built of Berry-stone, with Bath stone dressings, the exterior being treated also with Bath stone. The chancel window has seven lights with tracery and spandrels, beneath which is a large window, ready for the fitting of a reredos. The chancel and sanctuary floors are laid in a mosaic of green pattern, with Maltese cross and other designs worked in. The walls are of oak, and the super altar is of white marble. The choir stalls are of oak with carved finials. Beneath the chancel window is a credence piscina. The organ-chamber is situated in the arcade. The design of the cornice is from York Minster, whilst the arches are finished with lime stucco. The windows are of cathedral-tinted glass, and the roof is of oak-board with oaks. The tender for the hammer beams is a new organ, built by Hele & Sons, 4, Abchurch Lane, London, and Exeter, has been added.

CHURCH, WHITWICK.—The foundation of the new Church of the Holy Trinity, which is being erected on the site of the Parson Wood Hill, was laid recently. In the new church, the nave will be 54 ft. by 61 ft., the aisles will be north and south aisles, and the nave by an arcade of fine stone. The chancel is to be 30 ft. by 22 ft., and the east end by an apse, providing accommodation for a choir of 12, and sedilia. The north and south aisles are intended to be used as side chapels. The baptistry is placed off the second aisle of the nave. At the west end the principal entrance porch is to be erected, and will be a south porch. The roof will be of open timber. The building will be of the 13th century in style, and carried out in Whitwick Colliery sandstone bricks, with stone stone dressings. The floors at the chancels, and porches will be of ornamental ceramic or encaustic tiles. Through funds it has been decided not to proceed with the upper stages of the chancel, and north chapel. The church is to accommodate 600 persons, and the total cost is estimated at 5,000. The work is being carried out by Mr. Walter Moss, contractor, under the supervision of Messrs. Huxley & Co., architects and surveyors, Whitley Bay.

MART'S CHURCH, GARDEN-PLACE, ABERDEEN.—An addition is about to be made to this church, the congregation having resolved to proceed with the erection of a hall and choir, from plans prepared by Mr. Arthur Huxley, architect. The hall and vestry, which will be built on the south side of the church, towards Albert-terrace, will be carried in harmony with the architectural character of the church. The successful contractor is as follows:—Mason, Mr. James Huxley, carpenter, Mr. Alexander Hall; mason, Mr. J. T. Ross; slaters, Messrs. Huxley & Co.; plasterers, Messrs. Bannochie & Co.; painters, Messrs. Donald & Sons.

CHURCH, LLANDUDNO.—This church is to be re-roofed, as the present roof has shown signs of instability. Mr. Edwin Turner, architect, has prepared the plans for the work.

CHURCH, GRIMSBY.—The foundation of St. Aidan's Church, Grimsby, were laid a short time ago. The new building will be of red brick, with Bath stone dressings. Its length will be 136 ft. with a width of 60 ft., and it will accommodate 700 persons. The church will consist of a nave, aisles, a chancel, a morning chapel, a vestry, an organ-chamber, and a vestry. The buildings are composed of a raft of solid timber, strengthened by iron girders. The architect is the builder, and Mr. W. T. Green is the contractor for the stonework. Mr. C. Huxley Fowler, F.S.A., of Durham, is the architect. The cost will be between 8,000.

CHURCH, EXETER.—The new church in St. Sidwell's, Exeter, has been opened. The opening of the building was the completion of the scheme started in 1898, of which the class and school rooms were the first instalment finished in the following year. The design for the whole was that submitted by the trustees in a limited competition held in 1898, and submitted by the joint architects, Mr. Fred. J. Commin (Commin, Huxley & Bally), of Exeter and Westminster, and Mr. Walter B. Coles, of Exeter. The contractors for the joinery work throughout the building, with the exception of Mr. Huxley & Co., are Messrs. Westcott, Austin, & White, of Exeter, but the general construction has, for a part, been carried out by the trustees of the building, with the assistance of Mr. Huxley & Co., as clerk of works, and a staff of local workmen. The building has been erected with local materials, and by local labour. The

heating, on the small bore principle, together with the electric lighting, has been carried out by Messrs. Wippell Brothers & Row.

WESLEYAN CHURCH, CHORLEY.—The memorial stones of a new Wesleyan church were laid recently at Chorley. The new building will have a frontage of brick, with stone facings, and will seat about 400 persons. The cost is estimated at 2,300. The architect is Mr. W. H. Dimsley, Chorley, and the contractor Mr. L. Fairclough, of Adlington.

BAPTIST CHURCH, CHADWELL HEATH.—A new Baptist church is being erected at Chadwell Heath. The new building is situated on the south side of the High-road, and it will provide accommodation for about 270 persons. The cost, including land and furniture, will amount to about 2,000. The architect is Mr. F. G. Fauchon, of Ilford.

COUNCIL SCHOOLS, EALING.—The new Council schools in Little Ealing-lane are now nearing completion, and the infants' department was inspected by members of the Council Education Committee and Managers recently. The buildings are the outcome of an architectural competition, in which a selected number of architects were invited to submit designs. The education Committee decided last year to repeat the schools designed for the site at South Ealing on a similar site on the Marder Estate, West Ealing. Each of these groups consists of two main school buildings, a senior school of two departments for 400 boys and 400 girls, and a separate mixed school for 446 infants. These buildings are all on one floor. The site at South Ealing has an area of about 2 acres, with frontages to Little Ealing-lane and Weymouth-avenue. The senior school, for boys and girls, is placed on the north-east part of the site, fronting Weymouth-avenue, and the infants' school is in the southern portion. The children's entrances are in Weymouth-avenue, and the school-keeper's cottage occupies the south-west corner of the land, with its entrance in Little Ealing-lane. The infants' school has two entrances leading into broad and short corridors, from which open classrooms and lavatories. Double doors at the ends of the corridors lead into a central hall, around which are grouped eight classrooms. Teachers' rooms and storerooms are contrived over the cloakrooms. The senior school for boys and girls, which is now nearing completion, is designed on the same lines as the infants' school, and has two entrances (two for each department), with cloakrooms and lavatories adjoining. Broad corridors lead into a central hall, with sixteen classrooms grouped around it. The hall will be divided by a movable screen, which will render each department self-contained. Teachers' rooms and storerooms are arranged over the cloakrooms, with windows that command the playgrounds. Covered playsheds are provided in each playground, so planned as to form covered approaches to the outbuildings. A school-keeper's cottage is provided. The walls and ceilings are plastered, and a dado is formed of salt-glazed bricks around all the rooms, halls, and corridors. The floors are solid throughout, these in the classrooms and halls of deal, and those in the cloakrooms and corridors of granolithic paving. The warming of the school buildings is effected by a low-pressure hot-water installation. Fireplaces are also provided in the infants' school, and for the teachers' rooms. The general contractors for the Little Ealing Schools are Messrs. Joseph Dorey & Co., Ltd., of Brentford; the heating and electric light is being installed by Messrs. Strode & Co., of Regent's Park; and Messrs. Constable & Hart are laying the tar-paving of the playgrounds. Mr. Frank Griffin is foreman at the Little Ealing Schools, Mr. A. M. Southern is clerk of works for both groups of schools, and the architects are Messrs. F. H. Greenaway & J. E. Newberry, of Ealing and Westminster.

NEW SCHOOLS, HERFORD.—The Education Committee has instructed the City Surveyor to prepare plans for the conversion of St. Peter's mixed school into a girls' school for the accommodation of 300 girls. He has also been requested to submit plans for a school to accommodate 200 infants on a site adjoining the present Holmer Schools.

SCHOOLS, WHITLEY BAY.—The new schools for Whitley Bay and Monkseaton, erected by the Northumberland County Education Committee, were opened on the 8th inst. The contract price for the schools was 12,250, and the land cost 3,573. Accommodation has been provided for 1,020 children. Mr. W. H. Knowles, architect, of Newcastle, designed the buildings.

COSHAM MEMORIAL HOSPITAL, KINGSWOOD, BRISTOL.—The contract for the erection of the Cosham Memorial hospital at Kingswood has just been signed with Mr. A. J. Bevan, builder. The architect is Mr. Bligh Bond, and the hospital will occupy 4 acres at Lodge Hill, Kingswood. The hospital will be Early Georgian in style, the materials chosen

being a red pennant facing stone, with Bath stone dressings, the roofs being covered with Cumberland slates. The building consists of a main central block, containing the administrative department and running east and west, and at the western extremity, lying north and south, are the wings containing the wards. The central feature of the principal block is the main entrance, which will be of bold and massive character, the pediment of which being supported by coupled Corinthian columns. At the junction of the administrative building is the south wing. The tower, which is octagonal in form, is terminated with a cupola rising to a height of 100 ft. The tower will contain a chiming clock, with four illuminated dials. At the entrance gates will be a caretaker's house, which is designed in harmony with the building. The site will be surrounded by stone walling and ornamental railing. The internal arrangements are as follows:—The central portion of the building is devoted to administrative purposes. On entering by the main approach, there is on the ground floor a large hall, for patients, fitted with lavatory; to the right, next to this is the matron's room, and at the extreme end are wards for cases requiring isolation. To the left of the entrance are a boardroom, 21 ft. by 16 ft., and a surgeons' sitting-room, with a complete suite of surgeons' rooms, including surgery and laboratory. A corridor runs throughout the length of this section, and communicates at its extreme western end with the surgical wards and patients' department. A staircase, having a central space to take a full-sized bed lift, leads to the upper floor, which is devoted to nurses' bed and sitting rooms, matron's bedroom, etc.; whilst the attics on the second floor provide sleeping accommodation for the servants. A similar corridor to that on the ground floor runs throughout the length of the building, and gives access at its further extremities, as before, to medical wards (over the surgical wards on the ground floor, and to more isolation wards at the further end), over those already described. The main wards are each 50 ft. by 25 ft., and are lighted on both sides and at the ends. Each is planned for ten beds, and has a separate system of lavatory arrangements in the small towers at the angles. Large dayrooms for patients are planned between the wards on either floor; and nurses' kitchen, with larder, linen-room, and general store, is also provided. On the ground floor there will be an operating theatre, with anaesthetic-room and sterilising-room attached. The theatre will be paved with mosaic. Bathrooms are provided for patients and staff, and these, as well as the corridors, lavatories, etc., will be floored with Venetian mosaic. The wards will be floored with wood blocks or concrete. In the north-east corner of the site will be another block of buildings, including the laundry, stabling, boiler-house, etc.

BOULEVARD, NEW PARISH HALL, HULL.—The new parish hall, which has been erected on the Boulevard, Hull, in connexion with the St. Matthew's Church, was opened on the 4th inst. The building has been designed for three purposes:—(1) as a Sunday school; (2) for carrying on the social work of the parish; and (3) for the use of public functions. It is built of red brick, with stone dressings. There are two large halls, that on the ground floor being 30 ft. by 51 ft., and the larger one on the first floor, which has stage, dressing-rooms, etc., being 30 ft. by 64 ft. At the rear there is a drawing-room, classroom, and kitchen accommodation. The cost, exclusive of the site and furnishing, is 2,500. Mr. J. M. Dosser was the architect, and Mr. Mark Harper the principal contractor.

WORKHOUSE BUILDINGS, ANCOATS.—The new buildings of the Chorlton and Manchester Joint Workhouse in Ancoats are nearing completion. The institution includes a test-house and casual wards, the test-house being intended for able-bodied persons who have become chargeable to the poor rates, and to whom it is undesirable to grant privileges which are commonly enjoyed in workhouses where adults and children, the healthy and the infirm, are alike received. The test-house has accommodation for 220 persons. The test-house and the casual wards together cover an area of about 2½ acres. The buildings are in nine different blocks—three pavilions for the male casals, two pavilions for the female casals, two test-house pavilions for males, one test-house pavilion for females, with the administrative building and the receiving block, with officers' quarters attached. Included in the area are the labour yards and the usual 50-ft. space between the pavilions. The site is bounded by Harrison-street on the north, Stone-street on the east, Tame-street on the south, and Kennedy-street and the canal canal on the west. The entrance to the casual wards is in Tame-street, and that to the test-house in Harrison-street. The architect is Mr.

A. J. Murgatroyd, of Manchester. There are thirteen baths for the casuals, and six or eight for the inmates of the test-house. A fire-escape staircase is provided in each pavilion. The highest occupied building is four stories. There is a clock tower, which contains a water-storage tank of 1,500 gallons capacity. There is accommodation for 1,450 casuals and for 230 inmates of the test-house, and it is expected that the cost will be about 40,000. The builders are Messrs. Burgess & Galt, of Ardwick, and Mr. Robert Carlyle, of Old Trafford.

FREE LIBRARY, BOLTON COLLIERY.—A public library has just been opened at Bolton Colliery. The new building has a frontage of 60 ft. to Hedworth-lane, and a depth of 50 ft. Pelaw facing bricks have been used, with moulded pediments. Mr. A. J. Redfern, of Sunderland, is the architect, and Mr. Robert M. Storey, of West Bolton, has carried out the designs. The cost, exclusive of site, was 1,600.

HOLLYMOOR ASYLUM, NEAR BIRMINGHAM.—The Rubery Hill Asylum Annex at Hollymoor is now complete. It occupies a site about half-way between the existing asylum at Rubery and Northfield. The site contains about 120 acres, and the buildings comprise patients' blocks and administrative buildings, including a dining and recreation hall, engine and boiler house, laundry, bakehouse, and workshops, and also homes for attendants, nurses, and servants, with dining and recreation rooms. The chapel is a detached building. As it is intended that the institution shall be treated as an annex of the Rubery Hill Asylum no residence for the medical superintendent has been provided, but the buildings contain the requisite accommodation for three assistant medical officers. Lodges have been erected at the Bristol-road and Bedlam-lane entrances, and detached residences have been provided for the engineer, head attendant, and gardener, with eight semi-detached cottages for married attendants. There is an isolation hospital, including the necessary administration department. That portion of the buildings devoted to administration is of sufficient capacity to deal with 1,000 patients, but blocks have only at present been erected to accommodate 604 patients, as follows:—Sick and infirm, sixty-eight of each sex; epileptics, sixty of each sex; working patients, thirty of each sex; and chronics, 144 of each sex. The building, which was commenced about the end of March, 1900, to the plans of Messrs. Martin & Martin, of Birmingham. The builders were Messrs. J. Bowen & Sons.

BUSINESS PREMISES, BELFAST.—New premises have been erected in High-street, Belfast, for Messrs. McCullagh & Co. The building is equipped throughout with electric light, this work being fitted up by Mr. Stanley Johnston, of Belfast, the plumbing work being done by Messrs. James Lowden & Co., also of Belfast. The rear of the shop is lighted by two ceiling lights by the Pennycook Patent Glazing Company. The shop front and mahogany fittings are supplied by Mr. Alexander Mitchell from the architect's designs, and a cash delivery system is installed by the Lamson Pneumatic Tube Company. The plate-glass was supplied by Messrs. Clokey & Co., and the ornamental glass by Messrs. Campbell Brothers. The Carrara were for the front was supplied by Messrs. Doulton & Co., of London. The general contractors were Messrs. McLaughlin & Harvey, who carried out the work to the designs and under the superintendence of the architects, Messrs. Blackwood & Jury.

BANK PREMISES, MORPETH.—The new premises of Lloyd's Bank at Morpeth have been completed and opened. The block, which stands at the north-west corner of the Market-place, comprises, on the ground floor, a banking-hall, with private offices and a large strong-room, and first, second, and third floors. The building is built of Denwick stone, while the base, to a height of 3 ft., is from the quarries of Heworth Burn. The architects were Messrs. E. B. Hoare and M. Wheeler, London. Messrs. Middleton, Steppes Park, Newcastle, were the contractors for the work and fittings, and the sub-contractors were Messrs. Pentland & Co., Morpeth, for the plumbing; Mr. T. Dick, Morpeth, painting; Messrs. Burt & Potts, London, iron casements; the Gateshead Stained Glass Company, the lead glazing; and Mr. Angore, Newcastle, the marble flooring. The furnishings have been supplied by Mr. G. B. Grey, Morpeth.

MASONIC HALL, GAILEY RESTAURANT.—The Gailey Restaurant, the latest addition to those luxurious palaces which cater for the well-to-do Londoners, has just been opened. The building forms part of the same block with the Gailey Theatre, and the architect, Messrs. Ruitz & Ford, have produced a fine piece of modern street architecture. Among the attractive features of the restaurant is the Masonic Hall, a fine room on the second floor, for the decoration of which Mr. W. J. Neathy

is responsible. The hall is surrounded on three sides by a series of arches, supported by coupled Byzantine columns with shafts of light-brown marble. The arched ceiling terminates at the far end in a semi-dome, which is decorated with a fine fresco painting by Mr. Neathy. Another by the same artist occupies most of the other end of the hall. This type of mural decoration has always been found especially suited to the Byzantine style of architecture, and the result here is entirely pleasing. The colour scheme is white and gold, finely relieved by the rich brown of the marble column shafts and the ceiling, decorated with raised plaster ornaments picked out in red and blue, is rich yet restrained. The motif of the plasterwork is evidently furnished by the Masonic symbols. The electric fittings are in heavy bronze, the pendants, of the same type as the bronze oil lamps used in Eastern Mosques, harmonise well with the rest.

CHIEF FIRE STATION, MANCHESTER.—The new chief fire station at Manchester is now in course of erection. The building, which is bounded by London-road, Whitworth-street, Fairfield-street, and Minshall-street, will rise to a height of three stories, and will be ranged along the four thoroughfares named. In the centre will be an enclosed space reserved for the firemen for dwelling purposes. There will be an engine-house for seven engines, stabling for the horses, residential quarters for the officers and men, a recreation-room, and a tower, 90 ft. high, for the drying of the hose pipes. Besides its main purpose, provision will be afforded in the building for a branch police station, court-room for the city coroner, and offices for the staff of the gas-meter testing department. The police station will have a frontage to Whitworth-street and Minshall-street, and the coroner's court and gas-meter testing office will be entered from London-road and Whitworth-street, respectively. The architects are Messrs. Woodhouse, Willoughby, & Langham of Manchester. The material selected for use is tawny terracotta, faced generally with red plaster. Accrington brick. The estimated cost of the building is 85,000. Messrs. J. Gerrard & Sons, of Manchester and Swinton, are the building contractors, Messrs. Normanton & Sons being responsible for the foundations up to the ground level.

PUBLIC LIBRARY, ABERDEEN.—The new public reading-room and the extended reference-room, in the Aberdeen Public Library, has just been opened. The architects are Messrs. Brown & Watt (who were the architects for the original buildings). The style of the extension is Renaissance, in keeping with the character of the original building. Mr. James Smith has acted, under the architects, as consulting engineer in connexion with this part of the work. The work has been carried out by the following contractors:—Mason work, Messrs. R. Beattie & Son; carpenter work, Mr. George Jamieson; slater work, Mr. G. Farquhar; plaster work, Mr. James Simpson; plumber work, Mr. James Monro; painter and glazier work, Mr. W. L. Leslie; ironwork and heating and ventilating apparatus, Mr. J. A. Sangster; electric installation, Messrs. Claud Hamilton, Ltd. (Mr. Marr, consulting engineer); alterations on reference department and additional furnishings for reference and reading-rooms, Messrs. McHaffie & Brown.

CARDIFF WORKHOUSE INFIRMARY.—On the 12th inst. additions to the Workhouse Infirmary, which provide accommodation for the nurses of the staff, were opened. The additions, which have cost about 3,500, have been carried out in Newbridge stone, with Bath stone and brick facings, from designs by Mr. Edwin Seward, architect, Cardiff. The additions have included the adding of a story to the central ward. There is a large exterior verandah with staircases leading to the ground outside. There is accommodation for thirty nurses. The work has been carried out by the contractor, Mr. G. Hallett.

BOATHOUSE, HULL.—The new premises of the Kingston Rowing Club were opened on the 13th inst. The designs for the work were prepared by Mr. T. B. Atkinson, architect.

SANITARY AND ENGINEERING NEWS.

THE VICTORIA FALLS BRIDGE.—According to a report received from Sir Charles Metcalfe, the cantilever bridge over the Zambesi river at Victoria Falls will be completely riveted, painted, and finished by about the middle of next month. Work is already so far advanced that railway trucks can be taken across the bridge for the conveyance of permanent-way material for the northern part of the line. Until recently all such materials were carried across the gorge by means of the electric transporter, which was also employed for conveying the separate parts of locomotives and trucks.

MESSEY'S TRANSPORTER BRIDGE.—On the

9th inst. Mr. John J. Webster (chief engineer of the scheme), Mr. L. H. Chase (resident engineer), and Mr. F. H. Stables (secretary to the Bridge Company) were the chief passengers on what was said to be an unofficial trial trip of the car of the Widnes and Runcorn Transporter Bridge Company. The passage from Runcorn to Widnes occupied 4 min. 10 sec. This could have been easily reduced by the application of more power, but the test was not for speed but smoothness of working. Mr. Webster declared it quite satisfactory. The return journey was also accomplished without the least hitch. The car is a platform 55 ft. long by 24 ft. wide, and is capable of holding four two-horse wagons and 300 passengers. There is a shelter for passengers. The bottom of the car is 12 ft. above high-water level, and it clears the Ship Canal wall by 4 ft. 6 in. The motive power is electricity. The car is suspended by steel wire ropes from a trolley 77 ft. long, which runs upon rails on the under side of the girders of the bridge. The trolley is carried by sixteen wheels on each rail, and is propelled by two electric motors of about 35 h.p. each, the electricity being generated by a 70-h.p. gas-engine on the Widnes side. The car can be brought within its own length when travelling at full speed. The average loaded and uncrossing the river is 24 min.—*Liverpool Post.*

THE ROYAL SANITARY INSTITUTE. At an examination in sanitary science as applied to buildings and public works held in London, May 5 and 6, twenty-four candidates presented themselves, and the following nine candidates were granted certificates:—W. J. Dunk, Folkestone; H. N. Green, Commercial-road, London; A. M. Henniker, Canterbury; E. Nugent, Balham; G. H. Reynolds, Folkestone; E. Y. Saunders, Lowestoft; J. L. Soden, Wood Green; R. A. Skelton, Slough; and T. J. Welsh, Shorncliffe.

The following new members have been elected:—T. J. Welsh, Shorncliffe; M. D. (Sanitary Board Offices, Hong Kong); Major H. P. G. Elkington (Farnborough). **Members.**—J. B. Anderson, M.D. (Port Health Officer, East London, South Africa); Benjamin Ball (Borough Engineer and Surveyor, Nelson); Sir Lauder Brinton, M.D. F.R.S.; W. H. Elce, Water Engineer, Bascoy; T. Robinson (Lecturer on Hygiene, Cheshire County Council, Hoylake); W. Burn (Sutton-in-Ashfield); Colonel H. E. R. James, F.R.C.S. (Royal Army Medical Corps); R. Laurie, M.D. (Derby); K. Lutowski, M.D. (Warsaw); N. Maughan (Drainage Engineer, Bombay); H. Wood (City Engineer's Office, Liverpool); J. Cunningham (H.M. Naval Yard Extension, Hong Kong); W. J. Goode (Wellington); W. T. Hughes (Wolverhampton); E. M. Longdon (Bakewell). **Associates.**—S. Beales (Timperley); W. Bentley (Bolton); H. Bintliffe (Halifax); C. Lacey (Manchester); Miss Jane Dickson (Latham); A. E. Green (Amble); J. High (Morecambe); A. W. Hobbs (New Malden); W. Hooley (Montreal); T. B. Howarth (Levenshulme); P. C. King (Saltash); T. A. Linford (Nelson); Miss E. M. E. Moloney (Saltash); C. R. Miller (Hawthornthwaite); J. R. (Leeds); J. Tolmaer (Blackpool); F. William (Leeds).

SEWERAGE SCHEME, LIVERPOOL.—A special meeting of the Ilkerton Town Council was held on the 8th inst. for the purpose of receiving a report from Messrs. Wilcock & Raikes, engineers, Birmingham with reference to a sewage disposal scheme for the borough. Mr. Raikes gave particulars of the scheme. Having examined the district thoroughly, he had selected a piece of land at the south-east corner of the borough as the most suitable site. The local conditions rather complicated the question of sewage disposal, because they had to comply with the Local Government Board requirements, which stipulated that, no matter what system of filtration they adopted, the sewage must eventually be turned on to the land; or, in the event of land being dispensed with, the area of filters must be increased considerably. About 9 acres of land would be required for the construction of the works, and an additional 30 acres for drainage. The land in question was most unsuitable for irrigation purposes. Making the requirements to meet a population of 30,000, the cost of the scheme would be about 30,000. If they had to provide for double the area of filters instead of 15,000, would have to add a further sum of 15,000, making the total estimate of the scheme 45,000. After some discussion it was decided to adjourn the business for a fortnight.

NEW BRIDGE, LOWER KERALA, MALABAR.—To facilitate access between Lower Kerala and the Irwell, a new bridge is being built over the Irwell. The structure is of stone, 13 yds. wide, and it will cost about 10,000. The engineer is Mr. Lionel B. Wells, of Manchester.

APPOINTMENT.

LEADS.—The Council of Leeds University have appointed Mr. James Gilchrist to the chair of civil engineering, which became vacant on the death of Dr. George Wilson. Mr. Gilchrist is a graduate in science of the University of Edinburgh, with first-class honours in engineering.

FOREIGN.

PARIS.—The new curator of the Château Malmaison, M. Pallu de la Barrière, is still occupied in the reconstitution of the original state of the house when it was the residence of Napoleon. He is at present endeavouring to collect all the furniture of the Empress Josephine. But the museum (for such it will be) cannot be open to the public before the end of the year.—M. Bonnat has been appointed the position of Directeur of the Ecole des Beaux-Arts, but will not enter on his duties till October. M. Benjamin Constant, the widow of the eminent painter, has presented to the City of Paris a large painting of a scene in Morocco, "Le Jour des Mirages," which was in the Salon of 1889. The picture will be exhibited at the Ecole des Beaux-Arts.—An exhibition of the works of the artist has been opened at the Ecole des Beaux-Arts; it includes, like the recent London exhibition, paintings, sketches, and etchings. It is exciting much interest in Paris.—A committee has been formed to erect a monument to Moret, the landscape painter; it is the city of Marseilles proposes to erect a monument to Moret.

PARIS.—A large Baths establishment, formerly to be built at Contréville (Marne), to include several hotels, a hydro-therapeutic house, a casino, and a theatre. M. L. is the architect appointed for this important work, the cost of which is estimated at 4,500,000 francs.—M. Rabjean & Gilles, architects, of Cholet, have been commissioned to build for that town a new hospital and an asylum for aged men.—There is some talk of the construction of a canal from Bordeaux to Bayonne, to be continued to connect with the Adour at Dax.—The Prefecture at Angers is to be altered and enlarged, from the plans of M. Vally, architect, of Landernau.—The banks of the Seine at Havre are to be improved by a train ferry.—The cost of this operation is estimated at 8,750,000 francs.—A new railway bridge is to be built over the Garonne at Moulins, near Montauban.—The jury in competition opened at Fontainebleau for the municipal theatre has awarded the first prize to MM. Fernand Lucas and Paul Jacquot, architects, of Paris.—The death is announced of the sculptor Charles Cordier, a native pupil of Rude, who made his debut at the Salon of 1853 with some busts treated in ebony in bronze and marble. He was the author of the statues of Maréchal Gérard, of Ibrahim Pacha, and of the monument erected in Mexico in memory of Christopher Columbus.

ANGKOR VICTORIA MEMORIAL, BANGKOK.—The memorial statue to the late Queen Victoria, erected by public subscription, in front of the British Legation at Bangkok, in Siam, was unveiled on March 23. The bronze statue of the Queen, represented as seated upon a throne, crowned, bearing orb and sceptre, and arrayed in robes of State, is a reproduction of that at Winchester, sculptured by Mr. Alfred East, R.A.

SWITZERLAND.—The English church at Middleburgh has recently been enlarged from the plans prepared by Mr. Hugh J. Scott, architect, Middleburgh. The contractors were Messrs. Hull & Innes.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. W. J. Devlin, architect, has removed from 6, John Street, Adelphi, to 12, Buckingham Street, W.C.—Messrs. George Higgs (Manchester) have taken additional rooms in Shaftesbury-avenue to enlarge their present London show-rooms; their offices will now be 209 and 211, Shaftesbury-avenue.

MOSAICS.—There has lately, writes the *Times*, been a great demand for mosaic for internal and external mural decorations in Europe and America. The new system of exporting mosaics has given a great development to this branch of trade. As already related, the cartoon to be copied is exhibited from the artists on the spot, who fix the mosaic on that section of the cartoon assigned them with common mallets; when each workman has executed his work the mosaic is put together and again divided into sections, each

section being numbered and carefully packed. The key-plan forwarded to the consignee will enable him to have all the sections pressed in the cement freshly laid on the wall, and when the cement has properly hardened, the paper on which the tesserae have been pasted is removed, and a perfect mosaic is seen. I am told, adds Mr. de Zuccato, that mosaic art is now carried on in the United Kingdom, and that orders for the pieces of enamel or tesserae, to be made according to the instructions of the firms in the United Kingdom, are sent here. Purchasers of such enamels must be careful in entrusting their orders to reliable firms, and not look to cheap pieces, which, in the end, would prove dearer to them. As the enamel pieces are sold by weight, when they are composed of coarser and heavier materials a smaller number of pieces per unit results, and a consequent smaller surface can be covered. Besides, the quality of the colours used in the composition of the enamels has also a great influence on the beauty and durability of the mosaics.

AMSLER'S PLANIMETER.—The planimeter, invented by Professor Joseph Amsler, of Schaffhausen, is certainly the most convenient and most accurate instrument for measuring small areas of irregular outline. As most of our readers know, this beautiful appliance performs the apparently impossible feat of recording the area of any irregular figure by simply measuring its boundary. Surveyors are by no means unanimous with regard to the desirability of applying the planimeter to land area computation. For computing areas from small scale maps, and areas of very irregular outline, the instrument will give more accurate results than can be obtained by any other means, but, for moderately large areas, surveyors generally prefer to take off quantities either by triangles or with the computing scale. With the object of popularising the planimeter, Mr. William Codd has written a little book, published by Messrs. E. & F. N. Spon, giving simple directions for the use of the instrument, and containing the recommendation that it should be applied in connexion with his "Land Area Tables," to be obtained from the same publishers. These tables are intended to save the trouble of converting square inches of map surface to acres, roods, and perches, but they will not entirely remove all objections to the use of the instrument by land surveyors. The book concludes with a clearly-written explanation of the working principles of the planimeter.

PARISH CHURCH, NORTHFLEET, KENT.—Owing to the recent fall of part of the roof, which it is feared may be speedily succeeded by further dilapidation, the fabric is in a dangerous condition, and it is hoped that funds will be forthcoming for its repair. St. Botolph's Church, Northfleet, is one of the oldest in the county, having been given to St. Andrew's convent, Rochester, by Archbishop Anselm. It comprises features of various styles of architecture, though mainly of the later decorated period, and has a XVIIth century western tower. The nave was restored about sixty years ago, and the chancel twenty years afterwards. The chancel contains the richly-ornamented brass of Peter de Lacey, rector, who died in 1375, and rebuilt that portion of the church. There is also the alabaster tomb of Dr. Edward Browne, physician to King Charles II., and author of a work describing his travels in Hungary.

EXTENSION OF GAS WORKS, HAMILTON.—A new retort-house, containing six benches of six retorts each, is being added to the Larkhall Gas Works. They are to be built on the back to back principle, and on the regenerative system. Besides the new retort-house, a retiring-room is provided for in the plan for the accommodation of the workers, where meals can be taken away from the heat of the house. The contractors for the various works are:—Building, Messrs. R. Paton & Sons; retort benches, Messrs. James Brown & Co., Hamilton; roof and inside ironwork, Messrs. Henry Balfour & Sons, Ltd., Leven; joiner work, Messrs. William Wilson & Sons; slater work, Mr. James Rowatt; plumber work, Mr. John Dykes. The engineers for the work are Messrs. Gillespie & Son, Glasgow.

IMPORTS OF FOREIGN CEMENT INTO CONSTANTINOPLE.—An official report received at the British Foreign Office from Constantinople contains the following among other passages:—There being few other openings for local capital here, building is extremely popular with the native investor, and each year sees the erection of new blocks of flats in every quarter of the city. The annual importation of foreign cements is about 18,000 tons. Of the cement imported from France, about 80 per cent. is natural and 20 per cent. artificial. The cost of the latter is about 15 per cent. higher. A large quantity of French cement is brought here in sailing vessels from Calais.

The freight is about the same as from Marseilles, but there is a saving of 2 francs per ton Calais to Marseilles; and at Constantinople the sailing vessel can moor alongside the consignee's wharf and discharge into his store, thus saving handling, quay dues, and lighterage. The saving by delivering in sacks to be returned is another item in favour of the cheap French cement, which will always keep the bulk of the market. Nevertheless, there is always a demand for a limited quantity of the higher priced, but better quality, British article. The present quantity imported of about 1,000 tons per annum could be doubled if a regular weekly delivery could be relied upon during the period from March to December. At present the British cement is brought mostly by the steamers from London, and the arrivals are very irregular. British cement is also at a disadvantage through the general use of the name "Portland." Ignorant buyers who see the label "Portland" on casks of inferior foreign cement are sometimes under the impression that they are buying the British article. This might, perhaps, be remedied by judicious advertisement of tests applied to British as compared with other cements. The British article cannot compete on this market in point of cheapness; its one chance is its reputation for quality. It might be worth while to send out someone to examine the local conditions here, with a view to pushing sales. Terms here are, in nearly all cases, bills at three months, or discount for cash against bill of lading. Longer credit is given by the Hungarian shippers. The price of British cement works out at about 17. 4s. per ton f.o.b. London, with freight 15s. 6d., total c.i.f. Constantinople, 2l. 9s. 6d. per ton, or 52 francs.

THE MARBLES OF TUSCANY.—Reporting on the mineral wealth of the provinces of Siena and Grosseto, in Italy, the British Consul-General mentions that the marbles found there are unrivalled in Italy for their beauty and their singularly bright colours and varied tints. To take only the principal quarries there are the "old yellow" and the "Broccatello" of the well-known quarries of Montartenti; the red marbles of Gerfalco and Montieri; the veined and yellow marbles of Gallena and Maestri; the "Persichino" of Caldara; the marbles of Porzia and Castelnuovo, near Montalcino; the black marbles of Montieri and the greenish black of Vallerano; the Trequanda red; and, last but not least, the Broccatello red, lately discovered near Ravi. Many of the columns, altars, and floors of the Tuscan cathedrals, which are the admiration of the world, were made with these marbles. The Montartenti marbles enjoy a world-wide reputation, and have a ready sale both in Europe and America, prices varying from 140 lire to 220 lire per ton according to the size of the blocks. Efforts are now being made to promote a larger exportation of the other marbles, and a great development has lately taken place in the working and sale of the yellow marbles, the demand for which is daily increasing abroad. The Broccatello quarries, discovered at Ravi some years ago, are remarkable for the hardness and compactness of the marble found there, which is of a bright ruby colour. The deposits of marble have the advantage of being covered only by a thin layer of earth, and of being accessible by a good road of 300 metres, which connects them with the provincial highway at a point about 7 kilometres from the Gavarrano station. These quarries also contain both grey and red marbles of various shades. Black marble is also abundant in the district.

IMPORT OF WORKS OF ART TO NEW YORK.—It is pointed out in a recent report by Sir P. Sanderson on the trade, etc., of New York, that, in virtue of reciprocity agreements concluded with France, Germany, Italy, and Portugal, paintings in oil and water-colours, pastels, pen-and-ink drawings, and statuary can be imported at a lower rate of duty from those countries than from the United Kingdom or any country which has not concluded such an agreement. The largest importation is from France, with the United Kingdom coming next in order, and the relative proportions to the whole were, in 1904, France 43 per cent., and the United Kingdom 23 per cent.

BRITISH FIRE-PREVENTION COMMITTEE.—The Committee expect to be able to open their new testing station on June 21, and, owing to the number of tests pending and the additional testing-chambers erected, they propose conducting the tests in more rapid rotation than hitherto. The programme as fixed at present for the four first series of testing operations is as follows:—First testing day—The National Fireproofing Company's floor test; The Gilmour Door Company's door test (two doors); Messrs. Pilkington Brothers' wire glass skylight test (fifth test). Second testing day—The floor test of a concrete floor with

Messrs. Skelton's broad flange girders; Messrs. Gibson & Co.'s roller shutter door test; The National Fireproofing Company's partition test. Third testing day—Messrs. Faber's floor test; Messrs. Asbestos Brick & Tile Company's partition test (second test). Fourth testing day—The New Expanded Metal Company's floor and girder coverings test (second test).

BRITISH STANDARD STEEL FOR SHIPBUILDING.—Report No. 13, issued last week by the Engineering Standards Committee, is almost identical with the specification for steel for marine boilers, published in March last, the differences that occur arising merely out of a few small variations of practice. At the end of the specification, however, there is a clause providing that, under certain circumstances, the makers may be trusted to comply with the specified requirements and to give certificates to that effect. But should subsequent tests by the inspector give unsatisfactory results, the whole of the material involved is to be rejected. This clause will certainly have a tendency to simplify and expedite the process of manufacture, and there is no reason why it should not be added to the companion specification for steel for marine boilers.

THE DARTMOOR ARBITRATION.—Mr. A. L. Ryde has issued his award, as arbitrator, in the matter of Rendel and others v. the Secretary of State for War respecting a claim preferred against the Crown for the compulsory sale of Retford and Doe Tor farms, near Lydford, appertaining to the Hamlyn estate, and of rights in regard to about 3,000 acres of Willemsworth manor. The claimants' valuation, based upon the potential value of the property as a granite quarry and as a site for an asylum, amounted to about 23,000*l.*; that of the War Office was for an average of 2,450*l.* Mr. Ryde's award is for 5,000*l.* Mr. Henry Drew and Mr. C. W. Stephenson were arbitrators for the claimants and the War Office respectively; the principal experts engaged for the Crown were Mr. Arthur Boddy, Mr. A. S. Rendell, Mr. James Green of Messrs. Weatherall & Green, and Mr. W. H. Elwell, Consulting Surveyor to the War Office.

SOMERSET ESTATE, LINCOLNSHIRE.—In July will be offered for sale at the Mart a freehold estate of about 1,125 acres, situated in the parishes of Somersby, Ashby Puerorum, and Enderby, in the parts of Lindsey. The property to be sold comprises Somersby House, the birthplace and the home in his youth of the late Lord Tennyson, whose father was rector of the parish of Somersby. The house has been preserved practically intact as it was in the earlier years of last century, and on the estate may be identified some features of the landscape described in Tennyson's poem of "The Brook."

STRAND SCAFFOLD ACCIDENT.—On the 15th inst., whilst workmen employed by Messrs. Floyd & Hayman, builders and decorators, of Adelphi Archers, were painting the outside of the premises occupied by the *British Medical Journal*, which are situated at the juncture of Agar-street with the Strand, an unfortunate accident occurred, three painters falling some distance to the ground, and sustaining severe injuries. The injured men were removed to the Charing Cross Hospital, where their injuries were attended to. The scaffold which was in use is described as a "patent automatic safety scaffolding." The scaffold consists of a cradle working between two upright poles, which can only be raised or lowered 6 in. at a time.

QUEEN VICTORIA MEMORIAL, SHEFFIELD.—The memorial of the late Queen, which has been erected at Sheffield, was unveiled on the 11th inst. by H.R.H. Princess Henry of Battenberg. The height of the monument is 25 ft., the statue is in bronze, as are also the groups on each side of the pedestal. One of these is symbolical of Labour, the other of Maternity. On one side of the pedestal, carved in the stone, is a group with figures emblematical of Courage, Justice, Truth, and Charity; and on the other side of the pedestal is a carving of St. George and the Dragon. Mr. Alfred Turner, whose design was selected in competition, is responsible for the work.

CAPITAL AND LABOUR.

EMPLOYMENT IN THE BUILDING TRADES.—The returns received from sixty-nine employers' associations show that employment was dull generally. In the provinces it was slightly better on the whole than a month ago; in London, worse. Employment generally continued worse than a year ago. Employment with carpenters continued dull, and was worse than a year ago. The percentage of unemployed trade union carpenters and joiners was 7.5 at the end of April, as compared with 7.9 in March and 6.1 in April, 1904. With plumbers employment was slightly better than a month ago, but worse than a year ago. The

percentage of unemployed trade union plumbers was 11.2 at the end of April, compared with 11.8 at the end of March and 9.9 in April, 1904. With bricklayers employment generally was dull, but in certain districts it was slightly better than a month ago. With masons it was bad, and much the same as a month ago. With plasterers employment was bad in England, quiet in Scotland, and worse than a month ago. With slaters and tilers employment was bad in England, and fair generally in Scotland. With painters employment was fairly good, and better than a month ago. With builders' labourers it was dull.—*Labour Gazette.*

THE NEWCASTLE BUILDING TRADE DISPUTE.—Mr. Leeson has arranged a conference between the masters and the men, together with the architects, at his offices in Mosley-street, Newcastle. Each trade affected has appointed two delegates, and the employers have elected a similar number.

THE GLASGOW DISPUTES.—The patternmakers on strike in the Clyde district reported on the 15th inst. that they had begun their fifth week with quite as much determination to hold out for the advance of wages as at first. They believed that the employers were getting pretty much the lack of men, but the masters, on their part, stated that the great majority of them were keeping their shops going fairly well, and that there was no chance whatever of them giving in. The men continue to sign the strike books daily at different rooms in the district, but they are having no mass meetings. The house joiners on strike in Glasgow met on the 15th inst. as usual in the Albion Halls. They reported that 175 masters had now signed their by-laws, and that the number still on strike was less than 650. The employers stated that men were still obtainable at the reduced rates, and that after the term work was over the number of unemployed would be increased.—The Glasgow plumbers reported that a few more masters had signed their by-laws, but that otherwise the dispute remained as it was last week. There were still slightly over 300 men on strike.

EDINBURGH JOINERS' STRIKE.—At a meeting on the 15th inst. of the joiners on strike in Edinburgh, it was reported that 101 masters had now yielded to the operatives' demands.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

13,963 of 1904.—R. S. ALLAN: *Machines for Grooving or Trenching Wood.*

A machine for grooving or trenching wood, consisting in the combination with a fixed frame of a reciprocating work-carrying table adapted to have an oblique movement, springs adapted at one end directly or by extensions to a point or points of the reciprocating frame, and connected at their other end to one of a number of holes on the fixed frame for the purpose of enabling the said springs to be adjusted to pull at or about in alignment with the oblique movement of the reciprocating frame.

11,791 of 1904.—J. J. LAND: *Knobs and their Attachment to Spindles for Lock and Latch Furniture.*

One knob is permanently secured to the end of a square spindle which is threaded at its angles over a portion of its length. The other knob allows the spindle to just pass through a square hole in its neck and out through a larger round hole at the face of the knob. Fitted in this knob through the round hole is a hollow cylindrical sleeve, which is threaded inside so as to engage the thread of the spindle, hence the knob can just slide over both the spindle and the sleeve. There is a flange at the end of the sleeve which prevents the knob moving right off the sleeve. In fixing, the fast knob and spindle are put in position through door and lock. The other knob is then passed on to the projecting spindle. The sleeve is passed through the round hole of the knob and engages the thread of the spindle, hence turning the sleeve permanently secures both knobs in their proper position.

14,178 of 1904.—J. ASTON: *Preventing Shocks in Water-service Pipe.*

This invention relates to apparatus for preventing concussion in water-supply pipes when the tap or valve is suddenly closed, and consists of an air chamber or vessel which may be attached direct to a suitable extension of the valve body or to a separate tee-piece secured in any desired portion of the supply pipe. The neck or inlet opening to the air vessel is fitted with a plug in which is formed a relatively small bell-shaped passage having an area of

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

about one-twentieth of area of the supply pipe, the air vessel itself being of sufficient capacity to correspond to size of pipe and to the average pressure at which the water is conveyed therein, whereby an elastic cushion is provided to absorb the momentum existing in the column of water at the moment when its flow is arrested.

24,576 of 1904.—A. G. BAKER: *Locks.*

A cylindrical mortice lock, comprising two semi-cylinders. Corresponding securing lug thereon respectively, a spring-actuated bolt adapted to slide between the cylinders at one end thereof, a handle piece rotatable at the other end thereof, connecting means between the handle piece and the rear end of the bolt whereby rotation of the handle piece retracts the bolt, and tumbler mechanism whereby under the influence of a key the bolt is stopped from retracting.

2,556 of 1905.—W. E. MIRSCH: *Wall and Tile or Plates.*

In a wall cover, tile, or plate forming the subject of a prior patent, No. 4,905 of 1903, the next plate, when placed against a set of plates, is held fast by a hook-shaped wall nail, the set plate being held by the edge of the new plate engaging with a groove in the set plate. If in place of a hook-shaped wall nail, that is to say, of a wall nail with a head projecting only to one side, a wall nail is used with a head projecting on both sides, for instance, with a flat or round head, then both plates can be held fast by the one wall nail. In this invention, the set plate is provided on the lateral surface facing the nail with a projection forming an abutment for the wall nail, and projecting under its head.

25,475 of 1904.—W. BOURNE: *A Device for Cleaning Windows, and the like.*

This relates to a device whereby the cleaning of the exterior of windows can be performed inside of an apartment, thus avoiding the risks involved by standing or sitting outside the windows, and facilitating the cleaning of those portions of windows which would otherwise require the employment of ladders or steps. This device consists of a number of pieces of wood, or other suitable material, of an equal size, having three holes bored at equal distances in each, by means of which the pieces are fastened together so as to form a lattice-like device capable of extension or contraction. It is intended to attach to one end of this lattice-like device a clip whereby a cloth or pad can be attached. In employing the device, the lower end of the window is partly opened, the device is passed through to the outside of the window, the hands grasping the end of the device furthest from the cleaning cloth or pad, and by alternately extending and contracting the device, the pad or cloth is caused to pass over the surface of the glass of the window which is thus cleaned.

26,894 of 1904.—J. BARDSLEY: *Door Checks and Closers.*

A door check and closer, comprising an exterior casing, a spindle therein for connection with the door, and a yoke, rod, cylinder, piston, and spring, in one connected mechanism extending horizontally within the casing and at right angles to said spindle, said cylinder being adapted to move open the exterior surface of said piston, which is normally stationary, combined with means for moving said yoke, rod, and cylinder in one direction from said spindle, and means connected with said piston for adjusting the same and said connected mechanism laterally on the arc of a circle whose centre is the said spindle.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return original communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples sent to or left at the office, unless he has specially asked for them, and they are accompanied by a return address.

Letters or communications received from persons (names) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any communication to a contributor for publication, given or to execute or lend a drawing for publication, is subject to the approval of the Editor, who retains the right to accept or reject, by the Editor, who retains the right to accept or reject, if it is unsatisfactory. The return by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literature and artistic matters should be addressed to THE EDITOR, and matters relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

SOME RECENT SALES OF PROPERTY:

Table with 2 columns: Property Description and Price. Includes entries like 'ESTATE EXCHANGE REPORT', 'By LEE & FARR (at Slough)', 'By BRAD & CAPPE (at Notting Hill)', etc.

Table with 2 columns: Property Description and Price. Includes entries like 'By ALFRED RICHARDS', 'Old Southgate, Blagden's-la.', 'By DOUGLAS YOUNG & Co.', 'King's Cross—25 and 27, Winchester-st. (a.)', etc.

Table with 2 columns: Property Description and Price. Includes entries like 'By MAPLE & Co.', 'Worthing, Sussex—Farncombe-rd.', 'By T. D. PRACY', 'St. John's Wood—46, Abbey-rd.', etc.

Table with 2 columns: Property Description and Price. Includes entries like 'By REYNOLDS & RASON', 'Piccadilly—53, "The Albany" (chambers), f.', 'By TYLER, GREENWOOD, & CRIER', 'Hoxton—30, Hemsforth-st.', etc.

PUBLISHER'S NOTICES.

Nat. Tel. 612, Gerrard. Telegrams, "The Builder, London."

THE INDEX, WITH TITLE-PAGE for VOLUME LXXVIII (July to December, 1904) was given as a supplement with the issue for January 14 last.

CHARGES FOR ADVERTISEMENTS.

COMPETITIONS, CONTRACTS, AND OTHER COGNATE PROCEEDINGS OF PUBLIC COMPANIES, SALES BY TENDER, LEGAL ANNOUNCEMENTS, etc., etc.

Six lines or under 8s. 6d.
Each additional line 1s. 6d.

ALTERATIONS IN STANDING ADVERTISEMENTS OR ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

PERSONS advertising in "THE BUILDER" may have Copies addressed to the Office, Catherine Street, Covent Garden, W.C., free of charge. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

MEETINGS.

- SATURDAY, MAY 20.
Edinburgh Architectural Association.—Visit to Dundee under the auspices of the Dundee Institute of Architecture.
- MONDAY, MAY 22.
Society of Arts (Contor Lectures).—Mr. H. W. Ravenshaw on "The Uses of Electricity in Mines." 11.8 a.m.
- TUESDAY, MAY 23.
Royal Institution.—The Rev. H. G. Woods, D.D., on "Valerius." 1.5 p.m.
Society of Arts (Colonial Section).—Sir Charles H. T. Metcalfe, Bart., M.Inst.C.E., on "The Cape to Cairo Railway." 4.30 p.m.
- WEDNESDAY, MAY 24.
Society of Arts.—Twenty-Second Ordinary Meeting. Mr. Killingsworth Hedges, M.Inst.C.E., on "Modern Lightning Conductors." 8 p.m.

THURSDAY, MAY 25.
Society of Antiquaries.—8.30 p.m.
Royal Institution.—Professor J. A. Fleming, M.A., on
"Electromagnetic Waves." 1. 5 p.m.
FRIDAY, MAY 26.
Royal Institution.—Professor Julius W. Brühl on
"The Development of Spectro-Chemistry." 9 p.m.

PRICES CURRENT OF MATERIALS.

* Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.	
Hard Stocks.....	£ s. d.
1 10 0 per 1000 alongside, in river.	
Rough Stocks and	
Grizzles.....	1 6 6
Facing Stocks.....	2 2 0
Shippers.....	2 2 0
Flettons.....	1 7 0
Red Wire Cuts.....	1 14 0
Best Parnham Red	12 12 0
Best Red Pressed	
Buabon Facing	5 0 0
Best Blue Pressed	
Staffordshire.....	4 2 6
Do. Bullnose.....	4 7 6
Best Stourbridge	
Fire Bricks.....	4 0 0
Glazed Bricks.....	
Best White and	
Ivory Glazed	
Stretchers.....	12 0 0
Headers.....	11 0 0
Quoins, Bullnose,	
and Flats.....	16 0 0
Double Stretchers	19 0 0
Double Headers.....	16 0 0
One Side and	
Ends.....	19 0 0
Two Sides and	
one End.....	20 0 0
Splays, Cham-	
ferred, Squints	20 0 0
Best Dipped Salt	
Glazed Stretch-	
ers, and Header	12 0 0
Quoins, Bullnose,	
and Flats.....	14 0 0
Double Stretchers	15 0 0
Double Headers.....	14 0 0
One Side and	
Ends.....	15 0 0
Two Sides and	
one End.....	15 0 0
Splays, Cham-	
ferred, Squints	14 0 0
Second Quality	
White and	
Dipped Salt	
Glazed.....	2 0 0
Thames and Pit Sand.....	s. d.
7 0 per yard, delivered.	
Thames Ballast.....	9 0
Best Portland Cement.....	27 0 per ton.
Best Ground Blue Lias Lime	20 0
NOTE.—The cement or lime is exclusive of the ordinary	
charge for sacks.	
Grey Stone Lime.....	12s. 6d. per yard, delivered.
Stourbridge Fireclay in sacks	27s. 6d. per ton at rly. dep.

STONE.	
Barn Stone—delivered on road wag-	s. d.
gons, Paddington Depot.....	1 6s per ft. cube.
Do. do. delivered on road wag-	
gons, Nine Elms Depot.....	1 8s
Portland Stone (30 ft. average)	
Brown Whitted, delivered on road	
wagons, Paddington depot, Nine	
Elms depot, or Pimlico Wharf.....	2 1
White Banded, delivered on road	
wagons, Paddington depot, Nine	
Elms depot, or Pimlico Wharf.....	2 2s
Ancaster in blocks.....	s. d.
1 11 per ft. cube, del. rly. dep.	
Beer.....	1 6
Greenshill.....	1 10
Darley Dale in blocks.....	2 4
Red Corsehill.....	2 5
Closworth-Freestone.....	2 0
Red Mansfield.....	2 4
York Stone—Robin Hood Quality.	
Scrapped random blocks	2 10
6 in. sawn two sides	
landings to sizes	
(under 40 ft. super.)	2 3 per ft. super.
6 in. rubbed two sides	
ditto, ditto.....	2 6
8 in. sawn two sides	
slabs (random sizes)	0 11s
2 in. to 2 1/2 in. sawn one	
side slabs (random	
sizes).....	0 7s
1 1/2 in. to 2 in. ditto	0 6
HARD YORK—	
Scrapped random blocks	3 0 per ft. cube,
6 in. sawn two sides	
landings to sizes	
(under 40 ft. super.)	2 8 per ft. super.
6 in. rubbed two sides	
ditto.....	3 0
3 in. sawn two sides	
(slabs random sizes)	1 2
2 in. self-faced random	
slabs.....	0 5
Hopton Wood (Hard Bed) in blocks	s. d.
2 0 per ft. cube, del. rly. dep.	
6 in. sawn both	
sides landings	2 7 per ft. super.
8 in. sawn both	
sides random	
slabs.....	1 0
2 in. do.....	0 2s

SLATES.	
in. in.	£ s. d.
20 x 10 best blue Bangor	13 2 6 per 1000 at rly. dep.
20 x 12.....	13 17 6
20 x 10 first quality.....	13 17 6
20 x 12.....	13 15 0
16 x 8.....	7 5 0
20 x 10 best blue Port.	12 12 6
16 x 8.....	6 12 6
20 x 10 best Eureka un-	
fading green.....	15 17 6
18 x 10.....	13 5 0
16 x 8.....	10 5 0
20 x 10 permanent green	11 19 6
18 x 10.....	8 12 6
16 x 8.....	6 12 6

TILES.	
Best plain red roofing tiles.....	£ s. d.
6 0 per 1000 at rly. dep.	
Hip and Valley tiles.....	3 7 per doz.
Best Broseley tiles.....	50 0 per 1000
Do. Ornamental tiles.....	52 6
Hip and Valley tiles.....	4 0 per doz.
Best Buabon red, brown, or	
brindled do. (Edwards) 57	6 per 1000
Do. Ornamental do.....	60 0
Hip tiles.....	4 0 per doz.
Valley tiles.....	3 0
Best Red or Mottled Stafford-	
shire do. (Peakes).....	51 9 per 1000
Do. Ornamental do.....	54 6
Hip tiles.....	4 1 per doz.
Valley tiles.....	3 8
Best "Rosemary" brand	
plain tiles.....	48 0 per 1000
Best Ornamental tiles.....	50 0
Hip tiles.....	4 0 per doz.
Valley tiles.....	3 8
Best "Hartell" brand	
plain tiles, sand faced.....	50 0 per 1000
Do. pressed.....	47 8
Do. Ornamental do.....	50 0
Hip tiles.....	4 0 per doz.
Valley tiles.....	3 6

WOOD.	
Deals: best 8 in. by 11 in. and 4 in.	At per standard.
by 9 in. and 11 in.....	£ s. d.
13 10 0	15 0 0
Deals: best 5 by 6.....	15 0 0
Battens: best 2 1/2 in. by 7 in. and	
8 in., and 3 in. by 7 in. and 8 in.	11 0 0
Battens: best 2 1/2 by 6 and 3 by 6.....	10 0 0
Deals: seconds.....	1 0 Oless than best.
Battens: seconds.....	0 10 0
2 in. by 4 in. and 3 in. by 6 in.....	9 0 0
2 in. by 4 in. and 3 in. by 5 in.....	8 10 0
Foreign Sawn Boards—	
1 in. and 3 in. by 7 in.....	8 10 0 more than
3 in.....	1 0 0 battens.
At per load of 50 ft.	
Fir timber: best middling Danzig	4 10 0
or Menzel (average specification)	4 0 0
Seconds.....	4 0 0
Small timber (8 in. to 10 in.).....	3 12 6
Small timber (6 in. to 8 in.).....	3 10 0
Swedish balks.....	3 10 0
Pitch-pine timber (30 ft. average)	3 5 0

JOISTERS' WOOD.	
White Sea: first yellow deals,	At per standard.
3 in. by 11 in.....	24 0 0
3 in. by 9 in.....	23 0 0
Battens, 2 1/2 in. and 3 in. by 7 in.	16 10 0
Second yellow deals, 3 in. by	
11 in.....	18 10 0
Battens, 2 1/2 in. and 3 in. by 7 in.	17 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0
Battens, 2 1/2 in. and 3 in. by 7 in.	11 0 0
Petersburg: first yellow deals,	
3 in. by 11 in.....	21 0 0
Do. 3 in. by 9 in.....	18 0 0
Battens.....	15 10 0
Second yellow deals, 3 in. by 11 in.	16 0 0
Do. 3 in. by 9 in.....	14 10 0
Battens.....	11 0 0
White Sea and Petersburg—	
First white deals, 3 in. by 11 in.	14 10 0
3 in. by 9 in.....	13 10 0
Battens.....	11 0 0
Second white deals, 3 in. by 11 in.	13 10 0
Do. 3 in. by 9 in.....	12 10 0
Battens.....	10 0 0
Pitch-pine: deals.....	16 10 0
Under 2 in. thick extra.....	0 10 0
Yellow Pine—First, regular sizes	44 0 0 upwards.
Oddments.....	32 0 0
Seconds, regular sizes.....	33 0 0
Yellow Pine oddments.....	28 0 0
Kauri Pine—Planks, per ft. cube	0 3 6
Danzig and Stettin Oak Logs—	
Large, per ft. cube.....	0 3 0
Small.....	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0
Dry Wainscot Oak, per ft. sup. as	
inch.....	0 0 8
3 in. do. do.....	0 0 7
Dry Mahogany—Honduras, Ta-	
casco, per ft. super. as inch.....	0 0 9
Selected, Figur., per ft. sup. as	
inch.....	0 1 6
Dry Walnut, American, per ft. sup.	
as inch.....	0 10 0
Teak, per load.....	17 0 0
American Whitewood Planks,	
per ft. cube.....	0 4 0
Prepared Flooring, etc.....	Per square.
1 in. by 7 in. yellow, planed and	
shot.....	0 13 6
matched.....	0 14 0

WOOD (continued).	
Prepared Flooring, etc. (continued)—	Per square.
1 1/2 in. by 7 in. yellow, planed and	£ s. d.
matched.....	0 16 0
1 in. by 7 in. white, planed and	0 14 0
shot.....	0 12 0
1 in. by 7 in. white, planed and	0 13 6
matched.....	0 13 6
1 1/2 in. by 7 in. yellow, matched	0 11 0
and beaded or V-jointed brds.	0 11 0
1 in. by 7 in. do. do.....	0 14 0
3 in. by 7 in. white do. do.....	0 10 0
1 in. by 7 in. do. do.....	0 12 9
6 in. at 6d. to 8d. per square less than 7 in.	0 13 0

JOISTS, GIRDERS, &c.	
In London, or delivered	Per ton.
Railway Vans, per ton.....	£ s. d.
6 0 0	6 12 0
Roller Steel Joists, ordinary	
sections.....	7 10 0
Compound Girders, ordinary	
sections.....	8 2 6
Steel Compound Stanchions and	
Angles, Tees and Channels, ordi-	
nary sections.....	7 10 0
Pitch Iron Columns and Stan-	
chions including ordinary pat-	
terns.....	6 12 6

METALS.	
Per ton, in London.	£ s. d.
Iron—	
Common Bars.....	7 0 0
Staffordshire Crown Bars, good	
merchant quality.....	7 10 0
Staffordshire "Marked Bars"	
Mild Steel Bars.....	8 5 0
Hoop Iron, basis price.....	8 15 0
Galvanizing.....	16 10 0
* "As" upwards, according to size and gauge.	
Sheet Iron, Black—	
Ordinary sizes to 20 g.....	9 0 0
24 g.....	10 0 0
26 g.....	11 15 0
Sheet Iron, Galvanized, flat, ordinary quality—	
Ordinary sizes 6 ft. by 2 ft. to	
3 ft. to 20 g.....	12 10 0
Ordinary sizes to 22 g. and 24 g.	
26 g.....	13 0 0
Sheet "Iron" Galvanized, flat,	
26 g.....	14 0 0
Ordinary sizes to 20 g.....	15 10 0
22 g. and 24 g.....	16 0 0
26 g.....	17 10 0
Galvanized Corrugated Sheet—	
Ordinary sizes 6 ft. to 8 ft. 20 g.	
22 g. and 24 g.....	13 10 0
26 g.....	14 10 0
Best Soft Steel Sheets, 6 ft. by 2 ft.	
to 3 ft. by 20 g. and thicker 11	
Best Soft Steel Sheets, 22 g. & 24 g.	
26 g.....	13 10 0
Cut nails, 3 in. to 6 in.....	9 0 0
(Under 5 in., usual trade extra.)	10 0 0

LEAD, &c.	
Per ton, in London.	£ s. d.
Lead—Sheet, English, 3 lb. and up 15	
lb. in coils.....	15 17 6
Soil pipe.....	15 7 6
Comp. pipe.....	15 7 6
Zinc—Sheet.....	30 15 0
Vielle Montagne.....	30 15 0
Silesia.....	30 15 0
Copper—Sheet.....	0 10 0
Strong Sheet.....	0 10 0
Thin.....	0 10 0
Copper nails.....	0 10 0
Strong Sheet.....	0 0 4
Thin.....	0 0 4
Thin.....	0 0 4
Thin—English Ingots.....	0 0 4
Scrap—Plumbers'.....	0 0 8
Timber.....	0 0 8
Blowpipe.....	0 0 8

ENGLISH SHEET GLASS IN CRATES.	
15 oz. thirds.....	£ s. d.
21 oz. thirds.....	3s. 6d.
26 oz. thirds.....	3s. 6d.
32 oz. thirds.....	3s. 6d.
Flat Sheet, 15 oz.....	3s. 6d.
21 oz.....	3s. 6d.
32 oz.....	3s. 6d.
4 Hartley's Rolled Plate.....	3s. 6d.
5.....	3s. 6d.

OILS, &c.	
Per gallon.	£ s. d.
New Lined Oil in pipes.....	0 1 11
" " in barrels.....	0 1 11
" " in drums.....	0 1 11
Boiled.....	0 1 11
" " in barrels.....	0 1 11
" " in drums.....	0 1 11
Turpentine, in barrels.....	0 1 11
Gunpowder Ground English White Lead	
in drums.....	0 1 11
Red Lead, Dry.....	0 1 11
Best Lined Oil Putty.....	0 1 11
Stockholm Tar.....	0 1 11
VARNISHES, &c.	
Per gallon.	£ s. d.
Fine Pale Oak Varnish.....	0 8 0
Pale Copal Oak.....	0 12 0
Superfine Pale Blue Oak.....	0 12 0
Fine Extra Hard Church Oak.....	0 12 0
Superfine Hard-drying Oak, for sale of	
Churches.....	0 12 0
Fine Elastic Carriage.....	0 12 0
Superfine Pale Elastic Carriage.....	0 12 0
Fine Pale Maple.....	0 12 0
Finest Pale French Oil.....	0 12 0
Extra Pale French Oil.....	0 12 0
Eggshell Flattening Varnish.....	0 12 0

CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Readers to be Delivered
Street Works (eleven contracts)	Manchester Paving, etc., Committee	Paving, etc. Dept. (Surveyor's Office), Town Hall, Manchester.	May 20
Dwelling-house, Dintlehorn, N.B.	Committee of Visitors	Fiddoch Cottage, Ardilly, N.B.	May 22
Painting, County Asylum, Freetrich.	Greenock Corporation	At the Asylum	do.
Stores	Glyncoerwg U.D.C.	W. Ewing, Engineer and Manager, Inchgreen Gasworks, Greenock	do.
Building an Exhaustor House	do.	Council Offices, Cymmer (Mr. W. J. Jones)	do.
Purifiers, Boiler, Exhaustor, and Engine and Pumps	do.	do.	do.
Resetting a Bed of Fire Retorts	Carlisle U.D.C.	do.	do.
Water Main Extension, Warwick Bldg. to Holme Eden	Epping U.D.C.	F. Barker, Waterworks Manager, 7, Victoria-place, Carlisle	do.
300 tons of Gravel	Wharfedale Guardians	G. J. Cress, Clerk, Epping	do.
Infirmity Buildings, Tewall, Odsey	Glasgow Corporation	W. B. H. Marten, Architect, 21, Church Bank, Bradford	do.
Electric Light Installation, Parkhead District Library	Perth Town Council	J. R. Rhind, 87, Hope-street, Glasgow	do.
Causewaying Glasgow-road	Tantobie Co-operative Society	R. McKillop, Burgh Surveyor, 12, Tay-street, Perth	do.
Roadmaking, Tantobie	Bingley Industrial Co-operative, Soc.	Architect's Dept., Co-op. Wholesale Soc. W. Bradford-st., North	do.
Stables, Sick-room, etc., for Seven Horses	Warrington Sanitary Works Com.	W. Rhodes Nunn, Architect, Market-street, Bingley	do.
Centrifugal Pump at Longford Depot	Eccles Corporation	Manager, Longford Depot, Warrington	do.
Heating of Council (Temporary) School	Messrs. Salfons, Ltd.	E. Parkes, Town Clerk, Eccles	do.
Stores on site of Malthouse, South Mall, Cork	Keynasham Guardians	S. F. Hynes, F.R.I.B., 11, South Mall, Cork	do.
Removal, Stone-arched Shed Roof, Mount-st., Halifax	Salford Corporation	A. G. Dalziel, Architect, 15, Commercial-street, Halifax	May 23
Cover shed w. Iron Roof & Glazing, Mount-st., Halifax	Bombay, etc., Central India Ry. Co.	do.	do.
Additions to Infirmary at Keynasham Workhouse	The Trustees	H. M. Bennett, Archt., Liverpool-chambers, 38, Corn-street, Bristol	do.
Villa Residence, West-lane, Baldon	Tynemouth Corporation	J. Harper Baker, Archt., Calverley-chambers, Victoria-square, Leeds	do.
Showering, Paving, etc., of Streets in Fendleton	Kingstown U.D.C. (Ireland)	Borough Engineer's Office, Town Hall, Salford	do.
Stores	Manchester Education Committee	T. W. Wood, Gloucester House, Bishopsgate-street Without, E.C.	do.
Primitive Methodist Schoolroom, Cellarhead	Manchester Guardians	W. B. Parsons, Weston Colwyn	do.
Gasholder Tank (38 ft. by 22 ft. 6 in. deep)	Unionsist Club Co., Ltd.	W. J. Hall, Manager and Secretary	do.
Roadworks, Morpeth-terrace, etc., Ferry Main	Wortley R.D.C.	J. F. Smilie, Borough Surveyor, Tynemouth	do.
Painting and Colouring Interior of Library	Hythe Corporation	The Librarian	May 24
Furnish. Residential Sch. for Crippled Child, Swinton	East Indian Railway Co.	W. H. Talbot, Town Clerk, Manchester	do.
Small Additions to Bathroom at Swinton Schools	Winsford U.D.C.	J. F. Walsh & G. Nicholas, Museum-chambers, Harrison Rd., Halifax	do.
Detached House, near Stump Cross, Shildon	Durham R.D.C.	W. Clement Williams, Architect, 29, Southgate, Halifax	do.
Boundary Walling, Railings, etc., Halifax Workhouse	Cardiff Corporation	W. Dodds Lees, Architect, 8, Dumfries-place, Cardiff	do.
School & Alters, etc., Penygarn Chapel, Pontypool	Gordon-Richmond Estates	T. Taylor Scott, Architect, 43, Lowther-street, Carlisle	do.
Caretaker's Cottage at Sewage Wks. Pitley, Tacknaley	do.	G. E. Beaumont, Sanitary Surveyor, Greenock, near Sheriffield	do.
Sinking a 14-in. Borehole at Blue House, Saltwood	do.	C. Jones, Borough Surveyor, Bank-buildings, Hythe, Kent	do.
Metals	do.	C. W. Young, Secretary, Nicholas-lane, London, E.C.	do.
656 lineal yds. of Pipe Sewers, Coxhoe	do.	J. Wilkinson, Surveyor, Winsford, Cheshire	do.
Fifty Loads of Hardwood for Street Paving	do.	G. Gregson, Surveyor, 83, Saddler-street, Durham	do.
7,000 yds. of Cast-Iron Gas-mains	do.	W. Harpur, Borough Engineer, Cardiff	do.
Dwelling-house, Culchome, Auchanodun	do.	W. Barber, 2, Trinity-road, Smeeth-on-the-Sea	do.
Stable and Men's Room, Corsmould	do.	Estate Office, Drumin, Glenlivet	do.
Stable Wing & Men's Room, Auchanodun, Glenlivet	do.	do.	do.
Dwelling-house, Eskmerloch	do.	do.	do.
Stables, Achdreggie	do.	do.	do.
Cattle Sheds, Blairindry	do.	do.	do.
Byre, Lynbig	do.	do.	do.
Dwelling-house, Blairnamarrow, Strathaven	do.	do.	do.
Man's Room, etc., Haddoch, Cairnhead	Birmingham Public Works Comtee.	J. Price, City Engineer, Council House, Birmingham	May 25
Private Drainage	Ashted U.D.C.	J. Wittet, Architect, Elgin	do.
Road Metal	do.	C. M. Davies, 112, High-street, Merthyr	do.
Alterations, etc., at Western Pleasance-st. Standing	do.	do.	do.
Alterations, etc., at Wards of Alves Steading	do.	do.	do.
Shop, Cacharris, Dowals	Kent Education Committee	G. E. Bond, Architect, 334, High-street, Rochester	do.
Rebuilding Ivor Arms, Cacharris	Lambeth Borough Council	Borough Engineer, 246, Kennington-road, S.E.	May 29
New Council School, Cuxton	R.D.C.	Rev. F. Lucas, 26, College-road, Elgon	do.
Spitch Pine and Poling Boards	Salford Electricity Committee	W. J. Cress, Surveyor, Headington	do.
Primitive Methodist Chapel and School, Masham	Guildford R.D.C.	Borough Electrical Engineer, Frederick-road, Pandiford	do.
Hospital and Administration Block at Headington	Managing Committee	C. O. Doig, Architect, Elgin	do.
Painting at Frederick-road, Headington	Metropolitan Asylums Board	J. Anstee, Surveyor, Council Offices, Guildford	do.
House at Craggaunre Distillery, Ballindaloch	Elginshire C.C.	Secretary & Surveyor, 22, Ship-street, Brighton	do.
Road Materials	Anstruther Wester Town Council	Office of the Board, Embankment, E.C.	May 27
Alters, etc., Oddfellows Hall, Queen-st., Brighton	Visiting Committee	G. Gordon & Co., Engineers, Inverness	do.
Cleaning and Painting Levees and Asylum	do.	J. & T. W. Currie, Architects, Elgin, N.B.	do.
Finchhorn and Kinloss Waterworks	do.	A. Gillies, Keeper, Finner, Rannoch Station, N.B.	do.
1,600 yds. of Paving with Whinstone Setts	do.	J. T. Cheetham, Clerk and Steward	do.
Embankment for Trout Loch on Finner, Rannoch	do.	do.	do.
Painting Buildings at County Asylum, Lancaster	do.	do.	do.
Extension of Verandah, County Asylum, Lancaster	Harrogate Corporation	E. W. Dixon, Engineer, 14, Albert-street, Harrogate	do.
Iron Balcony, County Asylum, Lancaster	Highland Railway Co.	A. Maitland & Sons, Architects, Tain, N.B.	do.
Columns, Girders, & C.I. Framing for Covered Way	Runcorn Guardians	W. Roberts, Engineer-in-Chief, Inverness	do.
Pipe Line, Section No. 2 (Masham Scheme)	Glamorgan Education Committee	G. F. Ashton, 71, High-street, Runcorn	do.
Residence at Advie, Strathpey	Rt. Hon. Viscount Falkland	T. M. Franklin, Clerk, Westgate-street, Cardiff	do.
Six Workmen's Dwellings at Aviemore Junction	Elham R.D.C.	G. Gow, Fregothman Office, Truro	do.
Painting Outside of Workhouse at Aviemore Junction	N.E. & Midland Railway Co.	A. J. Cornelius, Architect, Truro	do.
Heating Apparatus, Toneyfall Boys' School	Bury Guardians	B. Loneragan, 11, Cheriton-place, Folkestone	do.
Cattle-shed, Tresawson, Merther, Cornwall	Darrah Building Club	J. Wittet, Architect, Elgin	May 28
Additions to Perran House, Perranporth	Rugely U.D.C.	W. J. Caldwell, Engineer, Tain	do.
110 yds. of 9-in. Stoneware Pipe Sewer, Saltwood	Friley U.D.C.	A. Hopkinson, Agt.-street, Bury, Lancs.	do.
Bakery, Froehabert	Sunderland Corporation	Morgan & Elford, Architects, 1, Jeffrey-street, Mountain Ash	do.
Signal Cabin at Ferrybridge Station	Second Sixty Co-operative Society	W. E. Rogers, Surveyor, Anson-street, Rugely	do.
Two Steel Lancashire Boilers	Hendon U.D.C.	J. W. Moncar, Borough Surveyor, Town Hall, Sunderland	do.
140 Dwellings-houses, etc., Mountain Ash	Camberwell Borough Council	C. T. Ruthven, Architect, Bank-chambers, Heathfield-st., Strass	do.
Granite and Granite Chippings	do.	Engineer & Surveyor to the Council, Council Offices, Hendon, N.W.	do.
Private Street Works, Camberley	do.	Borough Engineer, Town Hall, Camberwell, S.E.	May 30
Sanitary Arrangements, etc., Undergrd. Conveniences	do.	J. Bell, Surveyor, Westley, E.S.O.	do.
Five Pairs of Semi-Detached Houses, Sketty	do.	do.	do.
200 tons Pea Gravel or Granite Chippings	Hadleigh U.D.C.	C. J. Grimwade, Urban District Council Offices, Hadleigh, Suffolk	do.
Making-up and Paving New Street	South Indian Railway Co.	E. J. Wolfenden, Borough Engineer, Town Hall, Botic	do.
Concrete Foot-paths at Parkstone	do.	R. W. Notman, 55, Gracechurch-street, London, E.C.	do.
Foot-paths, Mistley	do.	do.	do.
Broken Guernsey or Alderney Granite	Tees Conservancy Commissioners	J. H. Anns, Secretary, Middlesbrough	do.
Brick Sewer	Burslem Corporation	Ashton Bremner, Borough Electrical Engineer, Burslem	do.
General Stores	do.	do.	do.
Leopoldine Stores	Cramlington U.D.C.	W. J. Coulson, Surveyor, Cramlington	do.
65 tons of Fencing	do.	do.	do.
Machinery	Houghton-Je-Spring Guardians	Master of the Workhouse	do.
Electric Wiring Town Hall, Markets, Bais, etc.	do.	do.	do.
House Service Pumps and Meters	West Hartlepool Corporation	N. F. Dennis, Borough Engineer, West Hartlepool	do.
Rolling for Road Repairs	Dunstable, etc., Hospital Committee	G. Simcox, Architect, Town Hall, Dunstable	do.
Carting of Whinstone	do.	do.	do.
Supply of Whinstone and Slag	do.	do.	do.
Boundary Walls at Union Workhouse	do.	do.	do.
Free School Court	do.	do.	do.
Street Works	do.	do.	do.
Infectious Diseases Hospital for Twenty, Kenworthy	do.	do.	do.

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered
Bromley Town Council	Borough Engineer, Municipal Offices, Bromley	May 30	
Leyton U.D.C.	W. Dawson, Surveyor, Town Hall, Leyton	do.	
Bromley Town Council	Borough Engineer, Municipal Offices, Bromley, Kent	do.	
Wood Green U.D.C.	C. J. Gwynon, Architect, Town Hall, Wood Green, N.	do.	
Great Western Railway Co.	Engineer, Newport Station	do.	
New Sarum Town Council	Engineer, Paddington Station	do.	
Bury Corporation	City Surveyor, Endless-street, Salisbury	do.	
North-Eastern Railway Co.	Borough Engineer, Bury, Lancashire	May 21	
Torquay Corporation	W. Bell, Architect, Central Station, Newcastle-on-Tyne	do.	
Hove Corporation	E. C. Chapman, Water Engineer, Town Hall-chambers, Torquay	do.	
do.	H. H. Scott, Borough Surveyor, Town Hall, Hove	do.	
do.	do.	do.	
Basingsstoke Corporation	T. R. Philips, Borough Surveyor, Town Hall, Basingstoke	do.	
Brierley Hill U.D.C.	Surveyor's Office, Town Hall, Brierley Hill, Staffs.	do.	
Hadham R.D.C.	A. G. Gwynon, Clerk to Hadham R.D.C., Bishop's Stortford	June 1	
Teddington Burial Board	M. Hamsworth, Surveyor, Elmfield House, Teddington	do.	
Lindsey C.C. Education Committee	Forster & Gamble, Architects, Bank-street-chambers, Lincoln	June 2	
Teddington U.D.C.	M. Hamsworth, Surveyor, Elmfield House, Teddington	June 3	
Friendly and Trade Societies	T. Kershaw, Architect, L. & Y. Bank-chambers, Halifax	do.	
Rotherham Town Council	J. S. Hepburn, Town Clerk, Rotherham, N.B.	do.	
Clyde Navigation Trustees	Superintendent of Stores, 16, Robertson-street, Glasgow	do.	
do.	T. Cann Hughes, Town Clerk, Lancaster	do.	
Prestwich U.D.C.	Surveyor's Office, Chester Bank, Prestwich	June 5	
Glasgow Corporation	City Engineer, City-chambers, 64, Cochran-street, Glasgow	do.	
Mountain Ash U.D.C.	W. G. Thomas, Architect, Public Offices, Mountain Ash	do.	
Hornsey Town Council	E. J. Lovegrove, Municipal Offices, Southwood-lane, Highgate	do.	
Loughdon U.D.C.	District Surveyor to Council	do.	
Piomegate E.D.C.	T. W. Read, Clerk, Wickham Market Workhouse, Suffolk	do.	
Surrey Education Committee	J. Jarvis & Richards, 38, Victoria-street, S.W.	do.	
Hipperholme U.D.C.	C. Wharton Thompson, Surveyor, Council Offices, Hipperholme	June 6	
Middlesex C.C.	H. T. Wakelam, County Engr., Middlesex Guildhall, Westminster	do.	
Horsham Guardians	C. H. Burston, Architect, 6, West-street, Horsham	do.	
Reading Local Education Authority	G. W. Webb, Architect, Reading	do.	
Ilkington Borough Council	Borough Engineer, Town Hall, Upper-street, N.	do.	
do.	do.	do.	
Bristol Dock Committee	W. W. Aquile, Engineer, Cumberland Basin, Bristol	June 7	
Borough of Hove	Born. Engr. & Sur. Municipal Offices, 93, Southwood-lane, Highgate	do.	
Chelsea Borough Council	Town Hall, King's-road, Chelsea, S.W.	do.	
Wolverhampton Education Com.	T. H. Fleeming, Architect, 10, Queen-square, Wolverhampton	do.	
Hendon U.D.C.	Clerk to the Guardians, Union Offices, Edgware	do.	
Pearkryher Navigation Colliery Co.	Secretary, Pearkryher, N.S.O., Glam.	June 8	
Bootle Corporation	Borough Engineer's Office, Town Hall, Bootle	do.	
Acton U.D.C.	W. G. Hunt, Architect, 17A, Vicerage-gate, W.	June 12	
Croydon Union	Hatchard Smith, Archt., 41, Moorgate Station-buildings, E.C.	do.	
Colchester Corporation	C. E. Bland, Town Hall, Colchester	June 13	
Totnes R.D.C.	B. Hamsford, Engineer, 42, George-street, Plymouth	June 14	
Watford U.D.C.	H. M. Turner, 14, High-street, Watford	do.	
Metropolitan Asylums Board	Office of the Board, Embankment, E.C.	do.	
do.	do.	do.	
Commissioners of H.M. Works, etc.	H.M. Office of Works, Storey's-gate, S.W.	do.	
Lochreilly Town Council	Buchanan & Bennett, C.E., 12, Hill-street, Edinburgh	June 22	
Trustees of the Unitarian Church	A. Lloyd Thomas, Eng. & Arch., Church-st-chambers, Pontyprrid	June 23	
Mersy Railway Co.	G. H. Langham, Sec., Worcester House, Walbrook, London, E.C.	No date.	
Sheffield Brick Co.	W. G. Buck, Architect, 4, East-parade, Sheffield	do.	
Mr. J. C. Hall	Macintosh & Newman, Birkbeck-bank-chs., Eltham Holborn W.C.	do.	
do.	T. Brownlow Thompson, Architect, 15, Parliament-street, Hull	do.	
do.	E. Simpson, Architect, 12, Cunliffe-terrace, Manningham, Bradford	do.	
do.	R. B. Pratt, Architect, Elgin	do.	
do.	Tait & Goodchild, Architects, 18, Ironmonger-lane, E.C.	do.	
do.	Garlick & Flint, Terrace-road, Buxton	do.	

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
Borough of Osselt	Not stated	May 22	
Bradford Corporation	Not stated	May 25	
Metropolitan Borough of Woolwich	£2 10s. per week	May 29	
do.	£2 10s. per week	June 2	

Those marked with an (*) are advertised in this number. Competitions, —. Contracts, iv. vl. vill. x. Public Appointments, xvi.

TENDERS.—Continued from page 555.

NOTICE.—For construction of tramways in Archway-road, Highgate, for roadwork, paving works, etc., London County Council:—

	Tramway Construction.	Paving Works of Street Widening.	Total.
	£ s. d.	£ s. d.	£ s. d.
Gray, G. & Matthews	5,074 14 0	1,082 1 7	6,156 15 7
Gray & Co., Ltd.	5,087 15 8	1,104 18 6	6,192 14 2
Griffiths & Co., Ltd.	4,954 13 8	1,034 5 10	5,988 19 6
Green & Co., Ltd.	4,920 2 4	1,035 8 7	5,955 10 11
James	4,807 13 2	1,036 11 9	5,843 5 11
Kim, & Co., Ltd., London*	4,687 16 9	1,010 8 5	5,698 4 2

NOTICE.—For making-up Rostrevor-mews-approach, Bolton Borough Council. Mr. F. Wood, Bolton & Town Hall, Fulham, S.W.:—

Harvey	£189 0 0
F. Fowles	£189 0 0
Harvey	£189 0 0
Harvey	£189 0 0

NOTICE.—For erecting new boundary walls for the Guardians. Mr. Jabez de la Roche, King Edward-street, Macclesfield:—

£330

NORTH SUNDERLAND.—For laying cast-iron mains, fixing valves and fittings, and building pits (North Sunderland water supply), for the Trustees of Lord Crew's Charity, Messrs. Anson & Shenton, engineers, 28, Victoria-street, Westminster, S.W.:—

Hardy & Atkin-son	£1,570	0 0	Braithwaite & Co.	£875	0 0
E. & A. Storey	1,445	12 1	R. Carse & Son	870	0 0
W. Foster	1,417	7 6	Brebner & Co.	850	0 0
J. Davidson	1,330	0 0	W. Carr	783	8 7
E. Mackay & Son	1,285	0 0	J. & G. Green	785	0 0
G. J. Short	1,133	11 0	R. Hudson & Sons	740	0 0
W. Iant	1,163	1 0	Elliot Bros.	695	0 0
Henderson	1,130	0 0	Preston & Chathill	696	0 0
Armstrong	957	0 0			
Tait & Goodchild					
McLaren & Co.	697	0 0			
Co.					

PWLLHIEL (Wales)—For altering Din's G.M. Chapel, Llanestyn, erecting new schoolroom, house, and shop, etc. Mr. R. L. Jones, County Architect, Carnarvon:—

J. T. Jones	£1,720 0 0	G. Jones	
S. J. L. Vincent	1,630 0 0	P. R. Jones	
J. Griffith	1,630 0 0	M. R. Jones	
Jones, Roberts, & Jones	1,616 18	P. R. Jones	
		W. Pritchard & M. Roberts	1,140 0

* Recommended for acceptance. [Architect's estimate, £2,000.]

RADCLIFFE (Lancs.).—For additions and alterations to St. Thomas's Schools, for the Trustees and Managers Messrs. J. Sellers, Son, & Orrell, architects and surveyors, Union-chambers, Bury. Quantities by the architects:—

Brickwork: T. Lawrenson & Son, Radcliffe, Lancs.	£548 0 0
Stonemasons: T. Butterworth & Son, Radcliffe, Lancs.	91 10 0
Carpenters and Joiners: Collier & Smith, Radcliffe, Lancs.	480 19 0
Slater: J. W. Aston, Whitbush, Lancs.	85 0 0
Painters: J. Lomax & Co., Radcliffe, Lancs.	55 1 10
Plumber: A. T. Walker, Radcliffe, Lancs.	133 5 0
Ironfounders: J. Wolstenholme & Son, Radcliffe, Lancs.	40 19 5
Heating: Saunders & Taylor, Ltd., Manchester.	188 0 0

SCUNTHORPE.—For the erection and construction of new buildings and other works of levelling, paving, the supply and erection of new cattle pens and fittings for the new market buildings and premises, for the Urban District Council. Mr. A. M. Cobban, Engineer, Home-street, Scunthorpe:—

H. Ashby...	£2,345 0 0	C. Hollingsworth	£2,183 13 7
L. J. Thompson	2,145 0 0	W. Pallister, Scunthorpe	2,134 0 0

SEAHOUSE.—For constructing a reservoir to hold 4,000 gallons, near Seahouses (North Sunderland water supply), for the Trustees of Lord Crawe's Charity. Messrs. Anson & Shepton, engineers, 23, Victoria-street, Westminster, S.W.:—

McLaren & Co.	£900 0 0	R. Case & Son	£328 7 6
Hobbs & Co.	575 0 0	Brathwaite & Co.	328 0 0
W. Lant	487 11 6	R. Hudson & Sons	310 0 0
Henderson & Armstrong	410 0 0	W. Foster	304 4 5
J. Carrick	385 0 0	J. & G. Green	298 0 0
W. & A. Storey	381 16 1	P. & A. Storey	381 16 1
J. T. Short	380 9 4	Chapman & Son	380 9 4
J. Davidson	370 0 0	Hardy & Atkinson	360 0 0

SHEFFIELD.—For the construction of parts of Winco-bank-avenue and Foxglove-road. Mr. C. F. E. Wike, M.Inst.C.E., City Engineer, Sheffield:—

J. Haddfield & Sons, Sheffield * .. £1,088 3 6

SHERINGHAM (Norfolk).—For new elementary schools, for the Norfolk Education Committee. Messrs. Olley & Haward, architects, Great Yarmouth:—

C. T. Baker, Ltd.	£7,874 0 0	C. A. Sadler	£6,247 0 0
Gilling & Smith	5,783 0 0	J. W. Neale	6,260 0 0
G. Riches	6,734 0 0	H. Bullen	6,149 0 0
R. Chapman	6,590 0 0	A. E. Chapman	6,145 0 0
Farter & Wright	6,549 0 0	P. Gill	6,083 0 0
W. Porter	6,490 0 0	Co. Building	6,008 0 0
J. Youngs & Son	6,348 0 0	W. J. Hannant	5,997 0 0
G. A. Lines	6,323 11 0	T. H. Blyth	5,965 0 0
G. E. Hawes	6,290 0 0	Blyth & Sons	5,965 0 0
Spencer, Santo, & Co.	6,260 0 0	Sheringham *	5,960 10
H. C. Greengrass	6,250 0 0		

[Architects' estimate, £8,400.]

SOYLAND.—For 400 yds. of kerbing and 550 yds. of flags, Rochdale-road, Ripponden Wood, for the Urban District Council. Mr. J. Wadsworth, Surveyor, Ripponden:—

Cranshaw Bros., Woodville, Ripponden *	s. d.	Kerb laying	0 6	per yd. lineal.
G. Cheetham	5 1	Flags sq.	4 4	per super. yd.
W. Appleyard	1 0	Kerb laying	0 9	per yd. lineal.
Riley, Sons, & Hartley	1 1	Flags sq.	4 11	per super. yd.
Yorkshire Building & Monumental Stone Co., Ltd., S. Marshall & Sons	6 10	Kerb laying	0 7	per yd. lineal.
	6 4	Flags & kerb	6 10	" "
W. Crowther	£151 19 7			
S. Smith	188 15 0			
J. & R. A. Cranshaw	137 0 0			

Whole Tender.

SUTTON (Surrey).—For repairs to roads at the Downs School, Banstead-road, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief:—

S. Kavanagh	£746 0 0	J. G. Freeman	£875 0 0
Co.	690 0 0	Ennes Bros.	638 0 0
A. C. Soan	690 0 0	Trebb & Co.	426 8 6
E. Hes. Jun.	646 0 0	Hillside road, Grounds & New-ton	628 0 0
		Chatham *	426 8 6

TAYLORSTON.—For erecting a smallpox hospital at Lower Taylorston, near Stirling, for the Stirling Combination Hospital Committee. Mr. A. H. Goudie, Burgh Surveyor, Stirling. Quantities by Burgh Surveyor:—

Builders: R. Anderson & Sons, Stirling	£214 10 7
Joiner: J. McAllister, Stirling	223 14 8
Plumbers: J. & J. Duff, Stirling	119 17 6
Slaters: Milne & Co., Stirling	60 14 6
Plasterer: R. Foster, Stirling	70 16 6

TOTTENHAM.—For renovations, decorations, and repairs, to fourteen houses, Vernon-road, Tottenham, Middlesex. Mr. O. L. Morgan, architect, 49, Cannon-street, London, E.C.:—

West Bros. & Pettitt, Walthamstow	£252
-----------------------------------	------

WALMER.—For sewerage works in Mongeham Bottom-road, Cross-road, and Waterworks-road, for the Urban District Council. Mr. H. W. Barker, Surveyor, Walmer. Quantities by Surveyor:—

W. H. Combs	£275 12 0	C. Castle & Co.	£542 15 8
A. E. Turner	690 7 0	G. Brownrigg	632 0 0
A. E. Good	565 0 0	J. G. Porter, Melvedere	457 0 0
A. G. Ouseley	563 12 6	Kent	457 0 0

WELWYN (Herts.).—For 58 tons of 9-in. cast-iron pipes, for the Rural District Council. Messrs. H. Walker & Sons, engineers, Albion-chambers, King-street, Nottingham:—

Holwell Iron Co. Ltd., Ashfordby, near Melton Mowbray, Leicestershire	£284 6 1
---	----------

WITHAM (Essex).—For external and internal painting at Bridge School, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief:—

J. F. Penn	£390 0 0	T. Cole, 125, Offord-road, Barnsbury	£153 0 0
C. Coteching	231 5 0	E. G. Rogers	230 0 0
E. Proctor	225 0 0	Brotman & Bern-Lilley & Sons	227 0 0

WOOLWICH.—For erecting a large heater room at the Brook Fever Hospital, Shooter's Hill, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief:—

E. Proctor & Son	£2,380 0 0	Friday & Ling	£1,050 0 0
Russell Bros.	1,067 0 0	T. Cole, 125-7, Offord-road	1,044 18
Thomas & Edge	1,040 0 0	Barnsbury, N.*	1,044 18
E. Wall	1,703 0 0		

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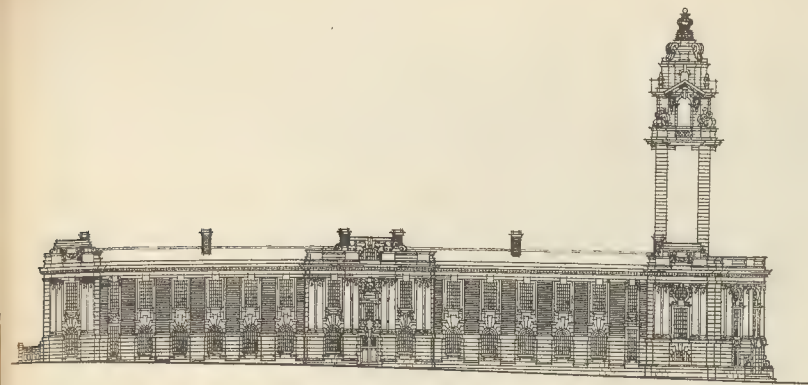
BRISTOL: Ashton Gate Works, Coronation Road



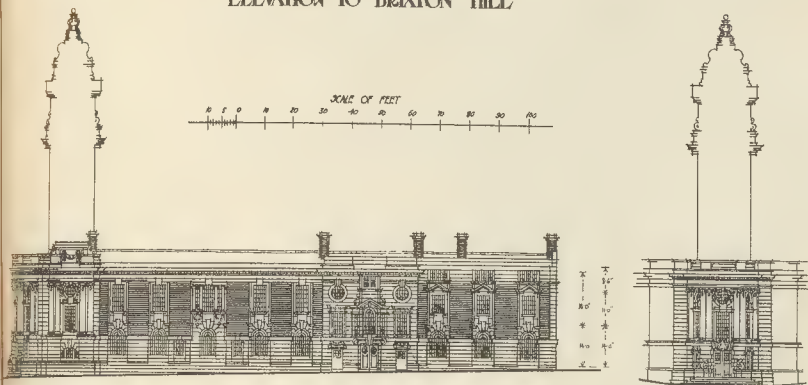
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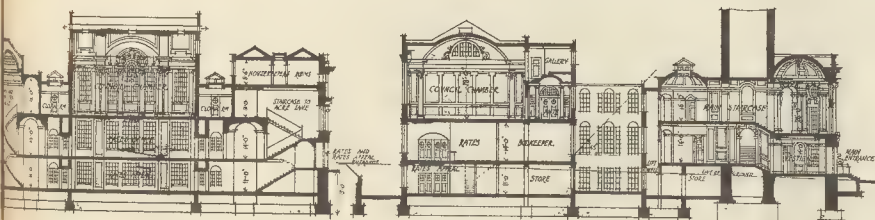


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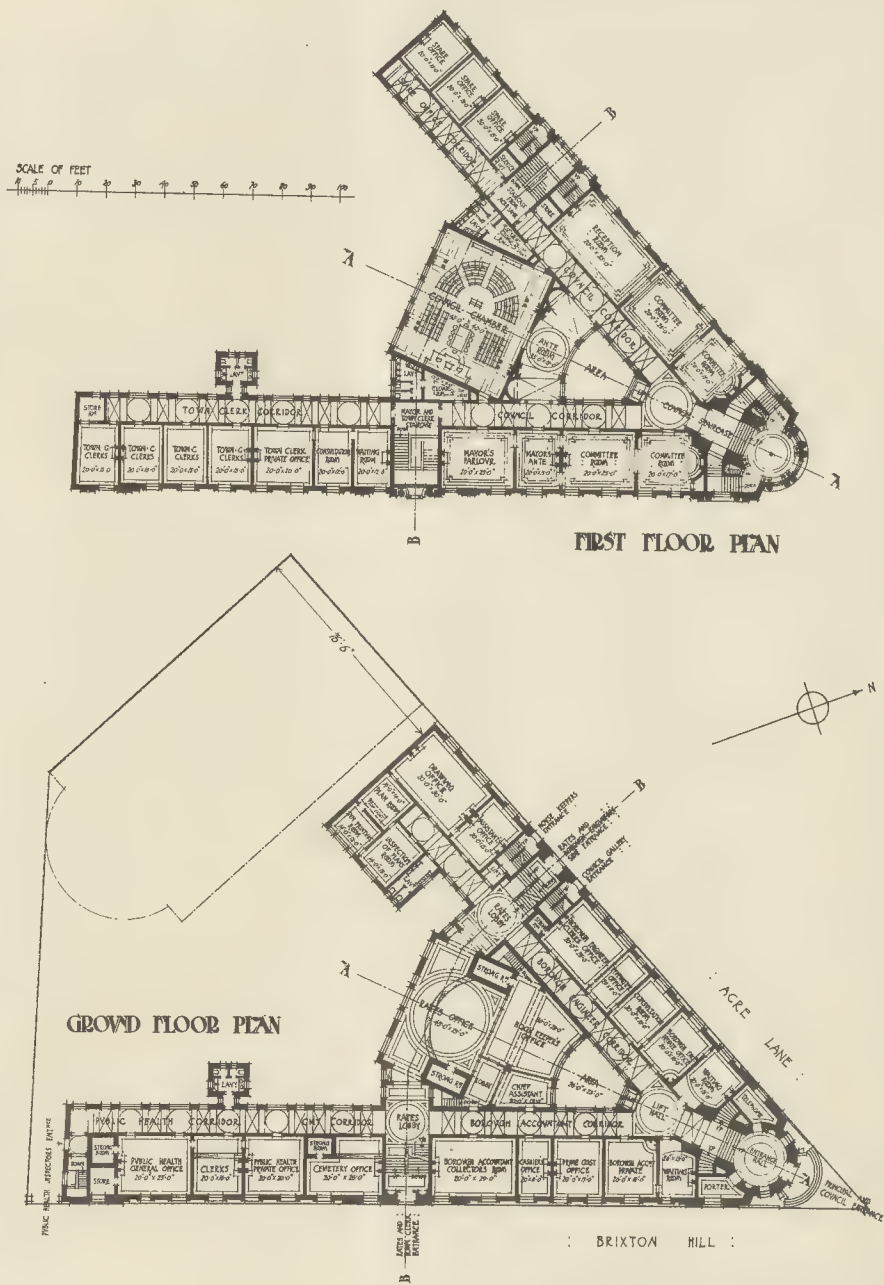
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SECTION B-B

SECTION A-A



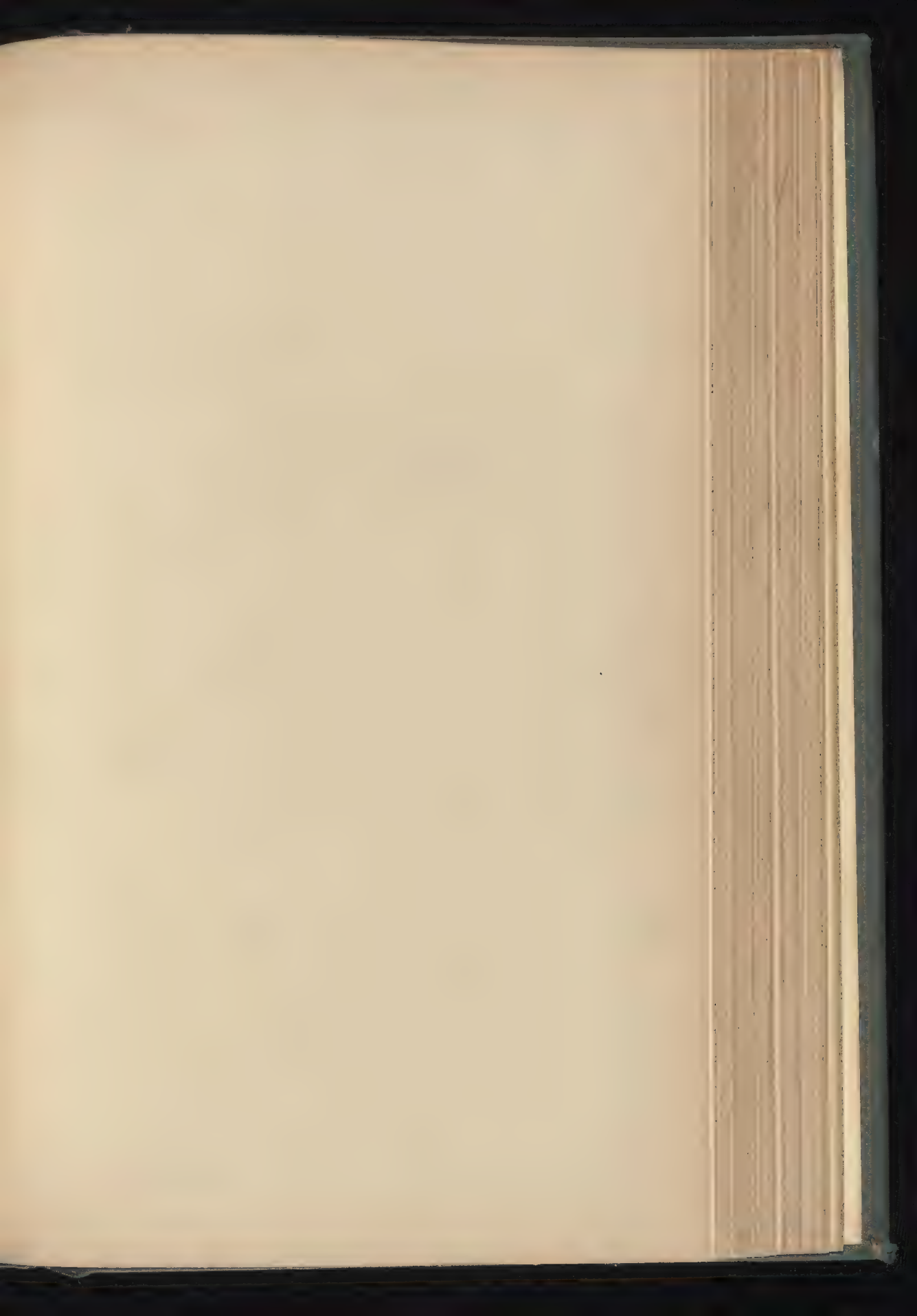
FIRST FLOOR PLAN

GROUND FLOOR PLAN

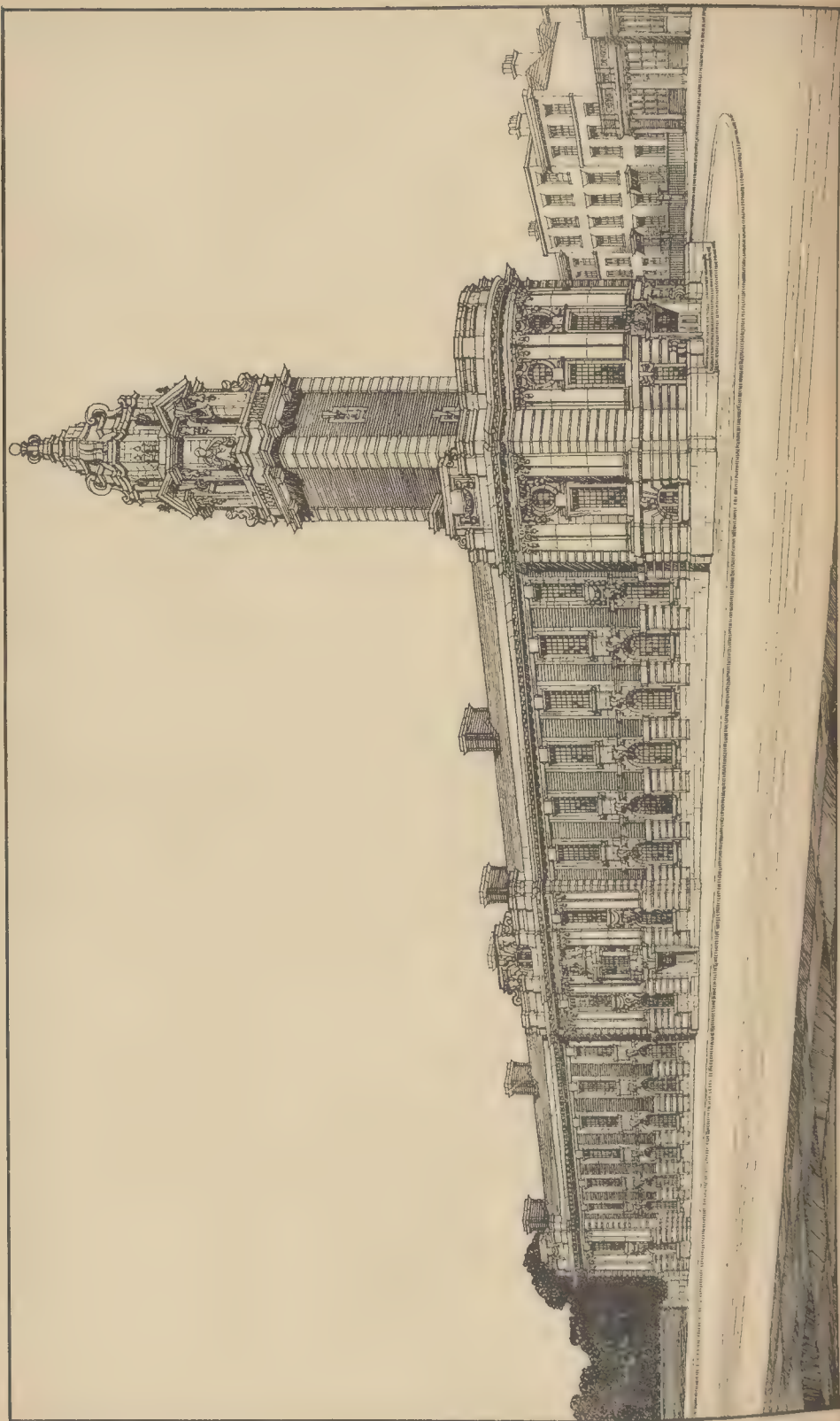
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THE BUILDER, MAY 20, 1905.





LAMBETH
New
MUNICIPAL BUILDINGS
View on Brixton Hill

LAMBETH MUNICIPAL BUILDINGS COMPETITION · SECOND PREMIAED DESIGN.
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PERSPECTIVE VIEW.

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The Builder.

VOL. LXXXVIII.—No. 3251.

MAY 27, 1906.

ILLUSTRATIONS.

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1. View of Administration Block.
2. General Plan.
New Public Offices, Seacombe, Cheshire.....Messrs. Briggs & Wolstenholme and A. Thornely, Architects.
Accepted Design for Clock Tower, St. George's-circus.....Mr. Jan F. Groll, Architect.

Illustrations in Text.

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Fig. 3. Courtyard of Bishop's Palace, Lucera	Page 566	Perspective View	Page 574
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Lightning Conductors.

It can heartily congratulate the Lightning Research Committee on their valuable Report, which has just been published in the twelfth volume of the *Journal of the Institute of Architects* (p. 405). It will be read with equal interest by architects and electricians, for although it contains nothing that is absolutely novel, yet the conclusions arrived at after laborious and accurate investigation will be of the greatest assistance to those who endeavour to design systems of lightning conductors on scientific principles. The setting of the report is very clear, and practically no technical terms being used, the arrangement of the matter is admirable. We have only noted one misprint, “3” for “5,” near the top of p. 415.

It is now about sixteen years since Sir Oliver Lodge read his classical paper on Lightning Conductors to the Institution of Electrical Engineers. His conclusions were violently attacked at the time by the older school of electricians, and they are now nearly all adopted by those who are capable of forming an independent opinion on their merits.

An extraordinary, however, to note that no engineering pocket-books are still publishing many of the erroneous recommendations of the Lightning Rod Committee held in 1882. If this report

merely has the effect of stopping the printing of nonsense about the areas protected by lightning conductors and the superiority of copper to iron for conveying a lightning discharge, it will perform a most useful function.

In the preface to the Report Sir Oliver Lodge lays emphasis on the importance of distinguishing between two kinds of lightning flashes. When the difference of pressure between a cloud and a prominent object on the earth's surface is gradually established we get the “A” flash. If the prominent object be a tower, with a pointed lightning conductor, then the flash will almost certainly strike the conductor, as the brush discharge from the point rapidly ionises the air in the neighbourhood, and makes the path to the point the path of least resistance. In the second kind of discharge we get the “B” flash. In this case we have the impulsive rush that takes place when a discharge ensues between two clouds and one of them instantaneously overflows to the earth. It is exceedingly difficult to protect buildings from the effects of this latter kind of discharge. Sir Oliver Lodge compares it to an avalanche. Unlike a trickling stream of water, it will not take what is apparently the path of least resistance; but, crashing through all manner of obstacles, it often moves in quite unexpected directions. Many of the ninety-eight cases of buildings struck by lightning, the reports of which are summarised by the Committee, illustrate the difficulty of protecting buildings from “B” flashes. For instance, Mr. Hedges reports a case where a private dwelling-house

was struck twice, although every chimney-stack was fitted with a lightning rod and the earth connexion was good. The first flash struck and displaced the conductor, and also did damage to the chimney and to slates. The second destroyed a chimney, damaged the roof, and struck a statue not provided with a conductor.

A novel point in connexion with lightning rods is illustrated by several of the cases reported. Whether the discharge be oscillatory or not, metallic objects in the neighbourhood of the lightning conductors will have high electromotive forces induced in them. It is advisable, therefore, to connect the points of those metallic objects (generally the ends), where dangerously high pressures are developed, to the earth. The accident to St. Paul's Church at Bedford gives a good illustration of this inductive effect. The conductor consisted of a copper cable extending from the seat of the weathercock to the lead flat at the bottom of the spire. The discharge passed down the conductor to the lead flat, proceeding to the earth through the rain-water pipes, and setting up in its passage violent inductive effects in neighbouring metallic objects. As these were not connected with the earth the discharges proceeding from them displaced heavy beams inside the building and split the supporting corbels.

A useful feature of this report is the publishing in parallel columns of the Lightning Rod Rules issued in 1882 and the comments made on them by the Lightning Research Committee. It is

now definitely stated that it is not necessary to go to the expense of electroplating points. It seems to us, however, since the expense is a trifling matter and the plating prevents corrosion, that in some towns it would be distinctly desirable. We are glad to note that the Committee lend no support to the practice of fixing lightning rods to buildings by means of glass or other insulators. A few years ago this practice was advocated by several leading scientists.

It is recommended that in most cases the lightning rod when vertical should be supported at some distance away from the building. We suppose that a method similar to that which Mr. Hedges uses to support the conductors at Westminster Abbey meets with the approval of the Committee. We thought that this was done to avoid "side flash," but the reasons adduced are that it prevents dirt accumulating, and that it obviates the necessity of running the conductor round projecting masonry or brickwork.

Manufacturers should note that tall chimney shafts are not efficiently protected against a "B" flash if only a single conductor be used, as a hot column of smoke conducts as well as, or even better than, a rod. A circular band in the form of a coronal, with four or more conductors, should surround the top of the chimney, and it is better to use two lightning rods to connect this with the earth.

It is interesting to note that no cases of damage to modern steel frame structures have come under the notice of the Committee. They point out that in many cases the steel columns stand on stone foundations, and they recommend that they should be effectively earthed at the time of construction.

With the eight practical suggestions with which the Committee conclude their Report we are in entire agreement. Perhaps a word of warning might have been added to the fifth suggestion, which states that "all roof metals, such as finials, ridging, rain-water and ventilating pipes, metal cowl, lead flashings, gutters, etc., should be connected to the horizontal conductors." It is easy to imagine cases where, if this advice is slavishly adhered to, metal balconies, etc., may prove to be death-traps in sultry weather. The advice is also given to connect turret clocks with the conductor. One effect of this would be to make the clock winders nervous on sultry days.

In an appendix to this Report are given details of the methods advised and adopted for the safety of buildings in France, Holland, Germany, and Austria-Hungary. Dr. Van Gulik's report to the Dutch Academy of Science is particularly interesting reading. Owing to the difficulty of fixing high terminal rods he advises that only short rods be used. He states that for lightning conductors iron is better than copper, and when well galvanised it will resist atmospheric influences for a long time, especially if protected by a coat of paint occasionally. He also advises that the thickness of the conductors should be reduced. It is particularly gratifying to note that practically all the suggestions made and quoted in this report have a scientific basis, and it will well repay careful study.

Until our knowledge of the distribution and laws of atmospheric electricity is extended it seems probable that this report will be the standard authority on the protection of buildings from lightning.

WORKMEN'S COMPENSATION.

AT the commencement of the present law sittings the Court of Appeal have again been occupied with Workmen's Compensation, some thirty-two cases having been set down for appeal in the list, and on the decisions now given the main point of difficulty for determination has been—what is now to be included in the word "accident"? In our recent Note on *Brintons, Ltd., v. Turvey* (the anthrax case in the House of Lords) we pointed out that that judgment, with the reservations it contained, would now raise complicated points for decision as to what connexion must exist between the disease and the employment, and the time and nature of its origin, for injury by disease to be deemed an "accident"; and we referred to the evidence given before the Departmental Committee especially with reference to blood poisoning. The Court of Appeal have now, in the case of *Steel v. Cammell, Laird, & Co.*, had to consider a case of blood poisoning. The applicant was employed by the respondents, who were shipbuilders, as a caulker, caulking watertight shoes with red and white lead. He had been working for the respondents for two years, when one day he was suddenly seized with cramp and afterwards became paralysed. The medical evidence was that the lead poisoning might have been caused either by inhalation into the lungs or by eating without having removed the lead from the hands; that it was a result which might be expected from the man's work, but that only a small number of such cases occurred amongst the very large number of persons working with red and white lead. The Court of Appeal, whilst commenting on the difficulty in view of the decided cases of determining what was intended by the word "accident," held that it must be something the origin of which could be ascribed to a particular date, basing this reasoning upon section 2 sub-sect. 2 of the Act, which requires notice of an injury to be given and the date at which it was sustained.

The Court followed the same line in two other cases, *Marshall v. East Holywell Coal Co.* and *Gorley v. Owners of Barkworth Colliery*, which were cases where miners were incapacitated by complaints known as "beat hand" and "beat knee," due to inflammation of the soft tissues consequent on the nature of their employment, constant jar of the hand or pressure from kneeling. The difficulty of coming to a conclusion in these cases is now very apparent. The rule laid down by the Court of Appeal is an easy-working rule, but how far is it consistent with the finding of the House of Lords in the anthrax case? How can it be said that a time could be fixed for the origin of that complaint, any more than in lead poisoning? The only time which seems to have been regarded in that case was the time when the man was

taken ill. There is one great distinction between the miners' cases and the anthrax case, which enables it to be seen why it may be deemed "accidental" whilst the others are not. In the miners' case beat hand or beat knee are complaints usual to the nature of the employment and which must be anticipated; anthrax is not a usual consequence, is specially guarded against by appliances such as fans, and infection may therefore be said to be accidental. The lead poisoning case is more difficult to distinguish, since in that case the evidence was that, although such a disease was possible consequence, it was by no means a necessary one, since there were but few cases amongst the large number of men employed in working with red and white lead.

We can only repeat what we said in our recent Note on *Brintons, Ltd., v. Turvey* that the question urgently calls for legislation, and should certainly be dealt with in the Bill now before Parliament. The Departmental Committee advised the disease consequent upon occupation should be dealt with separately under a scheme of sick insurance, and instance the very difficulty now experienced, viz. the difficulty of determining its inception, and it is now for the Legislature to put an end to much litigation by declaring one and for all, and in clear terms, its intention on the subject.

Another point in connexion with the word "accident" had to be considered by the Court of Appeal in the case of *Wilkes v. Dowell & Co.*, where a man engaged in unloading a ship standing on a plank over the hold was seized with an epileptic fit and fell into the hold, sustaining injuries. The Court reversing the finding of the County Court judge, held this to be an accident under the Act, and to have arisen out of an injury in the course of his employment; finding on the authority of the decision in *Fenton v. Thorley*, in the House of Lords—commented upon by us August 2, 1903—that the efficient cause was the fall and the dangerous position he stood was necessary to his employment.

One of the difficult questions decided under the Act is—when does employment commence so as to bring a workman under the operation of the statute? There have been many decisions dealing with this question, and they are by no means easy to reconcile with another. The latest case is that of *Sharp v. Johnson & Co.* (May 1905). The applicant was a painter employed by builders up to the roof of some schools for the County Council at Catford. The hours of work commenced at 6.30 a.m., and the men had to show a check at the office near the entrance to the works on arrival, and take the check out again when they left. The applicant had been engaged on this work for some five weeks, and he and many other workmen had been in the habit of coming to the works by a train which started for them there about 6.10. The man in question arrived at the works on August 30 as usual, and went to the office to deposit his check, and would then have proceeded to the mess room, a room provided by the employer where he would have remained until the whistle blew for work. On this morning he found on his way to the office

or hole, had been opened up between him and the office. The watchman met him, and offered to deposit his check for him, and as he was in the act of handing his check to the watchman a quarrel slipped, and he fell into the hole, sustaining injuries. The Court of Appeal (reversing the Court below) held him to have sustained these injuries in the course of his employment. The Court laid it down that the test was whether the man had or had not commenced work, but that a reasonable person must be allowed to enable the man to reach his actual place of work upon the premises, and that if in the interval he was engaged on anything to the benefit of his employer as well as himself, he was acting in the course of his employment. They observed that in this case it was necessary that the man should get to the works twenty minutes before the time of commencing actual work, and the employers had provided a place for refreshment.

Only one other case at present requires notice, *Back v. Dick Kerr & Co.*, which turned upon the area of employment on or in or about an "engineering works." The man who was injured was employed by contractors who were engaged in taking up the old tramway rails and laying new rails for the tramways in Exeter. Part of the work related to the rails running from St. Andrew's station and down Queen-street. New rails were brought to the London and South-Western Railway Station, the end of which abuts on Queen-street, and some of the rails were, by an arrangement with the railway company, stored in this yard, and the man was engaged in loading the rails and stacking them in the yard when he met with an accident. It was admitted that the tramway was within the definition of "engineering works," and the only question was whether the applicant was engaged on or in or about it. The County Court judge held that he was, but the Court of Appeal reversed this finding. The actual work under the contract which was being carried on at the time of the accident was 700 yards away from the yard, but the Court does not seem to have based its decision upon that fact alone, but upon the fact that the station yard formed a part of the physical area of the engineering work, as the stacking of the rails was formed no part of the work which the contractors had undertaken to execute. The limitation of area, as we pointed out in our Note on the case of *Watkinson v. White* (November 19, 1904), was not satisfactory, since at its limit it always seems to be the cause of hardship to someone, and it is exceedingly difficult of determination, as it has been held that a quarter of a mile may be within the limit whilst two and a half miles has been held outside it. The decision in this case may suggest, however, a better test in some cases—viz., is the man engaged directly on the undertaking, or only on an incidental process ancillary to it?

ART EXCHANGE.—On May 30 will be unveiled a panel painted by Mr. W. F. Yeames, at the gallery in the ambulatory of the Royal Exchange. The panel depicts the "Foundation of St. Paul's School by Dean Colet," and is painted by Mr. J. Horsley Palmer.

NOTES.

The Institute
Council Election.

We have printed more than one letter protesting against the endeavour to make the election of members of Council turn only on the question of their adherence to a special policy. But there is another point in connexion with the subject which had better not be forgotten. The Council now elected will be the Council concerned in arranging the International Conference of Architects to be held in London next year. We put it to those who are so anxious to secure the supporters of their own shibboleth at all costs, how do they think it would look to architects from France and Germany, to find that the distinguished architects whose names they know are all outside of the Council, and that the official body of the Institute consists mainly of people they have never heard of?

The Thames
Conservancy
Bill.

In view of the intimation from an authoritative source that the objects of the London County Council Bill are too sweeping for consideration in a private measure, it looks very much as if the needs of the Port of London will not receive adequate attention for some years. For this reason the Bill of the Thames Conservancy acquires fresh importance. By abandoning all the clauses which deal with the upper river and retaining only those intended to authorise the board to carry out the scheme of dredging a channel between the Nore and Gravesend, the promoters have had the satisfaction of seeing the Bill passed for second reading. If finally entrusted with the powers desired, the Thames Conservancy will be enabled to effect a much-needed improvement at the moderate cost of about 400,000*l.*, and the way will be as much open as ever for a comprehensive measure dealing with the port generally. As a purely temporary expedient the Bill deserves support. It is a thousand pities that any makeshift should be necessary.

Strikes
and
Trades Unions.

THE law of trades unions is in a transition state, and offers conundrums impossible for the lay mind to solve. The Court of Appeal have now reversed the judgment in *The Denaby and Cadeby Main Collieries, Ltd., v. The Yorkshire Miners' Association and Others*, in which the plaintiffs on the findings of the jury had recovered damages against the Association and others for having brought about and then maintained a strike. The Court of Appeal were unanimous in finding on the evidence that the defendants were not liable under the first head, and that the branch unions had acted independently in starting the strike; but the question of principal importance is whether by having granted strike pay they were liable as having assisted to maintain the strike, and on this point the Master of the Rolls dissented from the majority of the Court. The Master of the Rolls held that the Association were liable for the illegalities perpetrated during the strike by having, with full knowledge of the facts, supported the strike by allowing

strike pay, but Lord Justices Mathew and Cozens-Hardy came to an opposite conclusion. The case is, of extreme importance, since the finding as it stands amounts to this, that the subscribers of money to any cause are under no legal liability to third parties, even although they know that the cause they are supporting is being carried on by illegal methods. A stay of execution was asked for, and no doubt this case, like so many of the recent cases on the law relating to trades unions and strikes, will be carried to the House of Lords.

Report on the
Aylesbury
Railway
Accident.

AS WE suggested in a "Note" on page 4, the immediate cause of the derailment which occurred at the Aylesbury curve, in December last, was the excessive speed at which the train was moving. Colonel Yorke, in his report on the accident, confirms this forecast, and states some opinions which we trust will receive the careful attention of the railway companies concerned. From the evidence given at the Board of Trade inquiry, it appears probable that the unfortunate driver of the train failed to reduce speed owing to lack of familiarity with that section of the line in which the curve is situated. We entirely agree with Colonel Yorke that the curve, although not dangerous for local trains stopping at Aylesbury station, is eminently unsuitable for the fast trains of the Great Central Railway, and that the Metropolitan and Great Western companies ought to construct a new junction between their respective systems. The companies know this as well as Colonel Yorke does, and have brought forward several schemes for improving the line, but have never been able to decide upon concerted action. Now that a serious accident has taken place they may perhaps awaken to a sense of their duty. Colonel Yorke considers the curve in its present condition to be a distinct source of danger even for the speed of fifteen miles an hour. Hence the public are clearly entitled to demand the immediate modification of the existing curve and the construction of a new approach without further unnecessary delay.

Tramways
etc., of Wandsworth
and the Roads.

IN the case of *The Mayor, etc., of Wandsworth v. The London United Tramways* (1901) the local authority raised an important question as to the powers of the tramway companies to break up the roads for all purposes of the undertaking. The Tramway Company had given notice to break up certain roads for the purpose of connecting their tramways with a power station belonging to the Underground Railways of London Co., but the plaintiffs applied for an *interim* injunction to restrain them from so doing on the ground that the company had no power to break up or disturb streets except where they were empowered to lay the tramlines themselves. The Tramway Companies Act, referring to the district in question, incorporated section 27 of the London United Tramways Act, 1901, and the decision turns on the effect of that section, and the Court has held that the latter part of this section contains general

powers, as contrasted with the special limited powers contained in the earlier part of the section, which give the company the right to connect with a generating station, which need not necessarily be that of the company. When Parliamentary powers are granted which will interfere with or override the rights of the general public they should be given in clear and specific terms, and in this particular case it would appear that when the Act affecting this district was applied for only those householders and owners of property on the direct line were affected with the notices required by the Parliamentary standing orders. The result of the decision would appear to be that the owners of property in the streets affected by this deviation had no opportunity of being heard or of protecting themselves at the time the Bill was applied for.

At the head of the Jamrao Canal, in Sind, some extensive masonry works have been constructed for the purpose of regulating the supply of water from the Eastern Nara, an old river-bed now used as a main or feeder canal. In order to insure the efficiency of the canal regulator, it was necessary to build about three miles of flank embankments to confine the ordinary supply and the flood discharge to the required channel of the Nara, for this waterway is exceedingly apt to change its course and to split into branches among the mobile sands between its banks. Training walls were also required to direct the flood water to the weir and to prevent the river from undermining the embankments and out-flanking the works. The weir across the main channel is 1,250 ft. long, and is so designed that the maximum depth of water shall be next to the Jamrao Canal regulator. All these works are built on sand, the embankments being simply faced with earth and brick pitching, while the weir consists of a thin crust of masonry laid over the sand, with sheet piling on the upstream side and a row of well-blocks with sheet piling between them on the downstream side. An interesting feature is the apron on the downstream side of the weir, this being made of separate concrete blocks, which, having only mud joints, are free to settle in case the level of the supporting sand should be lowered by scour. Blocks were used instead of a continuous mass of concrete, so that their settlement might prevent the works from being undermined, an object which seems to have been satisfactorily attained.

WE have often pointed out the trying conditions under which surveys have to be conducted in undeveloped countries, where the surveyor has none of those adventitious aids so amply provided at home. He has always to display resourcefulness of no mean order, and very often to undertake athletic feats involving considerable powers of endurance. This aspect of survey work is well illustrated by the paper read last week before the Geographical Society by Major Ryder, R.E., on the subject of the surveys recently carried out in Tibet. Major Ryder shows that much of the work was accomplished in the face of very adverse

circumstances. The triangulation of one district necessitated the climbing of rugged and lofty mountains and the taking of observations at the top in a bitter wind; one river was crossed with the utmost difficulty owing to the masses of ice whirled down by the rapid current, and at times the cold was very severe, the minimum temperature recorded being 56° of frost Fahrenheit. Worse than anything, however, was the biting wind, in which the warmest clothing seemed of little use. Work was conducted under such conditions for days and months without intermission, testifying to the energy and determination of the officers and staff. Apart from its general interest, this paper is of special value to surveyors.

Mr. Hunt's
Lady of
Shalott.

MR. HOLMAN HUNT'S latest picture, "The Lady of Shalott," now on view at Messrs. Tooth's Gallery in the Haymarket, is one of the finest things he has ever done. All the famous pictures by this remarkable painter we have not been able to admire to the extent which is the fashion. In some of them he seems a great painter, or a painter with great ideals, who has wrecked himself to some extent by a wrong system; an endeavour to paint every detail to an extent which destroys breadth and balance of effect, and leaves the face and limbs of a figure with a dead leathery aspect which is not that of life. And we must confess that the moral meanings attached to his religious pictures have seemed to us often too childlike (we will not say "childish") for any but children. And in this picture also there is an immense amount of detail painted with extraordinary force and brilliancy, but then it is essentially a foreground picture, and the detail is all interesting and significant; and it is beautiful. The figure of the lady, with the kind of rich peacock feather cuirass which she wears, and her mass of brown hair blown above her head as if by the wind of the spell which waited away the web, is very fine and romantic; it suits the poem; and the bare feet are beautifully painted. Also the landscape in the mirror is really a landscape in a mirror, and not too highly finished to lose distance and air. By a happy thought, the contrast between mirrored daylight and open-air daylight is brought out by the introduction of the small opening in the wall at the top of the scene, showing the real blue sky and a bit of cloud through it; thus assisting the effect of the mirror. It is the finest illustration of Tennyson's beautiful and fanciful poem that has ever been painted.

The
Goupil
Gallery.

AT the Goupil Gallery there is a collection of two groups of works by a lady amateur, Lady Gray Hill, which give evidence of very unusual versatility of talent. There is a collection of pictures, some in oil and some in water-colour, of Syria and Egypt, which certainly have a little of the character of amateur work in their simplicity of scheme and avoidance of detail, but which nevertheless convey the impression of truth of observation and representation; they seem to bring before us the arid and tumbled wastes of the wilderness of Judaea and

the Red Sea Coast as they actually appear to the eye that sees them; for even without knowing a country oneself one may receive from the very manner of a picture an impression of truth or the reverse; and these give the impression of truth. One wall of the same room is entirely occupied by a series of decorative panels of flowers painted in oil by the same lady—as different kinds of thing as possible from the pictures, but these are equally good in their way effective in arrangement and very fine in colour; we may especially mention "Amaryllis" (69), "Tawny Chrysanthemums" (81), "Yellow Chrysanthemums" (87), and "Sweet-peas" (96). In the same gallery is a collection of small landscapes in oil and one large one by Mr. Robert Fowler. Of the small ones the best is "Catherine Rock Tenby" (20), not only a fine freely handled landscape but a very truthful representation of the place. "Yacht Menai Straits" (25) and "Near Penryn Castle" (33) are among the best of the others. The large picture "Royal Windsor" (32) does not satisfy us, but it is difficult to say exactly why; perhaps the painting of the castle, which fills up the background on the other side of the river, is a little too scenic in effect and lighting.

The Leicester
Gallery.

AT the Leicester Gallery is a collection of paintings, pastels, and water-colours by the late Mr. Boughton. The larger heads and half-lengths show that cold whiteness of colour in the face which was mannerism in this artist's pictures; women; we prefer the smaller-scale figures. Several of these illustrate very well Mr. Boughton's way of planting a single figure in a landscape of which forms, as it were, part of the expression. Of this class are "The Coming Storm" (44), where a girl sits by the seaside and looks anxiously toward the storm quarter; "Meditation" (45), a very pretty girl standing in the middle of a moorland scene; and "A Grey Dove" (53). Among some landscape studies may be especially noticed "Marshland in Winter" (15), a composition of parallel lines, and "On the Spey" (17). In another room in the same gallery is a collection of water-colour drawings of "The Cathedral Cities of England" by Mr. R. W. Collins. We can hardly see these first-rate drawings of the cathedrals where these form the principal elements of the picture; the best are the ones showing bits of the cathedral, such as "The Old Bridge over the River Chester" (15); "Old Houses" (16); "The Bridge, Durham" (23); "The Market Place, Wells" (32); and "Booth Bay, York" (37), with the cathedral towers showing over the houses. Of the cathedrals the best drawing is perhaps "Norwich—from a Canon's Garden" (76); but in general the indication of architectural detail is not very carefully given; the old houses and corners are better treated and seem to be more congenial to the artist's style.

The
Fine Art
Society.

AT the Fine Art Society one room is occupied by Mr. Kemp-Welch's vigorous and

in the New Forest," exhibited at the Royal Academy, and a number of interesting studies of horses, dogs and cattle, some of the original studies for "Timber-hauling" being included. Among the best are "Study of a Sheep" (37), "Low Tide at St. Andrews" (11), "capital study of boats a-ground;" "Study of Pasture" (35), "Study of Black" (37), and "Study of Gull Alight" (57). In the same gallery is a collection of water-colours by Mr. A. J. Browne illustrating scenes in South Africa. But for the sea pieces, we have classed these among what are called topographical pictures—illustrations of places rather than landscape—painting in the higher sense; but all those in which the sea is prominent are very good, and we should think the artist's power lies in that direction. There is, however, a fine representation of a wooded scene in "Yellow Woods along Gedultz River" (7), and in "A Day, Worcester" (35), the effect of strong sunlight is very well conveyed. Illustrations of South African scenery in this collection has of course a special interest at present; it tells us something of the scenery of a part of the world with which England has become very closely connected.

At the Lefèvre Gallery (1A, King-street, St. James's) there is a small exhibition of pictures which contains some fine pictures of the modern Dutch School. There is a very upright landscape by W. Maris, "Cattle Drinking," on a much larger scale than is usual with this painter; it is nearly all sky, and very fine, though unequal to the smaller "River View" in the upstairs room, which is one of the best works of W. Maris that we have seen. In the same room is a fine painting by Weissenbruch—"Low Tide." P. P. Meunier, a painter whose name is new to us, appears to be a follower and imitator of W. Maris; and, as far as his pictures are concerned, a very successful one. There are other works worth attention in the rooms, which are unfortunately not very well lighted for exhibiting pictures, not having been built with that object.

At Messrs. Dowdeswell's Gallery is a collection of water-colour drawings of designs by Mr. Maurice Greiffenhagen, which we looked to with some interest, in view of the artist's very original manner as an oil-painter, and with which we were much disappointed. They are drawings in a peculiar mannered style which conveys no idea of atmosphere or distance, with a treatment that produces somewhat the impression of their being produced by flat inlays of different coloured material. They are not commonplace, certainly; but they are eccentric and not satisfying either to the eye or the judgment.

MR. AND MRS. NELSON DAWSON have on view at 111, Jermyn-street a collection of some of the metal-work and jewellery recently made by them. The jewellery consists of necklaces, pendants, and other ornaments, partly decorated

with precious stones, partly with translucent enamel. The enamel, with its iridescent colour, has a beautiful effect; in a decorative sense it is perhaps preferable to the stones; and we were struck with the delicacy and variety of the gold and silver chain-work with which the ornaments are suspended; showing how much invention may go to the mere designing of the form and proportions of chain-links. It is almost needless to say that there is no imitation of natural forms in this work, such as pervades M. Lalique's splendidly executed work mentioned last week; it is all pure decorative design. Among the silver-work in the shape of caskets, cups, spoons, etc., are some admirable things, in which the same good taste in form and design is everywhere apparent.

ARCHITECTURE AT THE ROYAL ACADEMY.—II.

AMONG the designs for public buildings not already noticed is an admirable one by Mr. Leonard Stokes for "Town Hall Chelsea: Proposed Extensions" (1518). There is no plan to show us exactly what the "extensions" are, but the front as shown in this perspective view is a model of architectural refinement and good taste. The stone-faced pavilions at the ends, decorated with an order, are cut off from the centre portion by a quarter-curve on plan; the centre portion is in brick with a medallion cornice, stopped against the end pavilions, the windows very simply treated but with little points of detail which remove it from the commonplace; in the centre a clock is projected, in the old-fashioned manner, at right angles to the building. The same architect's "Grammar School at Lincoln" (1535) is shown in an excellent water-colour drawing; a building with a deep-set round-arched loggia on the ground story and large mullioned windows above, promising plenty of light; the whole completely scholastic in expression. Messrs. Mitchell, Raine & Payne's "Proposed New Town Hall, Durban" (1611) is probably a competition design—effective as such, but rather "mixed" in composition; no plan. Mr. Paul Waterhouse shows a perspective view of the "Medical School and Nurses' Home, University College Hospital" (1623). The front is accentuated at the centre and ends by pavilions with an order; pilasters at the ends, columns in the centre, each column with four large boxes on its lower portion in the shape of rustication blocks, according to a fashion now prevalent; it has a bold effect, no doubt, but somehow seems to suggest that something is unfinished in the execution. The intervening portions are treated in a picturesque manner, stone in the lower portion, brick above; the grouping of the windows in the lower portion is original, but does not seem quite to belong to the rest of the design; it is a pity that no plan is furnished in the case of building where practical arrangements must be so important. But this is the case over and over again, nor is there any improvement in this respect in the architectural room; in the majority of cases it seems to be considered sufficient to show the external form and treatment of a building, but as to what this expresses and what it is based on we get no information. Mr. Owen P. Parsons's "Competition Design for City of Wakefield Library" (1629) is a very pleasing design, in a good masonic style of treatment, with a low octagon cupola over the centre; the whole is rather American in taste, which is saying well for it, for American architects treat this class of building, in general, exceedingly well. Messrs. Harris & Towse also deserve praise for their second premiated design for Torquay Municipal Offices (1408), a design, architecturally speaking, in one story; a low rusticated front forming a curved sweep on plan, and treated with considerable power and in a style well expressive of municipal offices. Mr. Dare Bryan's "Western Theological College, Bristol" (1632) is explained by a small plan, which shows the clever treatment of an angle site, and the building is picturesque in grouping and effect, but the two octagonal turrets introduced, pleasing in themselves, do not arise out of

anything in the plan, but are only additions for the sake of the picturesque, which is not a true architectural treatment, though common enough, as we all know.

Church architecture is not very largely represented this year. The first example we notice is a small and what may be called an ostentatiously bad drawing, in thin scratchy pen line, showing "The Church of St. Stephen, Springfield, Wolverhampton" (1409), by Mr. C. R. Ashbee. This is an originally treated building, apparently in brick and with a West-end tower standing apart from the church and set askew to it, and connected with it by a flying gallery. This is picturesque, and if the author had only added a plan we might have been able to understand why the tower is so oddly placed in relation to the church. If there is no reason for it in the site, it is rather of the nature of manufactured picturesque. The belfry stage of the tower is treated with some power, otherwise the design is as plain as it can well be, and might have been just as effective with a little more attention to refinement of detail. A pencil sketch of another view of it, which, as drawing, is worse than this one, is hung in another part of the room.

A large frame contains plan, sections, and elevations of Professor Pite's "Christ Church, North Brixton" (1423), which is the most important exhibit in Church architecture. This is also a round-arched building, severe in treatment but not so destitute of style as the last-named (by "style" we mean that quality in design, not the adoption of any particular archaeological style); it is largely in brick, with some stone pilasters and mouldings, etc., and is based on Byzantine ideals. The side elevation does not explain itself very well, for it gives the idea (owing to the tinting) of there being lofty open arcades with recessed walls in the rear, but the plan shows that this is not so, only that the less structurally important portions have a darker tint. The large semi-circular windows, in which the glazing divisions are very effectively designed, give a great deal of character to the building. An octagon apartment in the centre of the long narthex develops effectively and suitably into a turret and cupola; but the larger octagonal cupola, near the east end, does not seem to us to have quite sufficient suggestion in the ground plan, and sits rather awkwardly on the sloping roof of the nave. However, this is a remarkable piece of work, and worth study. The sections are interesting; the vaults are shown in green and white brick, and the commentaments "writ large" upon the east wall instead of being confined to small panels. There may be different opinions about this method of doing it, which however has at all events the advantage of rendering the Mosaic Law visible and legible to all in the church, so that they cannot plead that it has not been brought under their notice.

Mr. Caröe's "Church of SS. Andrew and Patrick, Elvedon" (1433), is shown in a large pen line perspective very effectively drawn; the piers are treated in an original manner, with capitals of a Byzantine type and shafts which are panelled in niches on each face; there is a bold double hammer-beam roof decorated with angels with outstretched wings; we like both roof and substructure separately, but surely the former is rather ponderous for the latter, and seems somewhat to crush it. Mr. Tapper's "Church of St. Erkenwald," exterior and interior (1458 and 1641), was illustrated in the *Builder* of May 6, to which we refer the reader; it shows a very solid treatment of the interior, with internal buttresses with passage-way, arches in the lower portion, the arches over the windows springing directly from the sides of these buttresses without any impost; all this is very good—the Gothic spirit without the imitation of Gothic details; the lofty iron chancel screen has also a good effect; but it would have been more satisfactory if the drawings had shown more indication of the material of which the walls are built; as far as the drawing shows, they might be brick plastered over; perhaps they are, at all events there are no indications of built masonry or brickwork, either internally or externally.

Mr. Lidiard James's "Tower Church of the Ascension, Balham Hill" (1478), and Mr. E. Sedding's "Church of St. Mary Highweek, Newton Abbot" (1490), are both examples of the usual Gothic revival church, good enough as such, but presenting nothing for special remark; and the same may be said of Mr. C. J. Blomfield's "Rood-screen, Swaffham Prior

Church" (1485), a very good and carefully finished pen drawing showing a very correct late Gothic rood-screen, but which might just as well be old work as modern; that perhaps the author may consider the best commendation, but we confess we cannot see the use of continually doing over again what has been done before.

Messrs. Bradshaw & Cass's "Wesleyan Church Buildings, Castle-street, Bolton" (1925) is a solid and rather picturesquely arranged block, with a brick gable flanked by low castellated masses of brickwork, and a large window through the centre of which rises a stone erection containing niches and terminating in a canopy; there is a certain character in the group, and there is no filigree about it. We cannot see anything specially suitable for "A Country Parish Church" in Mr. Dudley's design so named (1931); we should have rather taken it for an interior of a town church, and the colour effect of the decoration shown is not very satisfactory. Mr. Fellowes Pryne's southeast view of "St. Martin's Church, Worcester" (1946) is a well executed water-colour view of a large church, apparently (from the colour) in flint with light brown stone dressings and bands; there is no plan; the large tower with a staircase angle turret is effectively introduced on the south side of the nave, over the south door; the lofty east end with its large buttresses and the traceried window in the upper portion (leaving a mass of wall beneath it) has a solid and dignified effect; but the building between this point and the tower is a good deal cut up into gables and wants a little more repose of line. This is a large and important church, and it is a great pity it is given without a plan.

In Mr. Oliphant's "Rood and Chancel Screen, St. Mary's, Houghton" (1943) we come across a little bit of artistic originality; a wooden screen with a lower arcade in late Gothic style, and a kind of balustrade above it broken by two gilded panels of armorial bearings (rather incongruous on a rood screen, but that may not be the architect's fault); a carved Christ in the centre and two figures at the foot, also breaking the line of the balustrade. Over the head of the Christ a broad band of gilt metal forms a half-circle. This is a good and effective piece of work. Mr. Horsley's "Church of St. Chad, Longdon" (1967), though a piece of orthodox Gothic, has individuality of architectural effect from the proportions of its tower and its low broad stone spire, which is like no other we remember. Mr. Temple Moore's "St. Wilfrid's Church, Harrogate" (1970), is a pencil drawing of an interior of a thoroughly orthodox Gothic type—archaeological architecture only, and not altogether faultless in regard to perspective. A "Sketch Design for a painted Rood-Screen" (1975), by Mr. Harold Gibbons, has a generally good effect and is a bold conception, but the drawing is too sketchy in execution for one to form a very good idea as to how it is worked out. Mr. Geoffrey Lucas's "Competition Design for New Church, Grantham" (1976) is an exceedingly simple interior of some merit, and the exterior (1938) is better, and a picturesque piece of architecture. Mr. Mileham exhibits an interesting water-colour drawing of the "Chapel of the Ascension, Heathfield, Ascot" (1991); we presume a private chapel in a large house; it is treated with a wooden ceiling in seven cants, divided into compartments by transverse ribs decorated in colour, the compartments being sub-divided by a flat band of stencilled ornament; the whole effect is good and suitable for the purpose of the room. What are Messrs. Nicholson & Corlette's "Additions to All Souls', Hampstead," in the absence of a plan it is impossible to tell, without paying a visit to the church to see its present state. Why cannot English architects do what French architects always do in such a case—give a drawing of the existing state of the building and another of the proposed alterations? Then we should know where we were.

Mr. Marshall Mackenzie's "Design for a Domed Church" (1912), more or less reminiscent of Wren, was, if we remember right, an Academy medal student's design; it is good and correct according to the style chosen, but cold and wanting interest in detail; no plan is given. The Academy ought to require their students to exhibit plans with their designs; what sort of favour would a "Beaux-Arts" student expect who sent a perspective for exhibition without a plan? Messrs. Douglas & Minshull's "Memorial Baptistery, Buckley

Church" (1921) is a very good exhibit; no plan is necessary, as one sees the whole thing; it is a coloured perspective view looking into a small chapel paved with black and white marble, and with walls and ceiling effectively decorated by painting; the font, which is shown, is also of good design.

NOTES AND SKETCHES IN SOUTHERN ITALY.—X.

LUCERA.

THE ancient Luceria was one of the most celebrated cities of Daunia. It coined money and had its own peculiar laws and customs. Allied to Rome in the Samnite wars, it was the scene of several bloody battles, in one of which, in 434 B.C., the Consul Papirius, who had besieged the city, then occupied by the Sam-

nites, avenged the shame of the Caudine forks and liberated 600 Romans held captive in the castle. The Samnites tried to retake the city, but were defeated by the Consul Attilius, and those who escaped death were forced to pass, naked, beneath a yoke. Afterwards it became a Roman colony, and by resisting Hannibal gave so much assistance to the Republic that Livy reports praises given to it in the Senate at Comitium. Pompey massed his army here on the way to Brundisium and so to Epirus, and invited Cicero to shelter in Luceria as being a very secure place. It was the seat of one of the quaestors of Italy under Constantine, and was the metropolis of Apulia and Calabria (one of the ten provinces into which the diocese of Rome was divided). Its decline, however, commenced with the period of the Caesars, when the colonies became provinces of the

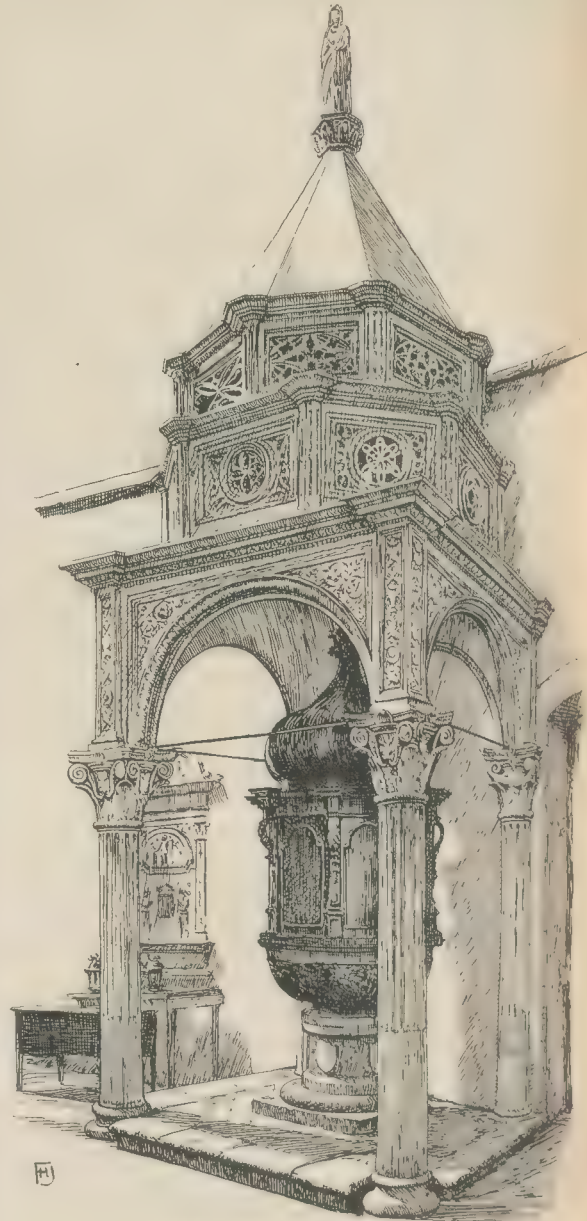


Fig. 1. Former Ciborium, Cathedral, Lucera.

Empire. There were temples to Apollo, Hercules, the Dioscuri, and other deities, coins, inscriptions, mosaics, and other remains of the antique period have been found. The city was destroyed about 612 by the emperor Constantine, but was soon rebuilt. After the Norman power decayed it formed part of the Kingdom and then its possession was shared between Byzantine and Lombard; the latter it was the seat of the Gastaldato of Apulia. The Normans took it from the hands of Benevento, and Frederick II. made it the strongest bulwark of his kingdom. It has the remains of ancient walls, but of its five towers only one, the Porta di Troja, of the period of Frederick II., remains. Mediaeval towers were here and there, and a few cupolas of glazed tiles crowning a little hill as one comes from Lucera, or rising above fruit-trees as one crosses on the vacant land which now stretches between the castle and the town. It has about 10,000 inhabitants; during the Suabian period they were estimated at 77,000. It is 18½ kilometres from Foggia and commands a territory which is rich in corn, fruits, and garden produce, and nourishes herds of cattle and flocks of sheep which produce a very fine staple of wool. Until 1806 it was the seat of administration for the two provinces of Capitanata and Molise, and its bishopric (now suffragan of Benevento) dates from the IIIrd century. The isolated rocky platform on which it lies rises suddenly, almost precipitously, beyond the town. Frederick II. brought Saracens from Sicily after he had repressed a rising which they had attempted. He assigned the towns of Lucera, Grottole, and Acerenza for their dwellings, but they fled back to Sicily secretly. He brought them all to Lucera between 1233 and 1245 and called the place Lucera Christianorum, having built the castle a few years

earlier (commenced in January, 1233, according to Richard of San Germano). The garrison was the permanent nucleus of the imperial army with its light cavalry which fought with most useful when at war with the church, and in many expeditions they sacked bishops' palaces and monasteries, for excommunications and papal anathemas were powerless weapons to use against them. The church demanded their conversion to Christianity, and Frederick allowed the Franciscans to come to Lucera as freely as they pleased, but welcomed at his table equally bishops and Saracens of distinction. The interference of the Popes in politics was found most irksome by all monarchs—a letter of Frederick's to his son-in-law Vatazes runs:—"O happy Asia! O happy monarchs of the Orient! to whom the invention of the Papacy does not provide vexations," and King Philip of France exclaimed somewhat later, "O happy Saladin! who has nothing to suffer from the doings of the Popes." These Saracens fought for Manfred, receiving him in 1254 when he fled from Aversa, and proclaiming him as their lord. Subsequently he took Foggia and drove the Cardinal legate Guglielmo Fieschi from Troja. He was called Sultan of Lucera by the priests and by Charles of Anjou. Here he left his wife, Elena of Epirus, and his sons when he went forth to the fatal field of Benevento with many Saracens in his army. After his death she fled to Trani, to take ship for Epirus, where the Castellan with less loyalty than that shown by the Saracens, gave them up to Charles. The Lucerans made a treaty with the latter by which they were to continue as his subjects under the laws and institutions of the Hohenstaufen, but when Conradin appeared in Italy their loyalty to the ancient dynasty tempted them to raise the Suabian standard again. Charles I. of Anjou deter-

mined to punish them, and for a year besieged Lucera. Pope Clement IV., having blessed the undertaking, preached a crusade against them, and sent the Host under the charge of the Abbot of Monte Cassino. On August 29, 1269, they were obliged to capitulate through famine. Charles strengthened the castle and made it the royal treasury, and a great part of the remaining walls is due to him, but he did not banish the Saracens, who served him as archers on foot and on horseback, although they had risen again in 1271 in favour of a false Conradin. In the war of the Sicilian Vespers they fought loyally for Charles. They were expelled by Charles II. in 1300 in response to the repeated demands for the extermination of the Pagans made by the Pope, and the name of the town was changed from Lucera Saracenorum to Christianorum or Civitas S. Mariæ, by which it was known until 1463. When, without any reason, the citadel was attacked and taken by storm, nearly all the warriors perished in the nine days' fighting, which lasted from the Assumption to St. Bartholomew's Day, in the streets and under the walls of the donjon. The commander, Giovanni Pipino di Barletta, was charged to complete the depopulation of the town. Those Saracens who accepted Christianity were well treated and freed from taxes; distributed among the villages of Apulia and the Capitanata, they formed separate communities and were known as "marrani" until the beginning of the XIXth century. Those who declined conversion were sold as slaves with all their property. There is a document preserved at S. Nicola, Bari, bearing date January 21, 1301, in which orders are given for the liberation of certain male and female Saracens who were detained at Barletta. They are ordered to be sent to their relations, Abd-ul-Aziz of Lucera, who had been converted and made a knight under the name of Nicholas. In the latter part of the document this Nicholas is ordered to collect Saracen artists and artificers from among the population, buying them, if necessary, and sending them well guarded to Naples. Among the artists desired were to be leather-workers and embroiderers, bow-makers and armourers, and builders who worked in stone and wood, denominated "magistros," who, no doubt, had had a hand in building many of the edifices of Frederick II.'s reign, which still extort so much admiration for their beauty.

The castle stands on a spur of the hill, commanding a most extensive view, on the site of the Roman citadel, and is defended on the side of the town by a deep fosse. It has three entrances, two of them simple gates at north and south, and the third towards the town so arranged that besiegers would have to approach with the right, the undefended side, towards the flanking wall. The older part has fifteen towers, thirteen of which are oblong in plan, the remaining two, at the angles away from the town, are hexagonal. Towards the town there are two great round towers at the southern and northern corners, and seven others somewhat like bastions with a beaked front, which project from the wall. Near the entrance is a later square fort, pierced for cannon, which on one side forms part of the wall. Otherwise the interior is empty. The fortified gate resembles the Porta di Napoli at Sulmona. This gate still preserves the porticulis groove, inner and outer arch with space between, and an outwork below where the drawbridge crossed the fosse, the wall of which has fallen away disclosing an internal stair to a lower level. The drawbridge was made in 1281-2 under the direction of "Nicolaus de Constantinopoli" and "Tibaldum de Alemania, magistros ingenierios."

The walls are built of brick with stone quoins, the round towers at the angles are of ashlar, and the battering bases also. The intermediate towers have loopholes at the angles. This side towards the town is part of the rebuilding ordered by Charles I. after 1269. His two architects were Riccardo di Foggia and Pierre d'Angicourt "protomagister et eques." The other three sides are due to Frederick II., built between 1233 and 1240. One of the towers bore an inscription which is reported by Alberti as giving the date of 1271, but twenty years later work was still going on. It was nearly a perfect square in plan. In 1525 Leandro Alberti found it in ruins and a resort for beasts. We found a goatherd in possession with his flock of goats. The stone of the square fort, which probably occupied the site of the palace where the Saracen castellan lived, was used to build the modern law courts in the city.

About 1300 Charles II. promised new

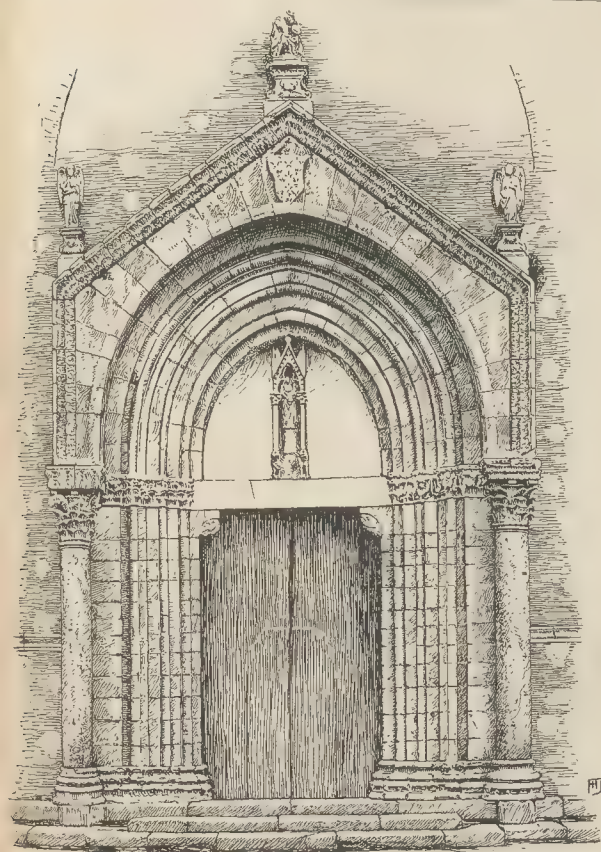


Fig. 2. West Door, Cathedral, Lucera.



Fig. 3. Courtyard of Bishop's Palace, Lucera.

inhabitants freedom from taxes for the first ten years and the cathedral was then begun. It was consecrated in 1302, but in 1316 was still unfinished. The style is almost pure French Gothic of the XIIIth century. It has a choir, two side chapels, transepts, and nave of six bays with aisles. The choir is pentagonal, with little tower buttresses at the sides surmounted by belfries, which divide it from the flanking chapels, which are of the same shape. They are vaulted with pointed ribs and the vaults are slightly domical. The ribs spring from angle columns with low caps and octagonal abaci. The vaults are painted with subjects from the life of the Virgin. The windows are single-lights, splayed, and cusped and trefoiled in the heads. There is one in each chapel and two in the apse, between which is a larger one of two lights with a rose in the head. In the nave and aisles the windows are without tracery. At the end of the transept a similar two-light window to that of the apse occurs. The arches are pointed throughout, and those in the nave and transepts are moulded. The great arches of the nave have columns with a central ring at the height of the string beneath the apse windows. Below this are columns of *verde antico*, fourteen in number, which came from the ruins of the ancient Luceria, believed to have been used in a mosque which stood in this place during the Saracen period on the site of the original cathedral. Other columns of *capollino* were found near during the XVIIIth century. The nave piers are oblong, with a low cap well carved with foliage and with engaged columns on which the inner mouldings fall. An attic base is common to both, following the plan. The outer arch has a hood-mould; the inner is a good deal chamfered. M. Bertaux sees great similarity between the details of this church and of S. Maximin, Véz, and remarks that there these details are reversed, there are no leaves, and instead there is a vaulting shaft. The transept and nave are roofed with wood, the aisles are vaulted. The high altar is one very large piece of marble, said to have come from Castel Fiorentino, where Frederick II. died, and to have served as his table. There are two side altars in the transepts, with colonnettes of black marble in the reredos, which, we were told, were worth their weight in gold. At the western end are two reliefs flanking the main door, against the wall, supported by the lower parts of Early Renaissance columns which

belonged to the monument of Charles II. of Anjou. The only other part of this monument remaining is the effigy which is at the side of the door of the north aisle clothed in armour. The inscription on the pedestal runs: "Carolus Andeavensis. A.S. MCCC. Templum Deo et Deipara dicavit." One of the reliefs appears to be of the XIVth century—it is of stone and is painted, called the "Madonna della Stella"—the other is later, a "God the Father." The ancient ciborium (Fig. 1) is now at the western end with the font beneath it, and in the wall near a pretty receptacle for holy oil of architectural design and in the style of the *cinque cento*, carved in marble. It shows a curious mixture of late Gothic pierced panels of beautiful design and Early Renaissance pilasters, caps, and arches, all worked with great delicacy and beauty. There are a few indifferent pictures of some antiquity, and beneath the eastern end of the church is a crypt.

The building is of brick except the piers, arches, angle quoins, and framings of openings, which are of limestone. The façade has a slightly projecting tower to the south; at the opposite side is an octagonal turret. The three doors (Fig. 2) have stilted pointed arches with hollows and torus mouldings answering to thin colonnettes in the jambs. Above each is a gable; that on the north rests upon pilasters, that in the centre on large pillars which are not Gothic at all, while that on the south has only impostes to support the moulding. The tympana are smooth for paintings, but in the centre one is a little tabernacle for a (restored) statue of the Madonna. The material used is a dark travertine. The architrave rests on dragon corbels, and at the top of the arch is a shield with the arms of Charles II. of Anjou—lilies on a tilting shield. Above the north door is a pointed window with a projecting moulding except at the base and with a rose filling the arched part; above is a horizontal cornice with brackets or corbels, which strikes in its centre a large rose window which occupies the middle of the gable, bricked up except for a small circular moulded opening. The tower is square up to the springing of the gable of the nave; just above this level is a bracketed cornice and a dwarf wall, above which is an octagonal lantern. The square portion has three stories above the door. The first has only one little window with a round head and framing mouldings, which looks quite early. The second has

windows of two lights of the same date as the central colonnette; a panelled string course then goes down to the dividing string course. In the top story is a large pointed window with trefoiled angular mouldings; the upper part has trefoil with oculus above, which is also folio. The lantern has similar windows on all its face without impostes, and the north side window of the same pattern. It terminates with a brick pyramidal top with four dormers, and the turret finishes in a similar manner. When we were there shortly after Easter a branch of olive was tied to the cross which surmounts the campanile, and one rather wondered how it had been done, as there appeared to be no provision for scaling the pyramidal top. Opposite the cathedral is the Bishop's Palace, which has a courtyard (Fig. 3), *rococo* in style but rather grandiose.

The church of S. Francesco is very lofty and consists of a single nave without side chapel. It has a pentagonal choir with a painted vault, but the nave is roofed with wood. The facade shows a pointed door with one rose window above it. Here also the altar-stone is said to have come from Castel Fiorentino.

F. H. J.

CHURCH HOUSE, BANDURY.—This building has just been completed and is owned by Mr. J. F. Kimberley, who secured the contract for its construction by Mr. W. E. Mills, the architect. The building has been carried out from designs prepared by Mr. W. E. Mills, the architect. The building is a hall runs north and south, and is lighted by hall lights and by the oriel window in the south front of the building. It is 62 ft. by 31 ft., excluding the platform, which is a permanent structure 31 ft. wide by 15 ft. deep. The height of the hall, when the ceiling is in the shaped plaster ceiling, is 22 ft. 4 in. in the centre. At the south end of the hall is a gallery 14 ft. deep. At the back of the hall a suite of small apartments is provided by the adaptation of an existing cottage. These communicate with the platform of the hall, or independently with the main building by a subterranean passage. The portion of the building on the right of the platform is devoted to a room suitable for small meetings and other small apartments, while a storage room is provided in the basement. An emergency exit has been put in near the south-west corner, in order to meet the requirements of the local authorities.

HOME ARTS AND INDUSTRIES EXHIBITION.

The twenty-first annual exhibition of the Home Arts and Industries Association is being held this week at the Royal Albert Hall. It is always an interesting exhibition, and the present one in many respects is as interesting as any that have gone before. Industries that have otherwise dropped out of existence are revived, and, in some cases, with renewed vigour and good results. All intelligent handicrafts in the lesser arts is worthy of encouragement at a time when the machine dominates every branch of life, and the further the objects of daily and homely use are removed from mere mechanical reproductions the better for the maker and the user. One of the objects of the Association is to find employment for people in unfortunate circumstances, such, for instance, as disabled soldiers and sailors, or for cripples, work done by whom is shown in great variety at the present exhibition. What we are concerned with, however, is the value of the work done from the point of view of the handicrafts, and in this respect there is much to regret as well as to admire. A large proportion of the exhibits are work which, from our point of view, were not done, or at any rate better not exhibited under the auspices and with the sanction of the "Arts and Industries Association." No doubt it is difficult, in out-of-the-way primary districts, to obtain the skilled supervision and a knowledge of the structure of things necessary to inspire good and useful work; where this is impossible surely money might be supplied, and occasional visits paid to some body of competent advisers. Most of the work shows talent which, rightly directed, might be useful and pleasurable to both maker and purchaser, and prevent a deplorable wastage of time and ability. It is with satisfaction that we note the really valuable exhibits shown. First among these are the scholarly and refined work of Mr. Edmund Hunter and his fellow-weavers. Significant are the design, colour, and texture of the materials. We see a revival of the class of work that was being done prior to the XVth century, yet without the affectations of a revival. No less interesting in a more quiet and homely way are the other weaving exhibits. Some good embroidery comes from Langdale. In leather work the best shown is the beautiful Della Robbia Pottery is of considerable interest and capable of development. Among the humble class of exhibits the baskets from Sacmundham and Pimlico are noticeable, and the toys from Chisleigh delightful. Stepped, as usual, in woodwork section with other picture inlays. Among other classes of pottery to that previously mentioned are those from Birmingham and Castle Headingham.

THE SHERBORNE COMMEMORATION.

In commemoration of the 1,200th anniversary of the founding of the town, the bishopric, and the school, a "pageant" in the form of a play, written by Mr. Louis N. Parker, and dealing with the chief historical events associated with Sherborne, will be performed on the 13, 14, 15, in the ruins of the castle. King Canwalh, King of Wessex, established the house for secular canons in the Saxon Sycetrum, the *Pons darlus* of the Latin chronicles. In the King Ina and his consort appointed his son, St. Ealdhelm, first bishop of a see which then comprised the counties of Dorset, Wiltshire, Wilts, Devon, and Cornwall. Around Ealdhelm's cathedral, of which only a doorway remains, incorporated with the west wall of the castle, at the end of the north aisle, arose the capital of the western kingdom. At the close of the Xth century, temp. Bishop Wulfstan, King Eadward displaced the canons for Benedictine monks. In or about 1075 William I. and Bishop Herman transferred the seat of the see to Old Sarum, whence it was again moved in 1227 to Salisbury. In the meantime the rebuilding of Ealdhelm's minster was begun, in 1171, by Bishop Roger of Caen, who retained the site of the former west wall.* Roger's church consisted of a nave of five bays with aisles, north and south transepts, with the square-ended Wyckham and Sepulchre chapels projecting from their east sides, a tower at the west end of which the piers remain, a choir,

and ambulatory. "Bishop Roger's Chapel" and the Lady Chapel were added during the Early English period, and in the later half of the XIVth century the Church of All Hallows was erected at the west end of the Abbey Church, dedicated to St. Mary.

In a letter printed in our columns of April 17, 1897, Mr. B. Wildham stated that he discovered from the old parish accounts that the materials of All Hallows and its tower were sold for building-stone in 1542-1551; he conjectures that the tower stood at the west end of All Hallows, a passage or porch separating the two churches, in which case the plan resembled that of Wimborne, presenting the rare combination of a central tower and one western tower. An inscribed brass in the floor of Abbot Bradford's presbytery marks the graves of Ethelbald and Ethelbert, brothers and predecessors on the throne of Alfred the Great, who, it is said, had his education at Sherborne School. By the bounty of the Digby family, of Sherborne Castle, a restoration of the abbey was carried out in the interval 1848-86. Mr. R. C. Carpenter restored the nave and transepts; Messrs. Carpenter and Ingelow repaired and strengthened the tower; and Mr. W. Slater restored the choir; the tower, which the architects described in their report (1884) as "a very poor piece of masonry" of Maperton and local stone, contains the great bell given by Wolsey. Carpenter designed the reredos of Caen stone, and Pugin the stained glass, the "Te Deum," for the south transept window. At the suppression, the revenues being valued at 682l. 14s. 7d. per annum, Sir John Horsey, of Clifton Maybank, near Yeovil, as grantee of the Crown, bought the abbey for 100 marks, and sold it to the townspersons for 250l. as their parish church. By letters patent of Edward VI., May 13, 1550, Ealdhelm's school was refounded as the Free Grammar School, and four or five years afterwards the governors of the school acquired some of the monastic buildings on the north side of the abbey church, as well as the chapter-house, the Lady Chapel, and the adjoining Chapel of St. Mary-le-Bow. The old schoolroom, 1676, stands on the site of the abbey gatehouse; on the west side of the court are the library (formerly the guest-house) and the chapel (formerly the abbots' hall). In 1853 Carpenter restored, for classrooms and studies, what had been a silk mill appertaining to the monks; about twenty-five years ago a new schoolroom was built on the west side of the Great Court. The castle, originally built, it is believed, by Ealdhelm, became the Bishops' Palace in the time of Roger of Caen; a deep moat encompasses an extensive plateau measuring about 100 yds. by 150 yds. The ruins are those of the fortress that was dismantled in 1645 after its capture by Fairfax, and had been erected, octagonal on plan, upon elevated ground on the east side of the town. The castle, seized by King Stephen, and retained for a long period by his successors, was recovered in 1350 by Bishop Wyvil. The manor, alienated temp. Elizabeth, was bestowed upon Sir Walter Raleigh, who built the manor-house—his coat-arms and date "1594" are extant over a window. The house, H-shaped on plan, and having four hexagonal turrets at the ends, became Sherborne Castle, a seat of the Lords Digby, through the alienation of the manor by Carew, second son of Sir Walter Raleigh, in favour of Robert, Lord Digby, of Geashill, in the King's county, Ireland, whose descendant, Henry, was created in 1765 a peer of Great Britain as Baron Digby, of Sherborne, and in 1790 was advanced Earl Digby. The house has since been enlarged, and the turrets were connected with the wings.

A VENTILATING SASH.—Messrs. W. & T. Avery (Birmingham) send us a model of their contrivance for keeping a sash window partly open for ventilation, without leaving it movable from outside. Their fastener, called "The Lorie Ventilating Fastener," consists of a metal plate fixed up the inner face of one stile of the upper sash, and a screw fixed on the lower sash, with a small turning lever by which the screw can be pressed against a point on the vertical plate so as to clamp the sash immovably. We presume it is with this object that the surface of the plate is artificially roughened by an ornament in relief, which also (quaintly) covers the screw lever; it would be better to have a simple series of holes in the plate, and keep the screw lever quite plain. As it is, the thing looks unworkmanlike, though in reality it is a perfectly practical device.

ENGINEERING STANDARDS COMMITTEE: Two New Reports.

THE Report No. 20, dealing with British standard screw threads, does not complete the work undertaken in respect of screw threads, as the Sectional Committee to whom this important subject was relegated in February, 1903, have yet to publish the conclusions derived from an extended consideration of the data collected relative to the limit gauging of screw threads and plain cylindrical surfaces. Hence the present report deals only with the form and pitch of screw threads most suitable for general engineering purposes. Having satisfied themselves by careful inquiries that the Whitworth thread is in very general employment throughout the country, and after taking evidence relative to other threads, the Committee came to the conclusion that the series of pitches originally devised by Sir Joseph Whitworth were admirably adapted for many engineering purposes and should be retained for all screws of $\frac{1}{4}$ in. diameter and upwards. This decision is one which we are quite sure will be approved by engineers and others.

Table I. of the report gives particulars of "British Standard Whitworth Screw Threads" (B.S.W.) from $\frac{1}{4}$ in. to 6 in. diameter, the values for the pitches and depths having been approximated to the fourth decimal place. The Committee recommend that all sizes above the diameter of $\frac{1}{4}$ in., which are not multiples of $\frac{1}{8}$ in., should not be generally used. This is an excellent suggestion, as it will tend to reduce the number of stock sizes without causing any practical inconvenience.

The investigations of the Committee had the effect of eliciting an almost unanimous expression of opinion that a series of finer pitches is very desirable for use in cases where the screw thread is liable to vibration and shock, or where additional strength is required in the core of a screw of any given diameter. With the object of meeting this evident requirement, the Committee have prepared a series of "British Standard Fine Screw Threads" (B.S.F.), in which the Whitworth form of thread has been retained. Table II. contains all necessary dimensions of the new standard threads for screws of $\frac{1}{4}$ in. to 6 in. diameter inclusive. For all screw threads of less than $\frac{1}{4}$ in. diameter the Committee have decided to accept the dimensions recommended by the British Association Small Screw Gauge Committee, particulars of these threads (B.A.) being given in Tables III. and IV.

The final report of the Committee will deal with the methods by which the accurate generation of the standard screw threads may best be performed, and with the means of securing satisfactory interchangeability between male and female screws, as well as with the question of limit gauging.

Report No. 21 deals with screw threads for iron and steel pipes, and also serves the useful purpose of specifying standard dimensions of pipes and tubes. This report is based upon a draft prepared by the representatives of the British Tube Association, and recommends that the existing form of Whitworth thread should be adopted for all pipe threads for iron or steel tubes made in accordance with the table contained in the report. Further, it is recommended that the same form of thread shall be used for pipes of copper, brass, and other materials; also, that the same pitches be adopted where the outside diameters agree and the thickness of material permits. In the simplified dimensions now settled the old Whitworth standards have been preserved as far as possible up to 24 in. nominal bore. In fixing gauge diameters for the larger sizes, the Committee have been influenced by consideration of the advantages to be secured by making the outside diameters of the tubes vary by even quarters of an inch. The present report also regulates the screwing of couplers and screwed connexions, and recommends that a complete set of standard gauges should be made in accordance with the sizes fixed and deposited with the Board of Trade or the National Physical Laboratory for purposes of reference.

Much trouble and inconvenience have been experienced by pipe users in the past owing to the lack of uniformity in the screw threads used by different makers of steam, gas, and water pipes, and we hope that the British standards now specified will be generally adopted by all manufacturers and insisted upon by all architects and engineers.

* For a full description of the fabric see the *Builder* (April 3, 1897, No. XXII, of our series: "The Abbays of Great Britain."

THE ARCHITECTURAL ASSOCIATION.

THE members' dinner of the Architectural Association was held on Thursday last week at the Criterion Restaurant, Piccadilly Circus, Mr. E. Guy Dawber, President, in the chair. There were also present amongst others Messrs. Cole A. Adams, Maurice B. Adams, Louis Ambler, A. H. Belcher, G. B. Bulmer, R. S. Balfour, J. D. Crace, Walter Cave, Max Clarke, H. Gregory Collins, A. Cox, A. O. Collard, R. Dircks, N. Forsyth, H. L. Florence, J. B. Fulton, J. S. Gibson, Leslie W. Green, H. T. Hare, Francis Hooper, Arthur Keen, W. J. Locke, G. H. Lovegrove, A. E. Munby, H. P. G. Maule, J. Murray, G. M. Nicholson, W. A. Pite, E. H. Payne, A. N. Prentice, E. A. Rickards, J. MacLaren Ross, Leonard Stokes, Hugh Stannus, H. Tanner, jun., R. H. Weymouth, and D. G. Driver, Secretary.

The loyal toasts having been honoured, The Chairman proposed "The Royal Institute of British Architects." In doing so he said that the Institute was something in the nature of a parent to the Association, as so many members had joined the Institute. The Institute had always been very kind to the Association, and for years past had given them an annual grant in aid of the work the Association was carrying out, and had generously helped with a munificent donation to the Building Fund. The members of the Association received kindness in every way from the Institute, and especially from Mr. Locke, and the other officers, who did not fail to send students on to the Association for instruction. With the toast he coupled the name of Mr. H. T. Hare, a Vice-President of the Institute.

Mr. Hare, in response, said that the Institute was very closely associated with the Association and regarded it with the greatest sympathy and wished to give it all the support possible. The ranks of the Institute had been and, he supposed, always would be, very largely recruited from those of the Association, and the Institute would look to the Association for its future members. As they knew, there was considerable division of opinion in the ranks of the profession on certain questions just now, and it was rather doubtful with many of them whether they would be able to retain their position—the position some of them held on the fence—but, whatever might be the outcome of the present controversy, members of the Association might regard it with the greatest equanimity. Every member of the Association was an educational enthusiast, and whatever qualifications should or might be imposed in the future in order to permit an architect to practice as an architect would be directed against those unworthy members of the profession who did not wish to study, and would not affect in any way the members of the Association. Therefore the members of the Association might regard the question with the greatest equanimity. Speaking of the students' publication, "The Purple Patch," Mr. Hare said he was pleased to notice that whatever might be the capacity of the coming members of the profession in the active exercise of the practice of architecture, that, at all events, the literature of the profession was perfectly safe in the future, and that they might look forward to the most brilliant articles in the architectural publications. Possibly it might be to the advantage of the profession if a little more attention were given to the study of colour decoration. The efforts of those who had produced that interesting publication were most highly appreciated, especially by those who were honoured by being referred to in its pages.

The Chairman then proposed the toast of "The Architectural Association." The toast needed no words of his to commend it to them, he said, for the presence of such a large assembly showed the interest that was taken in the work of the Association. During the last few years they had embarked upon two large and onerous undertakings, mainly at the instigation of two former Presidents, viz., Mr. Seth-Smith and Mr. H. T. Hare. They had moved from their old premises in Marlborough-street to new ones in Tufston-street, and they had established on a very firm footing their Day School. As they must know, those two undertakings, which had proved in both cases eminently successful, had not been taken up without a large monetary outlay, and it was only within the last few weeks that they had been able to find out exactly how much these had cost up to date. The actual cost of the building, the legal expenses, and everything

else in connexion, had been 10,211l.—an enormous amount, when they came to think of it, for the Association to have spent. A year ago they had collected the sum of 6,420l., leaving, when he came into office, about 3,790l. to be collected. They knew that a very generous friend made an offer at the beginning of the session to give 1,000l. provided that the debt was wiped off by the end of this session. Well, he was sorry to say that they had not been able to entirely do that, but notwithstanding that he had just had a letter handed to him by Mr. Hooper, their Hon. Treasurer, who said that he had seen their generous friend, who, though disappointed that the outstanding liabilities had not been entirely cleared off, had consented to convert this offer into a gift. He was not entitled to divulge the name of their friend, but he knew that the whole Association would thank that friend very deeply. That reduced the debt to 2,790l., and since they had sent out their appeals at the beginning of last October they had collected the sum of 1,631l., leaving the debt at the present day at 1,159l. He thought that that was a record to be proud of, and he felt that the Association was very much indebted to the kindness of the architectural profession for the help that had been given, and all he would say was that if those members who had not contributed anything towards the Building Fund would each, during the next fortnight, send a guinea only, the Association could almost start the next session free of debt. The Association had done a work that all were proud of. Without public or official recognition of any kind they had established themselves—starting from quite a small body some sixty years ago—in the premises in Tufston-street and with a school of architecture which he felt sure was going to do a large amount of work in the future. On the other hand there was, he thought, a slight rift in the lute, and he believed that that view was shared by other members of the Association, and it was that, in their anxiety to clear off the debt and to put the educational scheme on a sound footing, they were forgetting one of the primary objects of the Association, which, he took it, was the good fellowship and social life that should be cultivated amongst the members. They did not want the Association and its members to feel that No. 18, Tufston-street was a mere cramming establishment for the Institute examinations, and they did not want to feel, with all due deference to Mr. Maule, that the Day School was the be-all and end-all of the Association. They wanted the Association to be a sort of students' club, where they could get a warm welcome, meet other students on an equal footing, and generally help forward the social side of their work—for he thought that in every life the best friends one had were the friends made in youth. Personally, his greatest friends were those he made years ago, and if, as members of the Association they held aloof one from the other, and did not take a share in the social side of the work, he felt that all their efforts in getting the Association into its present excellent position would be nullified. Much might be done to further this end. He suggested that in the next year of his Presidency they might be able to have some social evenings and mix more one with the other than was the case now. For instance, one evening in the autumn they might have an "At Home," at which all the sketches done by the members during the summer might be exhibited and freely criticised. Another evening might be given over to students, without any President or Chairman, who could have five minutes each, say, to ventilate their grievances—and they had many, as could be seen in the "Purple Patch"! It would be an admirable thing to have some evenings like that apart from the somewhat stiff and formal general meetings. Another thing they could do was to make the premises more attractive as a club. The present appearance of the Common room—it looked indeed a "common" room—was far from satisfactory, and did not, with its few hard chairs and one or two professional building papers, attract students. They were going to improve the Common-room, and he suggested that they should take in all the foreign professional and other papers that had any bearing on their profession, and try and make the room more interesting, and a place where students could go and spend a profitable hour. Then they hoped to improve the catering. There had been one

or two complaints on this score, but he must ask members to realise that they had been one year only in the new premises, and it was very difficult to get the arrangements into working order in so short a time. Still, these were points they must devote attention to if they were to make the Association attractive to the junior members. He should like to say that he thought it a pity that he did not attend the fortnightly meetings and take part in the discussions. It was very depressing to preside over a meeting and have no one, or very few, willing to speak and he was told that the presence of the representatives of the press had something to do with that; but even if that were so he thought that some arrangement could be made with the press not to print what a speaker did not wish. They wanted healthy discussion—not prepared speeches, which had the result of taking the life out of a meeting. The Association had a great past, and it rested with the members to see that it had an equally great future. If they looked round they would find that nearly all the leading architects—the men who were doing had done the most brilliant work, and work which would last—were, or had been, members of the Association, and that was a thing which the Association ought to be proud of. Hardly a week passed without some member gaining some honour or distinction, and on either side of him he had a number of those who had won such, and only last week they had the pleasure of congratulating their friend Mr. W. A. Pite on a great success, and what he had done was what many others would do. In conclusion, the Chairman thanked the members for electing him for a second year of office, and for the Council and Secretary and others for the help they had rendered him during his occupancy of a position which was no sinecure. With the toast he coupled the name of Mr. Walter Cave.

Mr. Cave, in response, said it was a matter for congratulation that Mr. Dawber was acting as President again, and he did not think it was sufficiently well-known how much trouble Mr. Dawber had taken on behalf of the Association during his past year of office; the fact that the debt had been reduced to 1,100l. was largely due to their President's efforts. Mr. Dawber had dwelt on the social side of the work of the Association, and there was another side, which was, perhaps, of still greater importance, and that was its educational side, i.e., the schools connected with the Association. He believed there were many others who believed the same—that the work in the schools was turning out some of the best of the younger men of the day, and he felt sure that in the future they would look back to the system as being one of the most successful and one of the best arranged of the modern courses of instruction in architecture, and it was a matter on which the Association might well congratulate itself. The importance of a thorough grounding in architectural work before students entered the profession was very great, and anyone who had been under him would agree that this system of training was the secret of the proper bringing up of architects. It was satisfactory to see so many students there that evening and to think the vitality and enthusiasm of such a large body—some 1,600 of all ages. He hoped that many of them were looking forward to the prime brilliant things in their prime—for each of life, he hoped, would come to all, when each would have his life's chance. He believed that the chance came to all, though he did not make use of it always when it came, but the way for architectural students to be ready for their chance when it came was by hard work, so as to get a thorough knowledge of their profession. He supposed there was no place in the world being done as in architectural work being done as in it. At the present day, an American visitor, at the other day, on being shown London and asked his opinion of it, said, "Yes, it will be quite a nice place when finished." That was just it. London was being rebuilt, and it was to be hoped that there was work for all, and that the students of to-day would get their chance later on. Of course, as the amount of work increased so the number of students increased, and that reminded him that a friend of his told him that he did not read the daily papers but he always looked at them to see

an architect had died. It was from that point of view, i.e., preparation for the chance when it came, that he considered the Association was doing so much for students. The members in the schools had increased, and the work they were doing, as could be seen by their drawings, was of a very high order. The Association was going on on right lines, and the speaker was very success in the future.

Mr. A. O. Collard then briefly proposed the "The Visitors," coupled with the name of Mr. P. L. Forbes, who replied, remarking that he thought architects were too modest. The building might be going up, and it was generally easy to get the names of everyone connected with it except the architect.

The Chairman then proposed the last toast, "The Secretary." No one, he said, took deeper interest in the work of the Association than Mr. Driver, and no one had done more to further the educational scheme.

The toast was received with musical honours. Mr. Driver suitably replied, remarking that he was glad the Association had flourished, and that it had every prospect of continuing to do so.

The proceedings soon afterwards terminated.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the City Hall, Spring-gardens, Mr. E. A. Cornwall, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Camberwell Borough Council 1,431*l.* for formation of street; Poplar Borough Council 234*l.* for buildings at depot and gardener's range; Wandsworth Borough Council 1,250*l.* for extension of Coronation-gardens, and Greenwich Borough Council 9,287*l.* for electric lighting purposes. Sanction was also given to the following proposed loans: Paddington Borough Council 8,000*l.* for paving works, and Greenwich Borough Council 10,221*l.* for street improvement.

Notes of Theatres.—The Council resumed its debate on the annual estimates, and considered the several votes seriatim.

On the vote of 6,345*l.* for surveying theatres and music-halls.

Edward Collins complained that this was used by the Theatres and Music Halls Committee mainly for the purpose of harassing managers of places of public entertainment, and secured the reduction of the vote by 5,000*l.*

Mr. T. Brooke-Hitching seconded the amendment.

Colonel Rotten said he did not consider that the sum was too large to ensure the proper protection of the public from fire dangers.

Mr. Alington West declared it was the purest nonsense to say that they were harassing the proprietors of the theatres and music-halls. It was a significant fact that during the whole of the time the Council had had the control of places of public entertainment they had not had a single fire in a theatre.

Mr. W. Bailey said that undoubtedly in the past it was a fact that theatrical managers in London were considerably harassed by the demands of the authorities, but during the last ten years they recognised fully that there had been a wonderful improvement. However, complained of the ignorance of some of the Council's inspectors, for in his own opinion one of them insisted on an oil lamp being placed in a position where it was absolutely useless, and was never kept alight after the first week, while another inspector commanded him to shift a door-mat 16 in.

Mr. John Burns said on an average 2,000,000 people attended places of amusement in London every week, and there were about 350 of these theatres, and yet in seventeen years they had had but a fire, a personal injury, or any serious damage to licensed property.

On the amendment being put, only one vote was voted for it, and the vote was passed.

Tottenham Estate.—Upon the vote of 2,000,000*l.* on account of the housing of the working classes.

Mr. M. Beachcroft begged the Council to consider its position in regard to the Tottenham Estate, upon which it was proposed to spend 2,000,000*l.* in providing houses for the working classes. Up to the present this new estate had been a ghastly failure, only about 35 houses being occupied. The people of London could not live in the houses; even people of

Tottenham would not become tenants. Every one in the neighbourhood declared the experiment to be doomed to failure. He thought that they should cut their loss, especially as the Council were losing 1,000*l.* a year on Carington Lodging-house, notwithstanding that the Rowton House Company earned 5 per cent. and put away a good sum annually for depreciation.

Mr. W. W. Bruce, late Chairman of the Committee, said that the Tottenham Estate was a very valuable piece of building land. The Council bought it before it was ripe, but they had simply to wait, like a land speculator usually did, and allow the land to ripen, adding the interest to the ultimate capital value. So soon as the tube railway was constructed the land would become ready for development, and be worth a good deal more than they gave for it. Land all around was being built upon, and all the indications pointed to a successful development in the near future. He was bound, however, to say that municipal architects had much too expensive ideas for municipal cottages, too much being spent upon the structure of cottages which had to be let at cheap rents. He was also bound to confess that the interest and sinking fund on the capital expenditure of the estate was being charged to the rates.

Colonel Rotten objected to going on further with the Tottenham Estate. The best thing they could do was to sell the land at the enhanced value which Mr. Bruce said it now possessed.

Mr. Sears, Chairman of the Housing Committee, denied that the estate was a failure. The prospects were bright, and he hoped to bring up a satisfactory report next week in regard to it. The estimated surplus this year on the Council's housing schemes was 2,000*l.* Above all, the Council's housing policy had materially reduced the death-rate.

The estimate was adopted.

Finally the whole of the estimates, providing for a total expenditure of 4,494,500*l.*, were passed.

Proposals for provision of additional school accommodation.—The Finance Committee reported as follows:—

"The Education Committee have informed us of their intention to recommend the Council to give public notice under section 8 (1) and (2) of the Education Act, 1902, of their intention:—

(a) To provide accommodation for 1,148 children at the permanent school to be erected in Mitcham-lane instead of for 900 children as sanctioned by the Board of Education.

(b) To erect a new school for about 1,100 children upon land in possession of the Council adjoining the existing Southfield school.

(c) To acquire a site for future school requirements in the district of Southfields."

The Education Committee recommended, and it was agreed:—

(a) That the estimate of 3,241*l.*, submitted by the Finance Committee in respect of the erection of a school for mentally defective boys, at Beaufort House, Fulham, be approved.

(b) That a school for the accommodation of 80 elderly mentally defective boys be erected on the Beaufort House site (Fulham); that expenditure not exceeding 3,447*l.* be sanctioned for the purpose; and that subject to the Board of Education approving the finished plans, the work be done by Messrs. Stimpson & Co., the contractors who recently built the new school on the same site as an addition to their contract.

Rotherhithe Tunnel: Reconstruction of Railway Bridge.—The following recommendation of the Bridges Committee was agreed to:—

"That the estimate of 10,000*l.*, submitted by the Finance Committee, be approved; that expenditure on capital account not exceeding that amount be sanctioned for the reconstruction of the bridge carrying the London and Blackwall Railway over Horseferry-branch-road in connexion with the construction of Rotherhithe Tunnel; that an agreement to be prepared by the Council's solicitor be entered into with the Great Eastern Railway Company for the execution of the work under the direct supervision of the company's engineer."

Lambeth Bridge.—The following recommendation of the Committee was agreed to:—

"That no vehicles where the weight of the vehicle and the load combined is 21 tons or more shall be allowed to cross or in any way use, Lambeth Bridge; that all traffic using the bridge be required to proceed at a walking pace; and that such other restrictions be imposed upon the use of the bridge as may be considered necessary for the safety of the public."

Vauxhall Bridge.—In reply to a question, Mr. Stravs said that much better progress was now being made with the Vauxhall Bridge works.

Tramways.—The following recommendations of the Highways Committee were agreed to:—

(a) That the estimate of expenditure on capital account of 5,513*l.* (being 4,613*l.* for roadwork and platelaying, etc., and 900*l.* for overhead equipment), submitted by the Finance Committee, be approved in respect of the construction, under the powers conferred by the London County Council (Tramways and Improvements) Act, 1901, of the tramways in Archway-road, Highgate, between the Archway Tavern and the county boundary at Highgate-archway.

(b) That an agreement be entered into between the Council on the one hand and the County Council of Middlesex and the Metropolitan Electric Tramways, Limited, on the other hand, embodying the following terms:—

(i.) That the Council shall construct, at its own expense, a double line of tramways in Archway-road, Highgate, between the Archway Tavern and the county boundary at Highgate-archway, to link up with the light railways of the County Council of Middlesex at the county boundary.

(ii.) That the Council shall provide the necessary overhead equipment for the lines.

(iii.) That the tramways shall be leased by the Council to the Metropolitan Electric Tramways, Limited, with the consent of the County Council of Middlesex, for a period of three years.

(iv.) That the lessees shall covenant to repair and maintain, and if necessary to renew, the lines and overhead equipment to the satisfaction of the Council.

(v.) That the rent to be paid to the Council in respect of the tramways shall be at the rate of 1,500*l.* for the first year, 2,000*l.* for the second year, and 2,500*l.* for the third year.

(vi.) That the plying of the tramway tracks shall be of such a material as may be agreed upon between the Council and the County Council of Middlesex.

(vii.) That the rolling-stock and the electrical power necessary for working the tramways shall be provided by the Metropolitan Electric Tramways, Limited.

(c) That the Highways Committee do settle the precise terms of the agreement referred to in the foregoing resolution, so far as it affects the Council; and that the seal of the Council be affixed thereto when ready."

Brixton Station and Herne Hill Sub-station.—The Fire Brigade Committee reported as follows:—

"The Council, on April 13, 1905, decided that, in the event of the Works Committee being prepared to undertake the work at the amount of the architect's estimates, the work of erecting the new fire-station at Brixton, in substitution for the existing station in Ferndale-road, and the Herne Hill sub-station, should be executed by the Council without the intervention of a contractor. The Works Committee have now agreed to undertake the work in each case, at the amount of the architect's estimates—viz., 11,250*l.* and 7,752*l.* respectively."

Cannon-street Fire-station.—It was also agreed that the freehold of No. 32, Cannon-street and No. 86, Queen Victoria-street be acquired for 15,850*l.*; that the payment of 108*l.* 18*s.* 5*d.*, the muniere's fees, be agreed to.

Having transacted other business, the Council adjourned.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Strand.—The rebuilding of the Quadrant, Regent-street, with the front portions of the upper floor of the proposed buildings carried over the entrances to Air-street on either side of Regent-street (Mr. R. Norman Shaw, R.A. for Mr. J. F. E. Horner, a Commissioner of His Majesty's Woods and Forests).—Consent.

Walworth.—Buildings upon the site of Nos. 75, 77, 79, 81, and 83, Westmoreland-road, Walworth, abutting also upon Doctor-street and Portland-street (Messrs. Cluttons for the Ecclesiastical Commissioners and Lord Llangatock).—Consent.

Wandsworth.—That an order be issued to Messrs. Holloway Brothers sanctioning the formation or laying-out of new streets for carriage traffic on the Magdalen Park estate to lead out of Gerrard-lane and Burntwood-lane, Wandsworth.—Agreed.

Lines of Frontage and Projections.

Paddington, North.—Retention of projecting porches, balconies, and bay-windows at Delaware Mansions, Delaware-road, Elgin-avenue, Paddington (Mr. W. A. Rabson for Mr. W. F. Cave).—Consent.

Wandsworth.—A building on the eastern side of Rostella-road, Wandsworth, to abut also upon the western side of Thurst-road (Mr. A. Dean).—Consent.

Hammersmith.—Buildings on the site of Nos. 155 and 158, Uxbridge-road, Hammersmith (Mr. E. J. Clayton).—Consent.

Hammersmith.—That the Council do make no order on the further application of Mr. A. W. Davies & Co., on behalf of Messrs. Levy & Co., for the consent to the erection of a projecting illuminated sign at No. 22a, King-street, Hammersmith.—Agreed.

Camberwell, North.—A house on the north side of Calais-street, Camberwell, to abut also upon the east side of Halsemere-road (Mr. P. Arundell).—Refused.

Clapham.—A one-story building at the rear of No. 253, Lavender-hill, Clapham, to abut upon Altenburgh-gardens (Mr. E. Evans).—Refused.

Paddington, North.—One-story shops in front of Nos. 435 and 437, Edgware-road,

Paddington (Messrs. Gardiner & Theobald for Meux's Brewery Company, Ltd.).—Refused.

Paddington, North.—One-story shops in front of Nos. 439 to 451 (odd numbers only), Edgware-road, to abut also upon Maida-hill West (Messrs. Boehmer & Gibbs for Mr. W. Hirsch).—Refused.

Paddington, North.—One-story shops in front of Nos. 431 and 433, Edgware-road, Paddington, with external walls at less than the prescribed distance from the centre of the roadway of Crompton-street (Messrs. Gardiner & Theobald for Messrs. Matthews & Son, Ltd.).—Refused.

Line of Frontage and Construction.

Paddington, North.—A shed at No. 1, Clifton-road, Paddington, to abut upon Maida-vale (Messrs. Parfitt & Co. for the Express Dairy Company, Ltd.).—Refused.

Deviation from Certified Plans.

Strand.—Deviations from the plan certified by the District Surveyor, so far as relates to the proposed rebuilding of No. 32, Rupert-street, and No. 6, Upper Rupert-street, St. James (Mr. R. H. Kerr for Mr. Neve).—Consent.

St. George, Hanover-square.—A modification of the provisions of section 41 of the Act, so far as relates to the proposed erection upon the site of Nos. 23 and 24, Bolton-street, of an addition to the Curzon Hotel, Curzon-street, Mayfair (Mr. S. Harwath).—Consent.

Space at Rear.

Poplar.—An additional story to the Wesleyan Seamen's Mission Building, Jeremiah-street, East India Dock-road (Messrs. Gordon & Gunton for the trustees of the Seamen's Mission).—Consent.

Addition to Building.

Paddington, South.—The erection on the site of Nos. 3, 5, 7, 9, and 10, Leinster-yard, Hereford-road, Baywater, of an addition to Nos. 129 and 131, Westbourne-grove, and Nos. 2, 4, and 5, Chepstow-place (Mr. E. J. Stubbs for Messrs. Bradley & Sons).—Consent.

The recommendations marked † are contrary to the views of the local authority.

ARCHITECTURAL SOCIETIES.

THE EDINBURGH ARCHITECTURAL ASSOCIATION.—The members of the Edinburgh Architectural Association paid a visit on Saturday last to Dundee. The chief buildings on the programme were the Town House, Old Custom House, Royal Bank Buildings, St. Paul's Episcopal Church, and the steeple of St. Mary's Tower. The new offices of the Dundee Courier were also visited, and the "ferro-concrete" basement and pile foundations of this building excited much interest. In the afternoon the party was entertained to tea by Mr. P. H. Thoms, President of the Dundee Institute, and at the conclusion of the visit the members dined together.

ARCHITECTURAL ASSOCIATION CAMERA AND CYCLING CLUB.—An excursion to Belgium has been arranged, leaving Charing-cross station on Friday, June 9, by the 9.0 p.m. train, arriving at Bruges 4.3 a.m. The headquarters will be at the Hotel Windsor, Bruges. A visit to Ypres, *via* Thourout, will be made on the Sunday. All members of the Architectural Association and their friends (ladies and gentlemen) will be welcomed. Further particulars can be obtained from the Hon. Secretary, Mr. Gilbert H. Lovegrove.

ARCHÆOLOGICAL SOCIETIES.

BIRMINGHAM ARCHÆOLOGICAL SOCIETY.—This Society visited Wootton Wawen on the 20th inst., when nearly 200 ladies and gentlemen travelled in a special train of saloon carriages to Henley-in-Arden. Carriages were then taken to the old parish church of Wootton Wawen, where the Rev. F. T. Bramston (vicar) pointed out some of the interesting features of the building. Dating back to the period of the Saxon heptarchy, the church has passed through many vicissitudes, and each succeeding century has added something to the fabric. Some of the additions and alterations have seriously interfered with the symmetry of the structure, but they afford a rare opportunity of tracing the development of English architecture. The church contains examples of Saxon, Norman, Early English, and XIVth and XVth century work. The centre of interest is the Saxon tower with its four massive square pillars and remarkably small round arches. The original structure is almost surrounded by later additions. On the east side is a XIVth century chancel, and the south aisle

has also been extended eastwards to form a chantry chapel. Here a stone slab marks the burial-place of William Somerville, the poet who wrote "The Chase." The church also contains some fine monuments to the Smythes, Harwells, and Carringtons of Wootton Wawen Hall. Their historic mansion is within a stone's throw of the church. The house is a very handsome and commodious one in the Italian style, and it stands upon an extensive and picturesque estate. Lord Francis Carrington rebuilt the hall in 1687. Tradition says that Sir Christopher Wren prepared the plans, and there is good reason for believing that Grinling Gibbons was responsible for the beautiful carving of the cornices. It is certain that Wren and Gibbons were concerned together in similar work at Arbury, and that Sir Christopher was living in Warwickshire when the building was commenced, though he did not buy Wroxall till 1713. The Wren family remained for 150 years at Wroxall, which is six miles above Wootton Wawen on the stream that flows past the hall into the River Aine. The present owner of the hall has spent a great deal of money in restoring the fabric, renovating the interior and improving the estate. Mr. and Mrs. Capewell Hughes received their guests in the entrance hall, which has been used as a drawing-room for the last hundred years, but has now been restored to its original form, and adorned with beautiful frescoes depicting scenes from Shakespeare's "Much Ado About Nothing," by Mr. F. W. Davis, a former student of the Birmingham School of Art. Under the direction of Mr. John Humphries, the organiser of the Society's excursions, the party passed through the drawing-room, which is rich in tapestries, to the mezzoint galleries, where they had a glimpse of the study, in the oldest portion of the house, which contains several secret escape-ments. The house has been in Roman Catholic hands from the time of the Reformation, and there remains abundant evidence of its adaptation for concealing priests in times of persecution. After admiring the oak panelling, carved with the Carrington crest, in the morning-room, the archaeologists ascended the staircase, at the top of which they noted the entrance to the priests' apartments. Descending to the kitchens, traces of another chapel were pointed out. Below this they came to the old well, the crypt cellar, and the subterranean passage, which is said to branch into two, one outlet being near the church and the other in the village. It is a well-preserved brick tunnel, but is flooded with rain-water. Passing through the billiard-room, the visitors saw the minstrel gallery, and in the dining-room they noticed the frames of family pews, indicating that this room was used as a private chapel a hundred years ago. In the music-room Sir Benjamin Stone delivered a short address, and referred to the hall as one of the most interesting country seats in Warwickshire. The history of the hall was, he said, intimately associated with that of the parish church and the ruined priory that could still be traced on the estate. Probably both ecclesiastical buildings grew out of a hermit's cell established by a missionary from one of the older monasteries on the Continent. The history of the priory could be traced back to the year 850, when it received a grant from Ethelbald, King of Mercia. Mr. J. A. Cossins (President of the Society) expressed the hearty thanks of the company to their host and hostess. He also referred to the fact that the excursion was the hundredth in the annals of the Society, and the first of the present season. After tea the visitors strolled through the walled garden. Shortly after seven o'clock the archaeologists returned to Birmingham.—*Birmingham Post*.

COURT OF COMMON COUNCIL.

THE usual fortnightly meeting of the Court of Common Council was held at the Guildhall on Thursday last week, the Lord Mayor presiding.

Street Improvements.—On the recommendation of the Improvements and Finance Committee it was decided not to effect improvements in connexion with the pulling down of the undermentioned premises, Nos. 143, 144, and 150, Fleet-street; Nos. 58 to 61, Fetter-lane, and Bartlett's passage; No. 21, Thavies-inn; Church Entry, Carter-lane; No. 66, Farringdon-street; and No. 91, Minories. On the recommendation of the Streets Committee, it was agreed to carry out certain paving works at the corner of Gresham-street and Prince-street, at a cost of 500*l*.

No. 17, Fleet-street.—The Lord Mayor laid before the Court a letter from Messrs. Barclay

& Co., Ltd., relative to the premises, No. 17, Fleet-street, protesting, now that the premises had been entirely demolished, at its re-erection on its former site. After a short discussion the matter was referred to the City Lands Committee.

The Proposed Thames Barrage.—On the recommendation of the Special Committee of the Port of London, it was agreed to make a representation to the Government in favour of the appointment by a Commission or Departmental Committee to inquire into the proposal to construct a barrage across the Thames at Gravesend.

Having transacted other business, the Court adjourned.

WESTMINSTER CITY COUNCIL.

THE usual fortnightly meeting of this Council was held on Thursday last week at the City Hall, Charing Cross-road.

Alderman Everett presented a petition, signed by 243 tradesmen and residents in the St. John's ward, urging the Council to use their influence with the London County Council for the purpose of preventing any further evictions under the Millbank Improvement Scheme until the land is required or before some definite scheme is submitted. The petition was received and referred to the Housing Committee.

Lady Sanitary Inspector.—A letter was received from the Local Government Board sanctioning the appointment of Mrs C. W. Byrne as a sanitary inspector under the Council.

Fixing of Flushing Hydrants.—On the recommendation of the Highways Committee it was agreed to fix 100 flushing hydrants at various points in the City, at an estimated cost of 20*l*. per hydrant.

The Coliseum "Sky-sign."—The Law and Parliamentary Committee reported having communicated with the London County Council in regard to the revolving sign on the tower of the Coliseum, and having received a reply from that authority that neither the tower nor the revolving sign was showing on any of the plans of the premises in question which were approved by them, the Committee reported that, under the circumstances, they had given directions for notice to be served on the London Coliseum, Ltd., to remove the sign, and that, failing compliance with that notice, they should take legal proceedings for the removal of the structure, the proceedings for the removal of the structure, the Committee reported that, under the circumstances, they had given directions for notice to be served on the London Coliseum, Ltd., to remove the sign, and that, failing compliance with that notice, they should take legal proceedings for the removal of the structure, the Committee reported that, under the circumstances, they had given directions for notice to be served on the London Coliseum, Ltd., to remove the sign, and that, failing compliance with that notice, they should take legal proceedings for the removal of the structure.

London Squares and Enclosures (Improvement) Bill.—The same Committee reported having received communications from the London County Council, asking the City Council, in view of the fact that they were now the only petitioners against the Bill, whether they would withdraw their petition against the measure. Having regard to the fact that the Council were strongly of opinion that, if the places were scheduled in the Bill were taken over as open spaces, the duty and expense of maintaining them should devolve upon the council of the ward in which they were situated, the Committee stated that they had informed the London County Council that they could not see their way to withdrawing their petition. The action of the Committee was approved.

"Midget" Arc Lamps for the Palace.—The Works Committee reported having given instructions for the placing of "Midget" arc lamps in various parts of the Palace of St. James, Hanover-square. The Western Electric Supply Company, who recently placed one of the lamps, as an experiment, at the Palace, had made an offer to supply the Council to supply and maintain lamps of this type at the rate of 7*l*. 10*s*. per annum.

The Paving of Great Smith-street.—The same Committee reported that they had informed Messrs. Hollams, Sons, & Co., who had written to them on behalf of the Paving and Paving Company in regard to the payment that firm and the Council as to the payment for certain paving works in Great Smith-street, that, under the terms of the contract, the City Engineer was the sole arbitrator, and that arrangements were being made for a day to hear and determine the matter.

Proposed New Street.—On the recommendation of the Committee, the Council agreed to sanction the closing of a portion of Backingham Cottages in connexion with the formation of a new street from Francis-street to Coburg-row.

Supply of Granite.—The Committee further reported that they had agreed to purchase from the Guardians of St. George's Union 100 tons of 24-in. broken Gurnsey granite for the maintenance of Paving Board Pavement. It was agreed, on the recommendation of the Committee, that, in cases where the

consent to the fixing of pavement
such consent shall be subject to a con-
that the lights and surrounding kerbs
be kept in repair by the owner.

Correspondence.

URGENT, ETC., R.I.B.A. ELECTIONS.
SIR.—At this juncture, to judge by the flood
of circulars and letters which are appearing,
the profession seem in danger of losing their
sense of proportion over the proposed list of
members to constitute the new Council of the
R.I.B.A.
No vote should be given on the mere in-
formation for a particular form defining our
present status, but, rather, for that man who
approved by his executed works or other
evidence (1) that he is an artist; (2) that he is
an architect; (3) that he is a good man of
business; and (4) that he can and will give
his necessary time to the work.
If the Institute is to be rushed just now—of
which indications are not wanting—it will
suffer the greatest blow ever struck in these
times as the oldest and first among the fine arts.
PHILIP A. ROBSON.

RE FELLOWSHIP, R.I.B.A.
SIR.—I notice that, in the current Supple-
ment of the Journal of the R.I.B.A., there is
a long string of names proposed for election
to the Fellowship without previously having
undergone the examination. In the same Supple-
ment is the announcement that the Summer
examinations are to be held on a certain date.
On the one hand, men are being elected in
enclaves, so to speak, without any justification
whatever; and, on the other hand, the Council
are inviting young men to take three examina-
tions, at much trouble and expense, only to
be told at the end of it. This position of affairs
must be abolished, and the examination
should be abolished, and election take
place in the old-fashioned way, or the whole of
the members should qualify for membership
by passing the examination, exception only
being made in the case of very distinguished
men.
It appears to be the easiest thing in the
world to get the necessary proposers for election
to Fellowship. Indeed, two architects
have recently proposed who had failed at the
intermediate examination, neither of them
making a further attempt. In other words, the
Institute refused to enrol them as students of
the Institute. Having, in the meantime, been
in practice seven years, they now found
members of the Council to nominate them for
Fellowship of that Institute to which they were
refused admission as students but a few years
ago. It seems quite incredible, but these are
the facts.
The first thing the newly-elected Council
should do is to put a curb on this multitude of
proposers. If they are indifferent, I
think there is a sufficiently strong body of
opinion in the country in favour of some such
action to enable us to arrive at the same end
in another way.
T. DENTON BROOKS.

R.I.B.A. STUDENTS.
SIR.—In your issue of May 13 appears a
letter from "Student, R.I.B.A." which may
begeth astonish the younger members of the
Institution, and ought not to pass unnoticed.
The many new members of the R.I.B.A.
are elected without any test whatever, what
order that one does hear of students whose
work for real hard work is damped thereby?
The letter referred to is liable to give other
students a very exaggerated idea of the amount
of work necessary for preparation for the In-
termediate examinations. Surely there are not

many students who find it necessary after
working for the Intermediate examination, to
"take a rest for a year or two," or even to
"take a continental tour," and students, as a
rule, do not drift into "a budding practice"
opinion, the fact that a large number of
students remain on the register without pro-
ceeding to the Final examination is due, in great
measure, to the lack of enthusiasm and that
necessary love of real hard work on the part of
the students themselves. I would commend to
students' consideration the following facts:—
(1) That it is possible for a man of average
ability to prepare for, and be successful at, the
Intermediate examination by twelve months' hard
work after office hours.
(2) That the same man can prepare for, and
be successful at, the Final examination two
years after passing the Intermediate. If he
works, say, eight hours for his principal, it will
be necessary for him to work on an average
an extra five hours per day for eighteen months
previous to the Final on examination work,
and the necessary evidences of study.
Therefore, I am of the opinion that the most
excellent three-stage examination, as at pre-
sent established is far better than the two-
stage examination suggested by "Student,"
and that the amount of time necessary for pre-
paration does not put the test beyond the
reach of any man of ordinary ability.
N. C., Assoc. R.I.B.A.


CONCRETE PUGGING FOR FLOORS.
SIR.—I am very interested in the letter of
your correspondents, Messrs. Holman & Good-
rham, with reference to the suggestion as to the
pugging between joists of floor. I am not so
certain that it is common knowledge that the
placing of wet concrete between wooden joists
of floor is a dangerous practice. It all depends
upon whether the joists are of sound timber
or sappy, and the time this practice has been
in vogue is too short to enable us to speak
definitely.
From the experience already obtained by
the British Fire Prevention Committee I am
at present distinctly of opinion that the pro-
posed method of dry slabs supported by angle-
iron is not a fire-resisting floor, for this reason—
that the fire creeping up the sides of the joists
would melt the angle-iron and spikes red hot,
which would cause it to fall away from the
joists, and down would come the slabs of con-
crete on the heads of the unfortunate firemen
who, perhaps, might be beneath.
The proof of the pudding is in the eating,
and I will make an offer to Messrs. Holman &
Goodrham, that we, of the British Fire Pre-
vention Committee, will give them the use of a
hut, 20 ft. by 10 ft., provide the fuel and other
plant complete, for a test at our testing-
station, if they will provide and fix complete a
floor on exactly the same lines as that erected
by them at Darnley-road, Mare-street,
Hackney.
ELLIS MARSLAND,
Hon. Sec. British Fire Prevention
Committee.
1, Waterloo-place,
Pall Mall, S.W.

SM.—The letter in last week's *Builder*,
p. 543, on this subject from Messrs. Holman &
Goodrham, architects, refers to a block of
buildings at the corner of Mare-street and
Darnley-road, Hackney, which is in my district
as District Surveyor, and I think it right to
state that the floor, as executed, was not wholly
approved by myself, as District Surveyor, or
by the District Surveyors' Association, who
several times discussed the matter.
The objection to the floor as shown was that,
in a serious fire, the lower part of the wooden
joists would probably be destroyed by the fire,
which would extend to the iron supports of the
blocks, cause them to drop out, and the blocks
with them. There was some correspondence
with the London County Council about the
matter, at the request of the architects, and
the suggestion was made through the Superin-
tending Architect "that the fillets should be in
the centre of the thickness of the blocks in-
stead of flush with the underside, the blocks
being slid into position and the last one cast
in situ." This would have met the objection
named above, and both the builder and the
architects were at once informed of it; but it
was not carried out, and, as there is at pre-
sent no specific rule about the pugging, the
Council were not prepared to give evidence
in the Law Courts in support of their sug-
gestion; meanwhile, the proposed fire-resisting
clauses of the London Building Act (Amend-
ment), 1905, were published, requiring the sup-
ports to the pugging to be secured to the sides
of the joists in a central position in the depth
of the concrete, and as this was just what had
been asked for in this case, the matter was

brought before the District Surveyors' Asso-
ciation again, who came to the conclusion (with
which I agreed) that it was not desirable to
take the case to the Law Courts till definite
rules had been enacted; and hence I think it
most important in the new fire-resisting clauses
that there should be definite rules on this point,
and that those put down by the Council would
be most valuable in this case for the prevention
of danger in a serious fire.
With regard to the difficulty named by
Messrs. Holman & Goodrham about the danger
of dry rot in a floor of this description, I
think this may occur whether concrete is
pugged in or put in in blocks and grouted in;
and for this reason it is my opinion, and that
of many district surveyors, that wooden joists
should not be allowed at all in a fire-resisting
floor in a new building, but only as a tempo-
rary measure in an old building where the
joists are already there and could not be re-
moved without great expense to the owner;
and this was amongst the suggestions of the
District Surveyors' Association, in notes pre-
pared at the request of the London County
Council in connexion with the proposed
Amendment Bill of 1903.
ALEXANDER PAYNE,
Architect and District Surveyor.

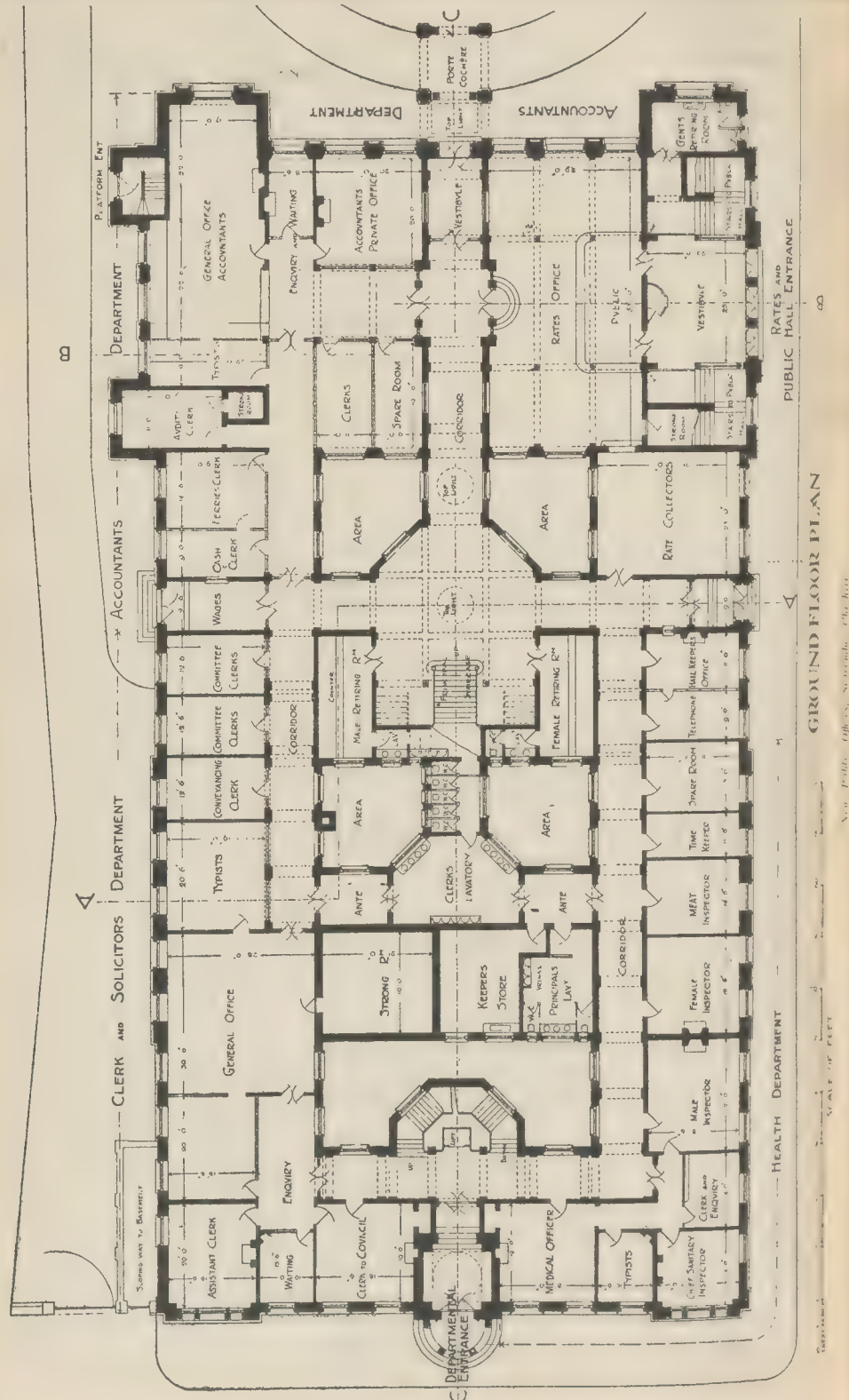
Illustrations.

KING'S COLLEGE HOSPITAL.

 We publish to-day the plan of the new
hospital, and a perspective view
of the administration and nursing
block which is to be built on a site
of twelve acres situate on Denmark-hill, from
the designs of Messrs. W. A. Pitt and R. S. Balfour.
The plan requires some explanation, due to
the inequality of the site. The hospital is to
accommodate 600 beds.
The vertical axis of the hospital is from north
to south, and the disposition of the buildings
is consequent on the contour of the site, which
rises rapidly towards the south. The first floor
of the administration building is on the level
of the ground floor of the ward blocks. On
this floor, and occupying the central position
of the site, is accommodated the nursing direc-
tion of the whole institution. Also from this
central position the administration of the sick
wards, the nurses' home, and the general
superintendence radiates.
At the head of this official section (which is in
close and direct communication with the
secretarial department below) is found the
grand staircase, which rises from the ground floor
of the front block to the top floor of the hospital.
A central position is provided for the chapel,
which is placed on the same level as the nursing
direction. Still carrying out the central idea,
the Post-office and telephone room have been
placed in the eye of the institution. Adjacent,
and in the same central position, is a waiting-
room for the friends of patients awaiting intelli-
gence, with a doctors' room in connexion
therewith. A servants' staircase completes
this central scheme.
The same central and radial principle has
been applied to the kitchen and stores depart-
ments, which are below the same centre with
dual diet lifts serving to both sides of the
hospital. The linen department is likewise
placed in the same relation to the whole,
being below the chapel, with direct access to
all parts of the hospital and the laundry block.
In arranging the housing of the nurses as
to present and future requirements, the resident
medical officers' apartments, and the servants'
quarters, particular attention has been given
to ensure that, while being provided in the same
block, they are self-contained and do not inter-
communicate with each other.
As has been indicated, the design is based
on a principle of centralisation and radiation in
all departments. This principle will be readily
admitted to be of first-rate importance, and
absolutely essential to secure economical,
effective, and efficient hospital administration.

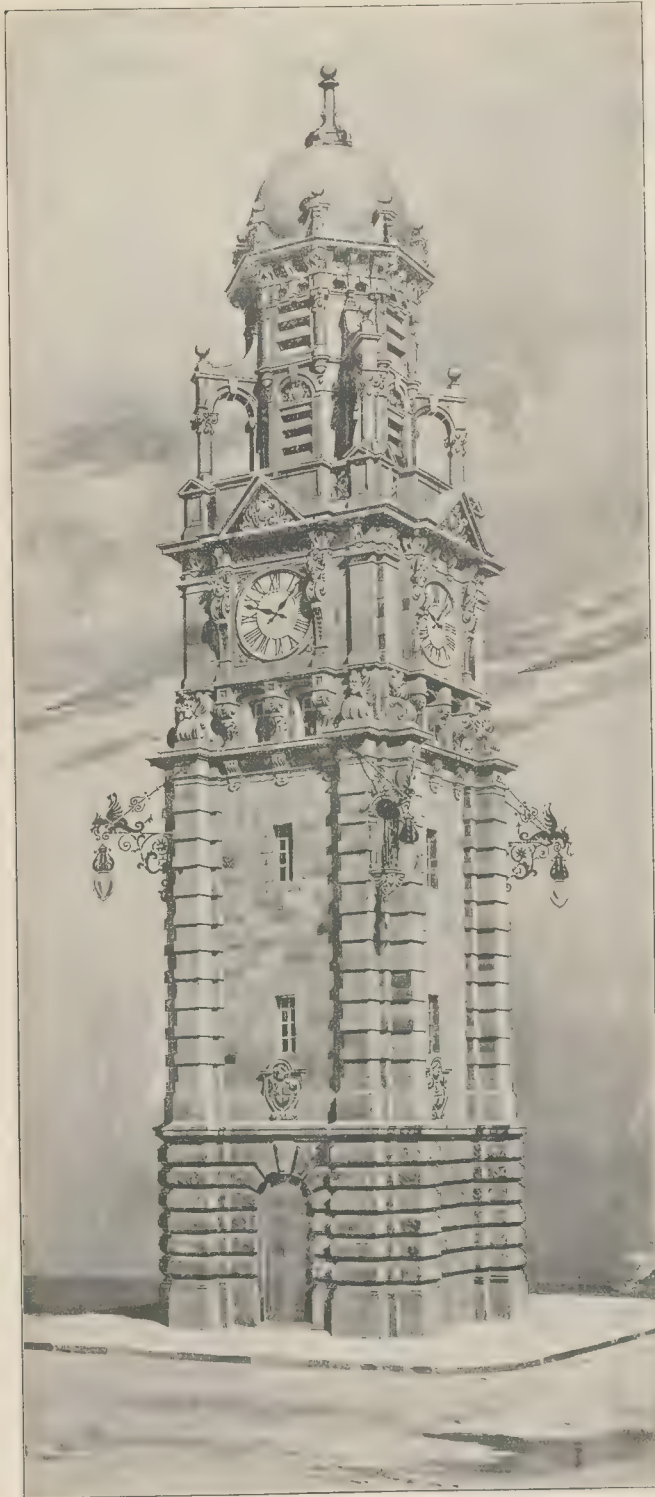
NEW PUBLIC OFFICES, SEACOMBE,
CHESHIRE.

We publish the design by Messrs. Briggs and
Wolstenholme and Arnold Thornely to which
the first premium was awarded in the recent
competition for new Public Offices for the
Seacombe and Wallasey District, Cheshire. It
was, if we remember right, called "Wallasey"
in the earlier announcement of the competition;
but this is the same building.





New Public Offices, Seacombe, Cheshire.



Proposed Clock Tower, St. George's-circus: Perspective View.

We give the perspective view, and plans to a pretty large scale of the two principal floors, the arrangement of which explains itself.

PROPOSED CLOCK TOWER, ST. GEORGE'S CIRCUS, S.E.

We give the sheet of elevations, plans, and sections of the design by Mr. Jan F. Groll, which received the first premium in the recent competition for a clock tower to be erected at St. George's-circus; and add also a reproduction from the architect's perspective sketch.

By the terms of the competition the total cost of the building, exclusive of the clock, was not to exceed 1,700*l.*; the height not to exceed 50 ft. above the street level, and means to be provided for access to the roof.

The description of the work is fully given in the memoranda on the drawing.

BOOKS RECEIVED

LYNTON AND LYNNMOUTH. (The Homeland Association. 6d.)

TENTH ABSTRACT OF LABOUR STATISTICS OF THE UNITED KINGDOM: 1902-1904. (Wynman & Sons. 1*s.* 2*d.*)

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE-STEEL.—XXI.

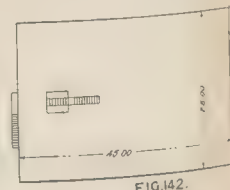
TWO COIGNET SYSTEM STOREHOUSES NEAR PARIS.

VISITORS to Paris who have been led by archaeological tastes to the ancient town of St. Denis, or have yielded to the inducements offered by Asnières and Argenteuil in the way of rowing or sailing on the River Seine, may have noticed the low-lying peninsular situated between the three places mentioned. This somewhat dreary area, known as the Plaine de Gennevilliers, is protected against inundation by an embankment along the river side, and is chiefly occupied by market gardens fertilised by the liquid conveyed from the main drainage system of Paris by the *collecteur général d'Amiens*.

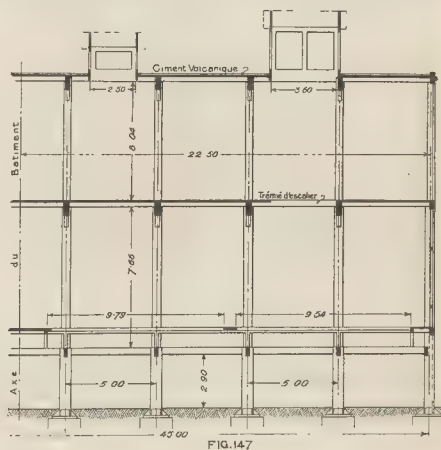
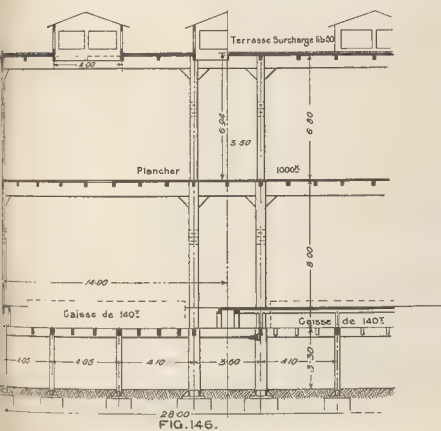
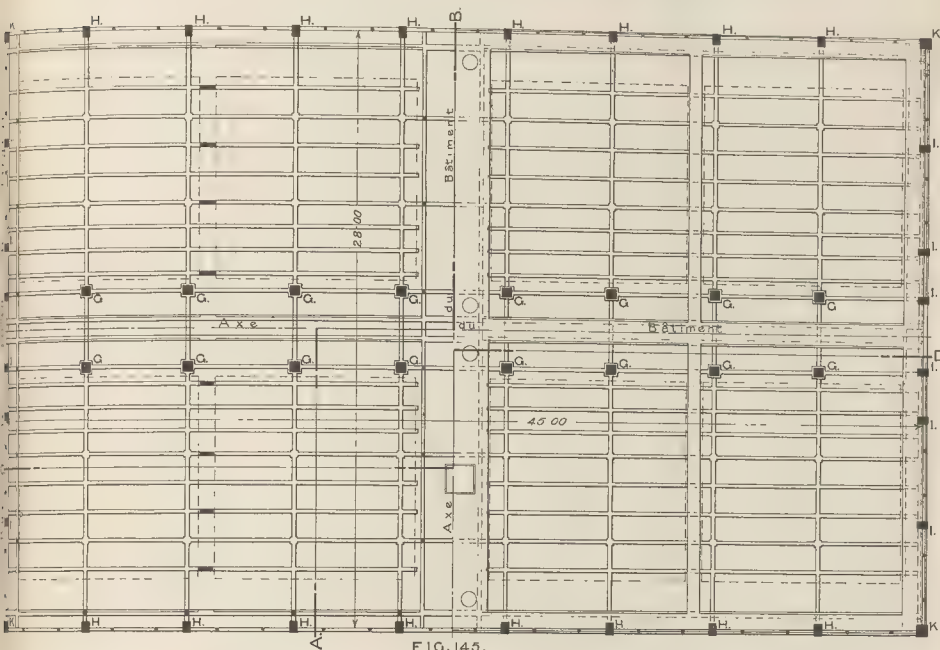
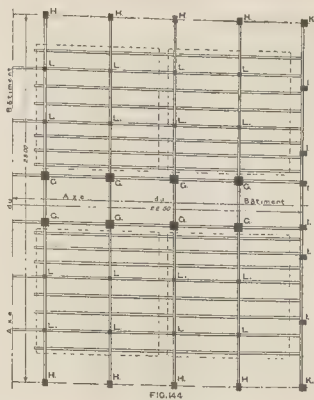
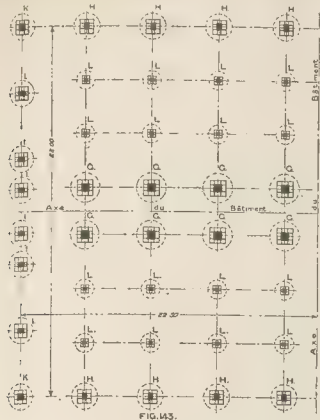
Near the bank of the Seine on the northern boundary of the plain, a large industrial works is now in course of construction by the Société d'Éclairage, Chauffage, et Force Motrice de Gennevilliers. The object of this company is to supply gas for purposes of light, heat, and power to all the towns and villages in the surrounding district, and when finally completed the works will include gas-producing plants, several large gasometers, and storehouses for coal and other materials. A wharf on the river front serves for the discharge of coal brought up the river in lighters, and from the wharf a concrete-steel viaduct has been built to support the railway lines laid down for the transportation of materials to the storage depôts.

In the present article we propose to deal with the construction of two large storehouses which, with the exception of the brick panels between the wall framework, are built entirely of concrete-steel on the Coignet system, which was selected after due consideration by M. Stinville, the engineer by whom the general plans of the building were prepared. The details of the armoured concrete construction were designed by M. E. Coignet, M. Soc. Ing. Civ. de France, and the works were executed by MM. Edmond Coignet et Cie, of Paris.

Fig. 142 is a plan showing the general



dimensions of one of these two buildings. Each of the buildings is 45 metres long by 20 metres wide, and between them is a roadway 20 metres, this being occupied by a roadway.



As the storehouses are identical in dimensions and construction, we need only deal with one of them in the following description.

The building comprises a basement and two upper floors, 4·40 metres and 11·30 metres above ground level respectively, and a flat roof 18·10 metres above the same datum. It should be noted that, although the outer walls are partly of brick, the entire weight of the structure is carried by the concrete-steel columns and transmitted by them directly to the foundations.

Fig. 143 is a half-plan of the foundations, from which it will be seen that the entire building is supported by eighty columns of five different types, lettered G H I K L, for the purpose of ready identification. Each column is supported on a cast-iron base plate, and this in turn by a concrete pier of cylindrical form carried down to a sufficient depth into the earth to insure stability, the top surface of the pier being 50 centimetres below ground level.

There are four columns of the type K, one at each corner of the building, and for this type the concrete pier has the diameter of 2 metres. The cast-iron base measures 1·05 metres square at the bottom, 50 centimetres square at the top, and 40 centimetres high. The base plate is stiffened by eight ribs rising from the bottom plate to the top, where suitable provision is made for supporting the longitudinal reinforcement of the column, which measures 50 centimetres square.

Along the front and back walls of the structure all the remaining columns are of type H, there being eight of these between the corner columns at the ends of the façades, or, including the latter, ten columns in each wall. The foundation-piers are of 2 metres diameter, the same as for the type K columns. The cast-iron base also measures 1·05 metres square at the bottom, but at the top the dimensions are 50 centimetres by 35 centimetres, to correspond with the transverse dimensions of the column.

Along each end wall of the storehouse there are six columns of type I, measuring 50 centimetres by 35 centimetres, making, with those of type K, eight columns in each wall. The cylinder foundations and the cast-iron bases are of the same dimensions as for the columns of type H.

On either side of the longitudinal axis of the building there is a row of eight columns, type G, in addition to two type I columns, making ten columns in each row. The foundation-piers for the interior columns are of 2 metres diameter, and the cast-iron bases measure 1·20 metres square and 60 centimetres square at the bottom and top respectively, the columns themselves having a sectional area of 60 centimetres square.

The other interior columns are those of type L, which are of much smaller dimensions, being intended simply for the intermediate support of beams situated at 1·10 metres below the level of the first floor. The cylinder piers for the columns are 1·40 metres in diameter, the cast-iron bases 80 centimetres square at the bottom, while the columns themselves measure 25 centimetres square.

The columns generally are disposed in rows 5 metres apart centre to centre, measured along the main axis of the building, but the spacing of the columns in the transverse rows is not uniform. At each end wall two of the I type columns are spaced 3·35 metres apart, one on either side of the centre line, then comes another column at a distance of 2·325 metres, and finally come two outer columns at intervals of 5 metres. The columns in each of the other rows are spaced on either side of the centre line as follows:—(1) Centre to column G, 1·80 metres; (2) column G to column I, 4·10 metres; (3) column I to column L, 4·05 metres; (4) column L to column H, 4·05 metres. The reason for the arrangement of the columns in the manner indicated is to provide for supporting a series of eight storage tanks, each measuring 9·44 metres square by 1·30 metres deep, and weighing 140 tonnes, including the contents. These tanks are carried upon a system of main and secondary beams, the ends of the main beams being supported by the outer columns of types H, I, and K in the front, back, and end walls, and by the columns of type G on either side of the centre line of the building, while intermediate support is afforded by the columns of type L.

Fig. 144 is a half-plan of the beam system, which, as we shall explain more fully a little later, does not constitute any part of the first floor proper.

Referring to this drawing, the main beams extending from front to back of the building are supported by the rows of columns, and the spacing between each beam is consequently 5·00 metres, centre to centre. All these beams are of concrete-steel and measure 16 centimetres wide by 45 centimetres deep.

Below the areas covered by the tanks, and along the lines of columns G, these beams are connected by secondary beams with a cross-section measuring 16 centimetres wide by 40 centimetres deep. On either side of the longitudinal axis of the building the secondary beams are spaced as follows:—(1) From axis to line of columns G, 1·80 metres; (2) from line G to first beam, 0·80 metres; (3) the next three beams are spaced 1·10 metres apart; (4) the next four beams are spaced 1·35 metres apart; (5) from the last beam to centre line of columns H the spacing is 2·70 metres.

The positions of the four tanks in one-half of the building are indicated in Fig. 144 by broken lines. Inspection will show that there are ample spaces between the tanks themselves, as well as between them and the ends and sides of the building. These spaces are occupied, as shown in Fig. 145, by the first floor, which consists of beams and a floor slab supported along the outer edges by the columns H, K, and I, and elsewhere by dwarf columns built up from the beams upon which the tanks are placed. In this plan the outer brick walls are indicated, together with the 15-centimetre square concrete-steel stanchions which, together with the main columns and horizontal members in this and the upper story, constitute a complete skeleton framing for the entire building.

For supporting the floor, beams 16 centimetres wide by 42 centimetres deep are carried along the front, back, and end walls between the columns. Then, at a distance of 1·03 metres from these beams, there is a line of dwarf columns, with a section of 25 centimetres by 15 centimetres, parallel with the front and back walls, each of these members being built up from one of the main beams supporting the tanks; and parallel with the end walls there are four rows of dwarf columns with the cross-section of 15 centimetres square and an average spacing of about 4 metres in each row, built up from the secondary beams below the tanks. These four rows are situated one near each end of the building and one at each side of the transverse centre line.

Upon the dwarf columns are beams 25 centimetres wide by 17 centimetres deep, for a concrete-steel floor slab 6 centimetres thick, which extends over the two parallel series of beams, forming a continuous platform round the building. The front or inner edge of the platform is rebated for the addition of wood flooring up to the tanks. The three transverse gangways between the tanks, two 65 centimetres wide and one 3·50 metres wide, consist of concrete-steel floor slabs 12 centimetres thick with suitable support from below, but the longitudinal gangway extending from end to end of the building is floored with concrete-steel only in the centre, for a width of 1 metre, the remainder of the floor up to the tanks on either side being of timber.

Fig. 146 is a part cross-section of the building, and Fig. 147 a half-longitudinal section. These drawings will serve the purpose of further explaining the details of construction.

From the particulars stated above, it will be seen that the first floor is really a platform pierced by eight openings in each of which is a large shallow tank, partially sunk below the floor level, above which the upper part of each tank projects to a height of 40 centimetres.

The dimensions given for the main columns in the walls of the building, and for the interior columns only apply so far as concerns those portions of their length extending up to the beams of the system upon which the tanks are erected.

Above that height the type G columns are reduced in sectional area to 50 centimetres square proportionately with the reduced load to be carried, and none of the type L columns are continued above the same level since the only reason for their employment was to afford intermediate support for the members beneath the eight tanks.

The height of the first story of the building from floor to floor is 6·90 metres, the clear headway from the first floor to the under side of the beams above being 6·04 metres.

The space beneath the tank beams is 2·85 metres high, and, being enclosed by brick walls between the columns, it forms a basement which is amply lighted by windows 2 metres

wide by 1 metre high, one in each wall panel. Access doors are provided at each end below the entrance to the first floor.

Two outside stairways, each of twenty-five steps, lead from ground level up to a landing outside the longitudinal gangway between the rows of type G columns, and inside stairways run from the first floor to the second floor and thence to the terrace roof. The positions of these stairways are indicated approximately on the key plan (Fig. 142).

The front and back walls are set back a little from the outer face of the columns, the approximate thickness of the masonry being 22 centimetres nearly up to the second floor and 17 centimetres above the line in question. The end walls are 22 centimetres thick up to the level of the second floor, and 17 centimetres thick up to the roof. Figs. 146 and 147 show some of the horizontal wall beams running from column to column, these members as well as the vertical stanchions of concrete-steel between the main columns having the cross-sectional area of 15 centimetres square.

Detailed description of the second floor and of the upper portion of the building generally must be left until next week. In the meantime we may state, in concluding the present article, that the superload on the tank beam system works out at about 1,500 kilograms per square metre (307 lb. per sq. ft.), and that the calculated superload upon the first floor was 500 kilograms per square metre (102·5 lb. per sq. ft.). The latter is a small unit load, but, as the floor is merely provided for the convenience of the staff and not to carry heavy weights, it is quite sufficient.

The floors were designed with an ample margin of safety, and the official tests have proved that they are capable of supporting far greater loads per square metre than those mentioned.

OBITUARY.

M. PAUL DUBOIS.—We regret to announce the death, from influenza, of the eminent French sculptor M. Paul Dubois. He was born in 1829, and commenced life as a student of law, but at the age of 20 he abandoned the legal profession and entered the studio of Toussaint, where he worked for two years. He then went for three years to Italy to study the masterpieces of antique and Renaissance sculpture. His first work exhibited in the Salon, in 1853, was "St. Jean Évang." In 1855 his "Chanteur Florantin" obtained a great success. In 1873 he exhibited "Eve Naissante," and the same year was appointed curator of the Luxembourg Museum. To statues by him, "Le Courage Militaire," and "La Charité," intended for the tomb of General Lamoricière, were much admired in the Salon of 1876. The tomb itself, with the two other statues which completed it, "La Foi" and "L'Histoire," was exhibited in 1878. The tomb is now in the Cathedral of Nantes. In 1878 Dubois succeeded Guillaume as Directeur of the Ecole des Beaux-Arts, a post which he held until his death. Among other of his works may be mentioned the statue of Darc, erected in front of the church of St. Augustin; that of the Comtesse de Montmorency, now at Chantilly, and of which an illustration was published in the *Builder*; busts of Gounod, Baudry, Hauser, and Pasteur; and a splendid group, "Les Femmes d'Alsace," Dubois was a very talented portrait painter. It was he who introduced, at the Ecole des Beaux-Arts, the scheme for simultaneous instruction in architecture, sculpture, and painting. Dubois had obtained all the official honours which his high talent merited; he was twice recipient of the "Médaille d'Honneur" of the Salon, and a "Grand Croix" of the Legion of Honour. His death is a great loss to French art.

MR. TWEDALE.—We have to announce the death, on May 14, at his residence in the 32nd of Man, of Mr. John Twedale, during a period year. Mr. Twedale had been, during the firm of some twenty-six years, a partner of the firm of Messrs. S. E. Smith & J. Twedale, of Leeds, architects, which was dissolved at the end of the year 1903, when Mr. Twedale retired from practice. Of the architectural works carried out in Leeds by the firm, we may mention the following:—The parish room, cookery school, classrooms, etc., in Clarendon-road; the York City and County Bank; (illustrated in the *Builder* of December 19, 1896, No. 111, of our series, "The Architecture of our Large Provincial Towns"); the St. Luke's Day Schools; a large block of shops facing New Briggate and the town street; a warehouse in Whitehall-road; and the enlargement and improvement of the Christ Church Schools. Five years ago Messrs.

Mr. Smith & J. Tweedale made the plans and designs for the buildings erected at the County Council, for the East and West Yorkshire County Councils, to serve for students of the course of instruction given in the cultural Department of the Yorkshire College. The buildings comprise the dairy and store, and, in another section, the lecture hall, bacteriology and classrooms, with a laboratory, and female students' common-room, etc. Mr. Tweedale was architect of his own residence at Harrogate, a former Vice-President of the Leeds and Yorkshire Architectural Society. In 1881 he was elected an Associate and in 1889 a Fellow of the Royal Institute of British Architects.

SAMUELSON, BART.—Sir Samuel Samuelson, Bart., P.C., F.R.S., who was born May 10 at his residence, No. 1, Grosvenor-gate, London, S.W., aged 84 years, is the son of Mr. Samuel Henry Samuelson, merchant, of Liverpool. He established the extensive ironworks at Middlebrough, and in association with late Mr. Vaughan, was one of the resources of the Cleveland district in the production of iron. He was an eminent authority upon many matters connected with the manufacturing industries of Great Britain and the Continent, and the technical education of the industrial classes. Sir Samuel Samuelson was President of the Institution of Mechanical Engineers on Technical Instruction; and he was elected President of the Cleveland Ironmasters' Association, and framed the programme of the Select Committee on the Iron and Steel Industry and the Prevention of Floods in the Humber Valley; and, in 1871, was awarded the Telford Gold Medal for his services in connection with the manufacture of iron.

WILLIAM DREW.—We have to record the death on the 15th inst., at the age of 67, of Mr. William Drew, head of the firm of W. Drew & Co., architects, of Swindon. Mr. Drew had been in practice for forty years in Swindon and the district. He had designed a large number of the public buildings, residences, and business premises, etc., in this and adjoining towns. One of his most important buildings is the Clarence-street Schools, Swindon, one of the first planned on the small principle. He was employed by the late Swindon School Board, and was a member of the School Boards of two adjacent towns, Swindon and Cheney and Stratton St. Andrew. Mr. Drew had a large experience as a designer of hotels and public-houses, and was employed by many brewery firms and distilleries in the district, also at Oxford. The residence he built was Beachcroft, at Swindon, near Swindon, for Mr. Thomas Smith. The practice will be carried on by his son, Mr. William Drew, in the same style as before.

GENERAL BUILDING NEWS.

STURGEON, RUGSEY PARISH CHURCH.—The foundation-stone of the new church to St. George's Parish Church was laid recently by Lady Alexandra Paget. The improvements carried out provide not merely for the extension of a church, but for the building of a vestry, an organ-chamber, and a north porch. The scheme is to be carried out in accordance with the plans of Mr. F. A. Pearson, architect, of London, and the contract has been let to Mr. Edwin Whittingham, builder, of Newport, Salop.

ALBERT'S CHURCH, LEICESTER.—The foundation-stone was laid recently of the Church of St. George, which is being erected in Harrison-street, Leicester. The architect is Mr. Howard Thompson, and Messrs. Bradshaw Brothers the builders. The new church is planned to provide accommodation for a congregation of 1,000, and the clergy and choir stalls will seat 100. The total internal length of the nave will be 140 ft., the width of the nave will be 26 ft., and the aisles 10 ft. The nave will consist of five bays, with low arches of 16 ft. span. The ceiling will be a segmental curve, with moulded ribs, and the interior woodwork will be stained. The edifice will be erected with Ellistown red bricks 2½ in. thick, and the roof will be of heavy Delft Derbyshire stone. The main roof will be covered with a South Devon slate—the Procelly Rustico. The main roof will be made of red deal wood blocks on concrete, while the chancel and porch will be in mosaic. A low-pressure hot-water heating scheme will be carried out by Messrs. Astwell & Nesbit.

STURGEON, ARTHUR'S HILL, NEWCASTLE-ON-TYNE.—The Arthur's Hill Presbyterian Church, Newcastle, was opened on the 26th inst. The style of the buildings is late Victorian, and the church is built of local stone, with a tower and angle turret. The interior consists of nave, aisles, and transepts, with a vestibule, with gallery staircases

at front. The nave and other ceilings of the church are of pitch-pine. The seating accommodation is for 700, including choir seats, which occupy a platform immediately in front of the pulpit. The ground floor (which is laid throughout with wood-block flooring on concrete) has about 400 sittings, and the galleries. The whole of the pews are of pitch-pine. The gallery front is all in panelled pitch-pine, and the pulpit is all in pitch-pine, panelled and moulded, with similar framing on wall behind. The organ-chamber is placed behind the pulpit at gallery level. Behind the church, on the ground floor, there is a small hall, to be used for infants' classroom and prayer meetings, a vestry for minister, classroom, and tea kitchen. On the first floor, over same, there is a church parlour, over same, there is a lavatory attached. Beyond the organ-chamber are two classrooms. The heating is by low-pressure hot water, with radiators in vestibule, corridors, and staircases. The lighting is by Messrs. E. H. B. & Co., Newcastle; the electric lighting is in the hands of Messrs. T. G. Usher & Co.; and Messrs. Emley & Sons are responsible for the heating. The estimated cost of the church is 6,500.

COUNCIL SCHOOL, WEST HAM.—The foundation-stone of Hilde-road Council school was laid recently by the Mayor of West Ham. The school will be a forty-fifth block of elementary school buildings erected by the education authority of West Ham, and the first to be erected under the authority created by the Education Act of 1902. It comprises three blocks of buildings. The principal block, containing the boys' and girls' departments, is a two-story building of one floor; the manual instruction school and boys' covered playground forms the third block. The total number of school places provided in the three departments is 1,000 (infants 400, girls 300, boys 300). The site comprises an area of about 1½ acres, and has two long frontages to Chester and Hilda roads. The contract for the works, which includes heavy foundations owing to the nature of the site, amounts to 23,923, and is being carried out by Messrs. W. Greger & Son to the designs and under the supervision of the architect, Mr. William Jacques.

SCHOOL, CAMBERWELL.—A new County Council school, capable of accommodating about 1,000 children, has been erected in Grove-lane, Camberwell. The site adjoins a small open space which has been acquired by the Camberwell Borough Council. The school buildings are two in number, one being a two-story building for junior mixed children on the ground floor and for senior mixed children on the first floor. The other is a one-story building for infants, whilst a separate block is provided for a drawing classroom and a room for practical science on the playground level. The buildings were designed by and erected under the supervision of Mr. Thomas J. Bailey, the Architect to the Education Committee of the Council.

WHITLEY NORTH SCHOOLS, NORTHUMBERLAND.—The new schools at Whitley were opened on the 8th inst. by Colonel F. D. Blake. The accommodation is for 1,020, arranged in three blocks of 340 each, for the use of boys, girls, and infants. The entrance to the two latter adjoin, and that for the boys is off another street. Each school is approached by two entrances, with cloakroom and lavatories, and comprises a central hall and six classrooms, which open directly off the hall. The whole of the interior floors are of solid blocks, and the walls have tinted glazed brick dados. On the exterior the walls are of red facing bricks and stucco work, and the roof covered with green slates. The heating is by hot water on the low-pressure system, with ventilating radiators and valves to admit and regulate the fresh or warm air, the foul air being extracted from each room and conveyed to turbine furnished with electric fans. The buildings have been erected from the designs of Mr. W. H. Knowles, architect, Newcastle; Messrs. J. & W. Simpson, of North Shields, being the contractors, and Mr. J. Nicholson the clerk of works.

NEW HALL, ST. GEORGE'S PRESBYTERIAN CHURCH, NEWCASTLE-ON-TYNE.—A new hall has been built by the congregation of St. George's Presbyterian Church, in Jesmond-road, Newcastle. The hall will seat 500, and cost 2,500. The new building is a stone structure, with the main front facing Jesmond-road. In addition to the hall, a church parlour, infants' classroom, vestries, and caretakers' house. Low side aisles have been planned which, by means of folding partitions or curtains, can be formed into class or ante rooms of varying sizes, and shut off from the central space—large enough for ordinary services—which is

lighted by clerestory windows on either side, in addition to the semi-circular window in the main gable. For special occasions, the whole space can be thrown open, giving accommodation for over 600. The building has been erected by Mr. S. F. Davidson, contractor, Newcastle, who has also installed the system of heating. Electric lighting is arranged for throughout, and an electric fan is provided for the extraction of vitiated air, this having been carried out by Messrs. Rowland Barnett & Co., Newcastle. The architects are Messrs. Cockett & Burns Dick.

POORHOUSE, OMOA, N.B.—A new combination poorhouse for the parishes of Cambusnethan, Bothwell, and Shotts has been erected near to Omoa railway station, in the parish of Shotts. The site extends to 10 acres, and the institution consists of ten different blocks of buildings, providing accommodation for 203 inmates under the following classification:—Receiving or probationary block, ten; four ordinary pavilions, two stories in height, divided into dayrooms and dormitories for seventy males, forty-eight females, and twenty-four children; hospital block, twenty-four males and eighteen females; and a ward of accommodation for maternity cases. In this block the doctor's office is also a block of two cottages, intended for married couples. The administrative is the largest, adding of the group, and here are placed the common-room, office, visitors' waiting room, besides accommodation for the governor and servants. The kitchen and dining-hall are connected with pavilions by covered ways. The wash-house, laundry, workshops, boilers, and engines are placed to the rear of the administrative block. The mortuary is situated on the east portion of the site, and consists of mortuary post mortem and service room. There is also a range of stable buildings, pigery, etc. The outer walls are built of stone and lined inside with brick, having a space between for ventilation. The cost of the whole undertaking will be about 175,000 per bed. The architect is Mr. Alex. Cullen, Motherwell.

LINTHOGH JOINT HOSPITAL.—Linthogh Joint Fever Hospital was opened on the 12th inst. by Colonel Chalmers, of Longcroft. The hospital is situated on the south side of the Burgh of Linthog, on the rising ground near the combination poorhouse. It contains twenty-five beds. In the centre of the buildings is the administrative block, containing apartments for the house doctor, the nurses, and the caretaker, while at each end is a ward for the observation of doubtful cases. There are two pavilions, which are divided into male and female wards. Behind the principal buildings are the necessary offices, laundry, disinfecting apartments, dairy, receiving apartments, etc. The architects were Messrs. John Melvin & Son, Alloa, and the total cost is expected to be about 9,000.

LIBRARY, LEICESTER.—The new free library at Leicester, which has been erected in Bishop-street at a cost of 12,000, exclusive of the interior fittings, was opened on the 8th inst. The entrance in Bishop-street gives access to a hall with a mosaic pavement. The walls are right in the reading-room, 80 ft. by 31 ft. Placed down the centre are five tables with sloping tops, and at the further end are four flat tables. On the side walls are fixed desks for newspapers. The lending department is separated from the librarian's quarters by a long counter. An electrical hoist goes from this department, and serves all of the floors. At the Bowling Green-street end of the room a winding iron staircase leads to a spare room, which will be used for storing newspapers, etc. Four flights of stairs, with landings at the termination of each one, are ascended from the hall in order to get to the reference library. The top landing of all has a tessellated Venetian pavement. On the left is the office of the librarian. On the opposite side are private lavatories, the walls of which are lined with opalite. The reference-room, which is entered through double glass doors, is of the same dimensions as the reading-room below. It has arched ceiling decorated in fibrous plaster, wood-block floor, and twenty-four tables. The ladies' room opens out of the larger one, on the left. The rooms measure 31 ft. by 24 ft. The floor is of pitch-pine. On the top floor of all is a committee-room. The juveniles are provided for in the basement, where a room has been allotted to them. The floor is of Venetian coloured work. The basement also contains departments for patent specifications, bound files of newspapers dating over half a century back, and stores. A little room has also been provided for the staff, which they can use as a dining-room. Here also are lavatories, the boilers, and apparatus for lighting and heating. The architect of the building was Mr. Burgess.

LIBRARY, MANSFIELD.—The new free library for Mansfield has just been completed. For the new building competitive plans were invited to be sent in by selected architects, the choice eventually falling upon the one sent in by Mr. E. R. Sutton, Bromley House, Nottingham. The building comprises a large reading-room, a reference reading-room (which will also be utilised as a magazine reading-room), separate ladies' room, the lending library, the librarian's office, and a storeroom.

LOWESTOFT FREE LIBRARY.—The new free library at Lowestoft, situate in Clapham-road, and adjoining the technical schools, has just been opened. Mr. George William Leighton, of Ipswich, was the architect, and his plans were selected in competition by the assessor, Mr. Jonathan Bottle, of Great Yarmouth. The building contract was entrusted to Mr. G. Hawes, Norwich and Lowestoft. The building is of red brick, with Bath stone dressings. The visitor approaches the main entrance by way of the tower porch, beyond which a corridor extends, giving access to the magazine and news room, 34 ft. square. This room is controlled by an observation window from the librarian's office. The corridor gives access to the borrowers' lobby. From the corridor a marble staircase, lighted by a dome, with marble casings and panelling to the walls, leads to the first floor, where is the reference library, 30 ft. by 42 ft., lavatories, and the librarian's private room. Facing Clapham-road is the magazine-room, 42 ft. by 34 ft., with an open timber roof, and three overhanging oriel bay windows. At the opposite end of this floor is the reference library, panelled and fitted with bookshelves in bays under an arched gallery. This room is lighted by a central dome, as well as by side windows. There are also other staff-rooms and offices, and retiring-rooms. The roof of the building is covered with Welsh slates; and rising at a point immediately above the main entrance there is a fleche, which will serve for the ventilation of the entire building. The whole of the rooms are wood-panelled throughout. The flooring is fireproof, and the building warmed by a low-pressure hot-water heating apparatus.

PUBLIC LIBRARY, KING'S LYNN.—The new public library at King's Lynn was opened on the Tower Field site on the 18th inst. The walls are faced with oar stone, with dressings of terra-cotta, and the roof is covered with slates. The central feature of the design is a square tower, 44 ft. in height, forming part of a projecting bay, 30 ft. wide, at the south-east corner of the Tower field. From this point two wings diverge at an angle of 60 deg., and each wing is relieved at 12 ft. from the corner of the entrance bay by another projecting bay, of octagonal form, some 15 ft. across, and containing windows, in one case of a committee-room, and in the other of the staff-room. Thence each wing extends a further distance of 50 ft., divided into five bays, the window in the central one being carried up into a dormer. The wing facing London-road contains a news-room, measuring 48 ft. by 21 ft., and that adjoining Greyfriars-road a "reviews" room (or general reading-room), about 30 ft. by 20 ft., and a reference-room 20 ft. square. The space intervening between the two wings is allotted to the lending library, which is in future to be managed on the "open-access" system, borrowers being allowed to go to the shelves and choose their own books. The staff, located within the segmental enclosure in the centre of the building, with the rows of shelves radiating from it, will have a complete view of the lending department (the entrance and exit of which will be governed by turnstiles), and will also be able to see, through glass partitions, all the other rooms allotted to the public. Mr. H. J. Green, of King's Lynn, is the architect.

STAINED GLASS AND DECORATION.

WINDOW, WALKERBURN CHURCH.—A large single-light stained-glass window has just been erected in Walkerburn Church, Scotland, to the memory of Agnes Ballantyne by Messrs. Percy Bacon & Brothers. The figure represented is S. Agnes, who is depicted with a wreath of simple flowers, holding a palm, and with a lamb at her feet; there is a curtain behind the figure, and above are angels holding a scroll, upon which are inscribed the words, "Ecce Agnus Dei."

APPOINTMENT.

CHICHESTER.—At the meeting of the Chichester City Council, on the 18th inst., Mr. Frank J. Lobley, of Hale, Cheshire, was appointed Surveyor and Inspector of Nuisances; 123 applications for the post were received.

SANITARY AND ENGINEERING NEWS.

REBUILDING PLOUGH BRIDGES, BYLEET.—Much interest is being taken in the work of rebuilding Plough Bridges. Whatever claims the old wooden structures had to picturesque-ness, they were sadly lacking in stability, and drivers of vehicles crossed them in fear and trembling during the not infrequent floods. On being demolished they were found to be very rotten, and practically unsafe for vehicular traffic, even when there was no such special strain put upon them. The contractors are Messrs. Edwards & Co., of Strand, and Mr. R. St. George Moore, of Westminster, is the engineer, whilst Mr. W. E. Judd was selected to look after the interests of the Chertsey Rural District Council as clerk of the works. The contract price is 3,162. Two spans will be used to cross the River Wey, and one span will bridge the mill-stream. The foundations and abutments are now being put in, considerable difficulty in connexion with the foundations being experienced, owing to obstructions encountered below water level. The remains of previous bridges for centuries back have had to be removed. The foundations of the pier in the middle of the Wey will go down about 15 ft. below water level, and it will be capped with granite to carry cast-iron columns supporting the bridge. —*Survey Advertiser.*

WATER SUPPLY, FYRLINGDALES, NEAR WHITBY.—On the 11th inst. Colonel A. G. Dufford, E.E., Local Government Board Inspector, held an inquiry into the application of the Whithy Rural District Council for sanction to borrow 1,650l. for the purposes of increasing the present supply of water to those living within the area of the supply at Fylingdales by the purchase of additional springs, the construction of reservoirs, laying of mains, etc. Mr. F. G. Fairbank, A.M.Inst.C.E., York, who is responsible for the scheme, gave evidence, among others.

THE ROYAL SANITARY INSTITUTE.—At an examination in sanitary science as applied to buildings and public works, held in Edinburgh, May 19 and 20, 1905, one candidate presented himself, Mr. A. R. Myers (Edinburgh), to whom a certificate was granted.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. Joseph Peebles, quantity surveyor, has removed his offices from 23, John-street, Bedford-row, to 7, Southampton-street, Bloomsbury-square, W.C.—Mr. G. Clifford Potter, 18, Eldon-street, E.C., has been appointed sole agent in the United Kingdom for Messrs. C. F. Beer Sohne, manufacturers of tar products, Cologne.

EXPORT OF NICARAGUAN LUMBER.—Mr. Biggam, the British Consul, in his annual report on the trade and commerce of Nicaragua, writes that the published Government returns of the export of wood only give the shipments made from the Pacific coast; the value of these shipments in the year 1903 amounted to 3,867l., of which dye woods, brazil and mora, were represented to the value of 550l. All the brazil went to France, one-half of the mora to the United Kingdom, the other half being equally divided between France and Italy. Of late years the shipment of dye woods from Nicaragua has fallen off to a great extent, owing to the low and constantly fluctuating price in Europe, and the heavy expenses in connexion with the shipments. The value of lumber exported from the Pacific coast during the same period amounted to 3,317l., of which the chief items were:—Mahogany, 211l.; cedar, 1,315l.; sawn lumber and boards, 1,621l. The greater part of the mahogany and cedar went to the United Kingdom, the shipments being valued respectively at 121l. and 1,290l. Of the sawn timber and boards, the value of 1,360l. was sent to Salvador, and the rest to the United States of America. In the forests of Nicaragua there is a great deal of valuable wood, which, owing to the want of roads and means of transport to the coast, cannot at present be profitably exported, but in the future will doubtless be a source of wealth to the Republic. Besides mahogany and cedar the following excellent woods are abundant:—Lignum vitae, the white oak, used by guano-caste, which gives a good building lumber, and also produces a gum that can be used as a varnish; jenisero, which possesses many of the qualities of the cedar, and grows to a much larger size; cortez, called, on account of the hardness of its wood, "Falo de Lierro," or iron tree; the white oak, used by coopers; the guapinol, which produces a gum said to be equal to the copal of Ceylon; mangle, the wood of which is used for posts of houses and can remain underground for many years without rotting; madrono, a similar wood to boxwood; guachapilin, from which most excellent railway sleepers are

made; and rosewood, which has a beautiful grain and is well adapted for cabinet work. Amongst trees giving dyes are the brazil, mora, and fustic. Trees of medicinal value are the copaliba, liquid amber, balsam of Peru, and cinchona; and amongst trees giving industrial products are the induriba, gutta-percha, dragon's blood, vegetable wax, divi-divi, and annatto. On the Atlantic coast an American company hold the monopoly for the shipment of mahogany. This company has been working for many years, and has invested a very large capital in its plant, which includes several miles of railway. The work employs large gangs of labourers, among whom are a number of natives of the Bahamas, who are usually brought out under contract. The company's principal logging camps are situated in the district of Rio Grand or Great River. The logs that are cut are thrown into the creek and streams that empty into Great River. On the flooding of the creeks in the rainy season the logs are floated down to that river, where they are caught by booms and made into rafts. The rafts are then towed down the river by small steamers to alongside the coast-steamers, which lie outside of the bar or entrance to the river. The Government returns do not give the value of the mahogany shipped from the Atlantic coast, but the returns of the Bluefields Custom-house show that export duty was paid in the year 1903 on 15,130 logs.

INDIAN IRRIGATION.—Irrigation works in the Indian Empire now include more than 3,700 miles of main and branch canals, and 28,000 miles of distributory channels serving nearly 30,000,000 acres of cultivable land. Although representing a capital outlay of about 25,000,000l., these works yield a net revenue to the Government of nearly 2,000,000l., or something of indirect returns. Hence, they fully maintain their reputation as the most remunerative and beneficial public works in the world. Among the artificial waterways of India, the Chenab canal is a remarkable work, which nearly 2,000,000 acres, of which nearly 2,000,000 acres were actually irrigated last year, and yielding a net return to the State of 25 per cent. on the capital outlay. It has enabled the Government to deem 1,805,000 acres of grazing land, increasing the population of the same area from 800,000 in 1901 to 1,200,000 in 1903. The value of the crops raised by irrigation from the canal is estimated at about 3,700,000l., and a branch line has been built to transport surplus produce to the North-Western Railway. This line paid, in 1904, a dividend of 22 1/2 per cent. on capital. The aggregate value of exports from the port of Karachi in question is estimated at 2,750,000l., which is considerably more than the cost of the canal and railways together. Results such as these amply justify the position of those who have for years past steadily pressed upon the Government of India the desirability of, and the necessity for, liberal irrigation programmes.

UNITED STATES CEMENT TAXES.—Official statistics published show that the value of imports of cement into New York has again fallen from 75,000l. in 1903 to 24,400l. in 1904, and the total imports into the United States have decreased in the same period from 605,000l. to 277,000l. The report on the production of cement in the United States in 1903 showed that the total production of hydraulic cement was about 29,900,000 barrels, showing an increase of over 4,000,000 barrels as compared with 1902. Of these, 7,630,000 barrels were Portland cement, 7,630,000 barrels natural rock cement, and 25,000,000 barrels of suolana or slag cement. The increase in the production of Portland cement resulted in a glutted market; a large quantity remained unsold at the close of the year 1903, and prices fell in consequence. Pennsylvania is the largest producer, having seven works with an out-turn in 1903 of 9,740,000 barrels. In New Jersey there are three works with a production of 2,700,000 barrels, and in New York twelve works with a production of 1,603,000 barrels. In 1904 the trade was greatly depressed; one of the works in New Jersey closed till the demand should improve. The producers were working on short time, and fell to about 85c. (3s. 6d.) per barrel, but a meeting of manufacturers in December was resolved to raise the price to 90c. (3s. 9d.) as a little over 4s. so as to avoid working at a loss.

No. 17, FLAT-STREET.—The rehabilitation of the front of the old house is being carried out by Mr. W. Downs, of Walworth, and is being supervised by Mr. W. Downs, of Walworth. The front, and the ceiling of the large room on the first floor, reputedly the council chamber of the Duchy of Cornwall, temp. Henry, Prince of Wales, in the XVth century, are being restored and repaired at South Kensington Museum, and will be replaced in their former positions.

CORPORATED CHURCH-BUILDING SOCIETY.—The Society held its usual monthly meeting on Thursday, the 18th inst., at the Society's house, 7, Deauville-gate, Westminster, the Rev. Canon Norman in the chair. A large amount of money was made in aid of the objects, viz.:—Building new churches, and enlarging the churches at Bledford, St. Mary, Radnor, 202; Fen Drayton, St. Mary, Cambridge, 101; Kirtlington, St. Mary, Oxford, 201; Llandrindod Wells, Holywell, Brecon, 1501; Rushall, St. Matthew, Pwllheli, 1501; Stanton Harcourt, Oxfordshire, 351; Holy Trinity, near Sparkwell, Somerset, 151. The following grants were also paid for works completed:—Over, St. Chad, Cheshire, 601; Herbrandston, St. Mary, near Milford Haven, 201; Skewen, near Glam., 301; and in addition to this the sum of £100 was paid towards the repairs of the churches from trust funds held by the Society.

FUNDING HOSPITAL CHAPEL.—The Committee of the Foundling Hospital, using the opportunity given them by the urgent need of repairs to the windows of the chapel, have requested the aid of the City of London and the Corporation of London, which composed the original scheme of the glass, and have substituted antique designs formerly there. The old small square formed of cast-iron bars, of a comparatively recent date, together with stained glass, have been entirely removed, and replaced by a new design supporting the leaded glass. The coats of arms are now set in oval leaded frames, and are disposed about the field of clear glass and the surrounding spaces; semi-circular heads and arches are decorated with wreathing of a classical type in gold and brown tints. The work has been carried out by Messrs. James & Sons, of Whitefriars, in conjunction with the resident surveyor of the hospital, Mr. W. H. Chubb.

LONDON BUILDING ACTS (AMENDMENT) BILL.—A circular letter is being sent to the Metropolitan Borough Councils on behalf of the Council of local Authorities which recently sat, asking the councils to embody views expressed in the following resolutions in any Bill which is sent to the London County Council on the subject of the London Building Acts (Amendment) Bill:—
"That with reference to the communication addressed to the Metropolitan Local Authorities on the subject of the amendment of the Building Acts, this conference desires to express the view expressed at its former meeting, that any amending Bill is drafted the whole of which is the subject of the Acts should be referred upon by a Royal Commission, in order that new legislation may not only provide for the amendment of the Acts, but also for the amendment of the Acts in a substantial degree of the administration of the Acts from the local authorities."

It is suggested to the Metropolitan Local Authorities that they should, in replying to the communication of the London County Council, state clearly that no Amendment Bill will be satisfactory which does not provide for all the duties under the Acts which are currently discharged by the local authorities transferred to those bodies in accordance with the views expressed by the Royal Commission.

TOURS AT ABERDEEN.—The Visiting Committee of the heritors of Old Machar, appointed to visit the St. Machar Churchyard, Aberdeen, had under consideration a report from Mr. J. Kelly, architect, on the condition of the tomb of Bishop Lightoun and Bishop Dunbar. It means that might be taken for their preservation. The Committee recommend the heritors that, with respect to Bishop Lightoun's tomb, the effigy and the part bearing the inscription be taken inside the cathedral, and the tomb space be built up and an inscription placed there stating whose tomb it is. With respect to Bishop Dunbar's tomb the Committee have deferred decision.

HOUSING OF THE POOR: CONFERENCE IN LEEDS.—Under the auspices of the National Housing Reform Council and the Leeds Trades and Labour Council, a conference to consider housing of the poorest of the poor took place on the 17th inst. in the People's Hall. In the circular convening the meeting it was stated that, according to the Census of 1901, there were in Leeds 782 one-room houses, 1,022 two-room houses, 16,725 three-room houses, and 25,594 four-room houses. Adopting the Census standard of overcrowding, viz., the presence of more than two persons to one room, more than four persons to two rooms, the figures showed no less than

16,558 of the dwellers in one and two room houses were overcrowded, while 26,681 of the dwellers in three and four room houses were overcrowded. The meeting was presided over by Mr. T. Waud, President of the Trades Council. The chairman said it was clear that the condition of the poorest of the poor must be looked after by those who were better off. It was obviously the duty of the municipal authority to see that the homes of the very poor were healthy. With regard to the cost, it ought to be borne in mind that it would be better for a municipality to spend money in this direction than on many other objects. Some dwellings were not fit for even one person to live in. While the housing problem was left to the speculative builder the aim would be to get as big a return as possible for a small outlay. The Corporation were the only bodies that could deal with the problem effectively. Mr. Aldridge said it was desirable to educate public opinion in such a way as to make people wonder fifty years hence how it was possible for back-to-back houses to be in existence at the opening of the XXth century. What so much had been done by the Leeds City Council, especially in regard to the Quarry Hill district, there remained still much to be done. One way of solving the problem was the raising of the wages of the poor. Mr. Connellan moved a resolution in favour of the appointment of a committee to consider the best methods of improving the housing needs of the poorest of the poor. Mr. T. C. Wilson seconded the resolution. He said he was in favour of the Corporation building houses, and letting them at a possible loss to the ratepayers, would be that an employer of labour might get a man to work for less than might otherwise be the case. Still he was in favour of the Corporation building these houses. The resolution was unanimously adopted. It was agreed to invite leading citizens to become members of the committee, and to hold another conference on a date to be fixed upon.

CAPITAL AND LABOUR.

NEWCASTLE BUILDING TRADE DISPUTE.—A round table conference was held on the 17th inst. at the offices of Messrs. Oliver, Leeson, & Wood, in Mosley-street, Newcastle. The conference was taken part in by representatives of the masters and men, together with Messrs. Leeson & Dyson, and it lasted for two and a half hours. Though it was hardly possible for anything to be done in the way of bringing the dispute immediately to a close, some progress was made, and there are hopes that a settlement will be arrived at in a short time. The general principles affecting the different trades were discussed, and the meeting was adjourned, it being decided that sectional conferences should be held. This means that the masters, together with Messrs. Leeson & Dyson, will meet each trade separately in order to discuss matters which particularly affect that trade. From the tone of the discussion it was evident that there was a prospect of mutual concessions being made, and thus there is a belief that the dispute will end speedily and reasonably. *Newcastle Chronicle.*

THE EDINBURGH JOINERS' STRIKE.—With regard to the decision of the Edinburgh Joint Association to accept the offer of arbitration or mediation made by the Lord Provost (Sir Robert Cranstoun), through Conciliator Currie, it is understood that the Masters' Association have agreed to take no notice of the offer, and not to entertain any proposal for arbitration.

Legal.

ACTION BY ARCHITECTS FOR FEES.

In the King's Bench Division, on the 19th inst., the hearing was concluded, before Mr. Justice Lawrence and a special jury, of the case of Meaby and another v. Lloyd and others (trustees of the Hearts of Oak Benefit Society).

In this case the plaintiffs brought the action to recover from the defendants 3,374*l.* for fees and work done as joint architects for the Hearts of Oak Benefit Society. The defendants pleaded a denial of liability on the grounds that the plaintiffs invited to send in plans for a new building to be erected in the Euston-road, the cost of which was not to exceed 55,000*l.*; that the plaintiffs' plans having been accepted by the board of delegates of the Society they were asked to make certain alterations; that the proposed building with the alterations could not be erected for less than 95,000*l.*; that the plaintiffs warranted that their design, with the alterations, could be carried out at a cost within 10 per cent. of their original estimate—and that was the basis of their contract. The

defendants also counter-claimed for 1,240*l.*, fees they had paid to a quantity surveyor in connexion with plaintiffs' plans.

Mr. Spencer Bower, K.C., Mr. Ernest Wild, and Mr. Artemus Jones appeared for the plaintiffs, and Mr. Acland, K.C., and Mr. Spence for the defendants.

Mr. Spencer Bower, in opening the plaintiffs' case, said it was an action for fees in relation to new offices of the defendant Society in the Euston-road. He said that in 1901 the defendants employed Mr. Meaby to get a site for the new building, and then they voted 55,000*l.* for the building, and invited a competition in design. The plaintiffs competed, and their design obtained the second award in the competition. The Society afterwards adopted the plaintiffs' design. The Society said that if the design could not be carried out within 10 per cent. of the estimate, then the plaintiffs were not to be paid any fees. The case for the plaintiffs was that the building could have been erected from their designs at the estimated cost, but the building was very much altered, and the conditions of the competition did not apply. All the designs of competitors were drawn on the supposition that the building line would be that of the Women's Hospital, Euston-road. The County Council would not consent to that, and the building had to be set back 25 ft., which involved a new set of plans and drawings. On December 31 Mr. Sidney R. J. Smith, an architect, reported to the sub-committee that the building, according to plaintiffs' design, could be erected for 45,000*l.* On May 22 there was a resolution adopting the plaintiffs' design. On May 24 Mr. Meaby proceeded with the revised plans, and was retained for that purpose by the building sub-committee. On June 5 the executive council met and resolved that plaintiffs' designs for the new offices should be accepted, and that they should proceed with the work with all diligence. On June 10 they wrote to the plaintiff as follows:—"Please therefore take notice that you will proceed with all dispatch in completing the requisite plans, etc., for which the usual percentage will be paid. Messrs. Fortune & Bromage will wait upon you with regard to the alteration of the plans." After an enormous quantity of work was done, the defendant Society refused to pay the plaintiffs anything. It was said that the plaintiffs had not complied with the conditions of the competition. That might be true, but the plans sent in by the plaintiffs were with reference to a building in an altered state, and the conditions of the competition did not apply.

Mr. Michael Charles Meaby, examined, said he was an architect and surveyor, and an Associate member of the Institution of Civil Engineers. From February, 1899, until June, 1903, he was surveyor for the defendant Society. In April, 1901, he did certain work in connexion with the purchase of the site on the Euston-road, and also in negotiating with the owners of the property on that site. In August, 1901, the defendant Society invited competitive designs for the proposed new building on that site. The candidates were invited to send in questions. There was a note also sent out to the competitors that they were to assume that the front building line was to come into the line of the Women's Hospital. That line was made the basis of the competition. Another condition of the competition was that no alternative design was to be sent in. Upon the basis the cost of executing the design was not to be more than 10 per cent. in excess of 45,000*l.* There was a good deal of discussion as to the frontage line, viz., as to whether he was to keep to the existing building line or as to whether he was to get the consent of the London County Council to go 25 ft. further forward in line with the Women's Hospital. Mr. Fortune was a member of the building committee, and subsequently of the sub-committee. After discussion, it was decided to adopt Mr. Fortune's view, and that the building line in the competition should come forward. In conjunction with Mr. Webbe he sent in a design for the competition, and that design proceeded on the line of the Women's Hospital. He sent that design in on December 20, 1901. He sent in with that design a statement of cubes, a brief estimate, and descriptive report in accordance with the conditions. It was a condition of the competition that the designs should be sent in anonymously. On the statement as to the cubic contents, he calculated the price at 1*s.* per cubic ft., and that worked out at 46,048*l.* A building from that design could have been erected for the price he had put upon it. The London County Council decided that they could not have that building line on March 3, 1902. Mr. Sidney Smith awarded their design the second premium, and he stated that he considered the estimate of the cost was right. On June 10, 1902, he received a written retainer from the Society,

when the tiles are placed in position in the ribs on one tile engage in recesses of adjacent tiles and form channels by which rain can flow off the tiles, together with any other condensation which may form on the surfaces of the tiles, and so that wind, rain, or water is prevented from entering to loosen the tiles.

1904.—R. ILES: *Sliding Window*

Window sashes, consisting in the combination of a casement, taper tongues, or otherwise, grooves in the sashes adapted to engage with the tongues or slides, and for holding the sashes in any desired position in said grooves, and springs and recesses to engage with the inclined taper tongues or slides.

1904.—H. F. WILSON: *Fireplaces*

This invention relates to open fireplaces of the grate type, and its object is to construct and arrange the fuel holder portion of the fireplace in such manner as to form a slow combustion grate of simple and efficient construction. According to this invention, the fuel holder portion of the fireplace comprises downwardly-sloping base member which is provided with upstanding side portions, and inwardly sloping back portion, whilst transverse across the front edge of the base member is provided a rib or rim which stands above its front upper surface, whilst said rib or rim is of such depth that its top comes in a horizontal line with the back edge of the fuel holder. The fuel holder, when used in position within the fireplace, is so arranged that the upper surface of its front rib comes in line with or on the same level as the tiled hearth or floor level, when the fuel holder of the holder is sunk below floor level so as to form a chamber fire, the support combustion passing thereto by the front of the upper front.

1904.—H. H. LAKE (F. S. Miller): *Hoisting and Conveying Apparatus*

Hoisting apparatus, consisting in the combination with a hoisting rope, a lifted support member which is pendent, and a swinger guide engaging the pendent portion of the hoisting rope and lifted support, a swinger rope leading from said swinger guide in the direction of swing, and the following means whereby said swinger guide and the pendent member of said hoisting rope are moved relative to the plane of swing, viz., two ropes, which forms a running connexion with said hoisting rope, and the other with said swinger rope, and each of which extends beyond the plane of swing.

1904.—A. E. EDWARDS (Society of Glass, Grain, & Nicolas): *Glass Plates or Tiles for Covering Buildings, and the like*

This invention has for its object the application of plates, pieces, and panels of glass, cast, or of all shades of colour, transparent, or opaque, which are to be employed in the form of plates upon the outer surfaces of buildings, tiles, and also as decorative pieces. All the glass plates or pieces are provided with attachments at their backs or edges, or cast or moulded with the corresponding parts of which they form a part, or made entirely of metal or other material embedded in the glass. The attachment for holding the glass plates or tiles upon the bricks or other material with the plates or are embedded in the back of the glass plates, they may be of metal or other material, and in general will be in the form of bands with

1904.—E. P. WHEELS: *Re-inforced Concrete Construction*

Metallic skeleton for re-inforcing concrete structures, comprising a number of rods extending in two cylindrical parts connected together by an intermediate diaphragm or web of series of hanger bars provided with cup-shaped ends, and secured at one or both ends to the rods by being bent around the rods or being passed through the diaphragm and bent around one-half of the said

1904.—A. L. P. CHARLES: *Sheet-metal Rugged Facings for the Treads of Stairs, and the like*

This invention relates to sheet-metal rugged facings for the treads of stairs, and the like, and has for its object to prevent slipping. The object of this invention is to prevent too rapid wear of the treads of stairs, and the like, for this purpose there are formed in the plate, a little beyond the external row of rounded conical projections such as usually provided, rounded bosses which are preferably arranged shallower than the said projections. In application of facings provided with these

bosses to the treads of stairs, for example, the foot of the person ascending the stair comes in contact with the said bosses placed near the nosings of the step, so that the first row of truncated conical projections is protected by said bosses.

1,725 of 1905.—F. LOHNTZ: *Apparatus for Breaking up or Cutting Rocks, Stones, or Earth Under Water, or on Dry Land.*

A rock-cutting apparatus, consisting in the combination of a rock cutter, a rope, or its equivalent, for raising the rock cutter, sheer legs or equivalent structure, a hoisting winch, a clutch on the winch, and a device arranged on the sheer legs or equivalent structure, and connected with a sample, sent to or left at this office, unless he has specially asked for them. Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

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All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.
May 9.—By VERNON & SON (at Thame).
Stokenchurch, Bucks.—"Stokenchurch Farm Estate," 218 a. 0 r. 2 p. f. £1,850
May 11.—By SEDGWICK, SON, & WEALE (at Boxmoor).
Bovingdon, Berks.—High-st., butcher's shop and premises, with slaughter house, orchard, etc., c. y. r. 264. 500
Hemel Hempstead, Herts.—34 and 35, Green-end, u.t. 341 yds., g.r. nil, w.r. 134. 320
By HARRIS STAGGE (at Redhill).
Redhill, Surrey.—57, Somerset-rd., l. r. 301.
Earlswood, Surrey.—Earlsbrook-rd., "Kings-cote" and "Roath," l. y. r. 664. 960
Earlsbrook-rd., freehold building plot 190
Earlsbrook-rd., freehold building plot 410
By BUCKLAND & SONS (at Burnham).
Burnham, Bucks.—Shepherd's-hill, an enclosure of 12 a. 1 r. 35 p. f. 300
1 to 20, Fairfield-cottages, l. y. r. 359. 4,940
Church-st., seven freehold cottages, w.r. 704. 2s. 780
Clippham Green, four cottages, l. w.r. 1462. 8s. 1,640
Clippham, four houses, shop, and cottages, l. y. r. 304. 1,010
Clippham, two freehold building plots 219
"Clippham Place Farm," 12 a. 2 r. 27 p. f., y. r. 604. 1,275
May 12.—By J. A. ROGAR (at Liphook).
Headley, etc., Hants.—Portions of the Headley Estate, about 45 acres, l. (in lots) 4,255
May 15.—By J. H. BETHELL.
Penge—24 and 26, Hawthorne-gr. f., w.r. 411. 12s. 340
Walthamstow—56, Forest-rd., l. w.r. 281. 12s. 390
By ALAN BOOTH.
Camden Town—197 and 199, Camden-rd., u.t. 34 yds., g.r. 264, y. r. 1564. 1,200
By E. & J. SWAIN.
Bayswater—116 and 117, Denbigh-mews, and 24, Denbigh-ter., u.t. 392 yds., g.r. 104, y. r. 932. 10s. 580
By E. H. HENRY.
Clapham—108 and 114, Cavendish-rd., u.t. 75 yds., g.r. 124. 13s. 7d. 720
4, Grove-rd., u.t. 75 yds., g.r. 114. 11s., y. r. 504. 510
48, Lynette-av., u.t. 79 yds., g.r. 74. 10s., y. r. 424. 13s. 7d. 400
Peckham—Rye-la., l.g. rents 804. 17s., u.t. 51 yds., g.r. 404. 720
St. John's Wood—44, Abbey-gdns., l.g. rents 64, u.t. 34 yds., g.r. 64. 910
By ORGILL, MARKS, & BARLEY.
Peckham—Rye-la., the "Odd Fellow's Arms" b.h., l. y. r. 2504. 7,500
Mile End—Globe-rd., the "Queen Victoria" b.h., l. y. r. 474. 1,900
Marylebone—Shroton-st., the "Perseverance" b.h., u.t. 461 yds., y. r. 454. 1,650
Hackney-road—No. 450, the "Norfolk Arms" b.h., u.t. 404 yds., y. r. 454. 500
Poplar—Chrisp-st., the "Early Bird" b.h., u.t. 134 yds., y. r. 504. 750

By BUCKLAND & SONS.

Ashford, Midd.—Stamwell-rd., "Ford House" and 12 a. 0 r. 34 p. f., y. r. 914. £3,000
Kentish Town—55 and 57, Holmes-rd., area 14,850 ft. l. p. 2,050
61 and 63, Holmes-rd., the "Malt and Hops" b.h., and builder's workshop and premises, l. y. r. 284. 925
May 16.—By G. BRINSLEY & SON.
Ealing—7, Colindale-villas, u.t. 74 yds., g.r. 64, 6s., a. r. 24. 395

By H. DONALDSON & SONS.

Dalston—79, Albert-rd., u.t. 46 yds., g.r. 64, y. r. 344. 395

By G. HEAD & CO.

Hammersmith—165, Hammersmith-rd. (The London Laundry Co.), beneficial lease for 38 yrs., y. r. 1804. (including goodwill, plant, machinery, etc.) 1,010

By ROBSON, RICHARDS, & CO.

Brixton—15, 17, 18, and 19, Trevelyan-rd., u.t. 744 yds., g.r. 264. 8s., y. r. 1324. 1,045
Norwood—30, Bamore-rd., u.t. 68 yds., g.r. 84, 6s., y. r. 494. 300

By J. S. MORTON.

Brixton—61, Upper Tulse-hill, l. y. r. 704. 1,000
69, Upper Tulse-hill, u.t. 364 yds., g.r. 74. 10s., y. r. 504. 405
135, Upper Tulse-hill, u.t. 304 yds., g.r. 174. 10s., y. r. 554. 375
Bromley—14 and 16, Loveridge-rd., l. y. r. 704. 1,150

By D. SMITH, SON, & JACKSON.

Leeds, Kent.—"Rutland Cottages" (two), and 20 a. 2 r. 3 p. f. 610
Billericay, Essex.—"The Basildon Estate," 636 a. 0 r. 20 p. f. 4,100

By STANLEY PARKES & BROWN.

Hornsey—343 and 345, Wightman-rd., u.t. 704 yds., g.r. 184, y. r. 724. 650

By THURGOOD & MARTIN.

King's Cross—35, Argyle-st., u.t. 294 yds., g.r. 64, y. r. 504. 455
Gray's Inn-rd.—38, Frederick-st., u.t. 174 yds., g.r. 64, y. r. 554. 355
64, Frederick-st., u.t. 274 yds., g.r. 74, y. r. 544. 345
Notting Hill—98, Hereford-rd., u.t. 454 yds., g.r. 124, y. r. 754. 540
51, Lansdown-rd., u.t. 374 yds., g.r. 44. 8s., a. r. 754. 630
Brixton—14, Hayter-rd., u.t. 614 yds., g.r. 124. 10s., a. r. 504. 320

By WOOTTON & GREEN.

Battersea—Meyrick-rd., l.g. r. 164. 10s., reversion in 63 yrs. 390
Knox-rd., l.g. r. 4. 10s., reversion in 58 yrs. 105
Baywater—Sturveysbury-rd., l.g. rents 404, reversion in 51 yrs. 1,290
Tallbot-rd., l.g. rents 704, reversion in 51 yrs. 2,245
St. Stephen's-sq., l.g. rents 964, reversion in 50 yrs. 3,000
Westbourne Park-rd., The "British Oak" p.h., l.g. r. 604, reversion in 51 yrs. 2,100

By ROBERT NEWMAN (at Cranford).

Cranford, Middlesex—Bath-rd., "Highway Close," 13 a. 0 r. 26 p. f. 850

By SPELMAN'S (at Yarmouth).

Yarmouth, Norfolk—52, Marine-parade, l. subject to Corporation g.r. 14. 17s., y. r. 804. 1,600
4, 5, 6, 7, and 8, Wellington-pl. f., y. r. 714. 700
87 and 95, Albion-rd., l. y. r. 574. 210
83, Lancaster-rd., with blacksmith's shop, l. y. r. 234. 8s. 400

By J. S. HOLLAND (at Masons' Hall Tavern).

Billericay, Essex.—High-st., "The Rising Sun" p.h., c. y. r. 954. 3,000

By RODWELL & SON (at Masons' Hall Tavern).

Croxtley Green, Herts.—The "Artichoke Inn" and 4 a. 2 r. 21 p. f., p. 4,700
An enclosure of land, 2 a. 0 r. 6 p. 300

May 17.—By H. J. BROMLEY.

Forest Hill—77, Devonshire-rd., l. p. 525

By FOSTER & CRANFIELD.

Holloway—Hornsey-rd., l.g. rents 87, reversion in 46 yrs. 960

By WAGSTAFF & SONS.

Highbury—76, Riverside-rd., u.t. 654 yds., g.r. 64, 6s., 304. 435
Caledonian-road—10, Havelock-st., u.t. 50 yds., g.r. 64, w.r. 394. 420
Highbury—Highbury-pk., l.g. r. 804, reversion in 41 yrs. 1,790

By O. P. WHITFIELD.

Spartfields—24, 25, and 26, Steward-st., and 15, Duke-st., area 3,900 ft. l. 3,040

By WOODHEAD & FAYWARD.

Hornsey Rise—437 and 507, Hornsey-rd. (A.), u.t. 804 yds., g.r. 364, y. r. 1704. 2,145

By DEBENHAM, TEWSON & CO., with MATTHEWS & GOODMAN (at Winchester House).

Woolwich, Kent.—Thames-st., l.g. r. 144, reversion in 74 yrs. 1,050
New-rd., the "Pioneer" b.h., l. y. r. 524. 1,850
New-rd., l.g. r. 354, reversion in 69 yrs. 1,850
New-rd., l.g. r. 184, reversion in 234 yrs. 400
Crescent-rd., l.g. rents 774, reversion in 9 to 18 yrs. 5,290
Conduit-rd., l.g. rents 444. 17s. (increasing to 87. 17s.), u.t. 114 to 174 and 674 yds. Frederick-pl., etc., l.g. rents 654. 10s., reversion in 44 to 114 yrs. 8,360
Conduit-rd., l.g. r. 64, reversion in 32 yrs. Raglan-rd., etc., l.g. rents 234, reversion in 144 yrs. 6,260
Conduit-rd., l.g. r. 154, reversion in 8 to 14 yrs. 1,420
Crescent-rd., l.g. rents 774. 8s., reversion in 12 to 154 yrs. 1,260
Bloomfield-rd., l.g. rents 804. 10s., reversion in 144 and 154 yrs. 5,130
Burrage-rd., l.g. rents 734, reversion in 62 to 144 yrs. 5,630
Raglan-rd., etc., l.g. rents 874. 10s., reversion in 144 to 154 yrs. 6,260

Woolwich, Kent.—Burrage-rd., f.g. rents 46l. 8s., reversion in 21 to 22½ yrs.	2,030
Frederick-pl., f.g. rents 23l. 2s. 6d., reversion in 51 to 124 yrs.	2,190
Frederick-pl., f.g. rents 58l., reversion in 41 to 184 yrs.	5,440
Sandy Hill-rd., f.g. rents 46l. 10s., reversion in 24 to 8 yrs.	6,165
St. James-pl., f.g. rents 64l. 13s., reversion in 14½ to 22½ yrs.	5,380
Burrage-rd., f.g. rents 48l. 15s., reversion in 21½ to 30½ yrs.	2,030
Frederick-pl., etc., f.g. rents 36l. 14s., reversion in 13½ to 21½ yrs.	2,640
St. James-pl., f.g. rents 34l. 15s., reversion in 16 to 22 yrs.	1,900
Burrage-rd., f.g. rents 57l. 7s., reversion in 25 to 28 yrs.	2,600
Cambridge-pl., two plots of freehold land.	240
Cambridge-pl., f.g. 9l. 5s., reversion in 19 yrs.	450
Bloomfield-rd., f.g. rents 31l. 17s. 6d., reversion in 16½ to 16½ yrs.	1,720
Bloomfield-rd., f.g. 15l., reversion in 22½ yrs.	940
Bloomfield-rd., f.g. rents 27l. 10s., reversion in 16½ to 18½ yrs.	1,420
Plumstead Common-rd., f.g. 50l., reversion in 14½ yrs.	3,780
Burrage-rd., f.g. rents 43l. 15s., reversion in 26½ to 27½ yrs.	1,970
Cambridge-pl., f.g. 11l. 5s., reversion in 18½ yrs.	420
By WYATT & SON (at Chichester).	
Chichester.—21, Victoria-rd., f.g. 18l.	150
81, Victoria-rd., f.g. 18l.	180
May 18.—By H. C. BIDEN.	
Stockwell.—90, Hargreaves-st., u.t. 60 yrs., g.r. 6l. 10s., w.r. 38l.	250
By C. G. & T. MOORE.	
Whitechapel.—Flumme-rd., f.g. rents 40l., reversion in 84 yrs.	1,000
By NEWBORN, EDWARDS, & SHEPHERD.	
Camden Town.—12, Stratford-pl., u.t. 39 yrs., g.r. 9l., y.r. 42l.	320
Holloway.—25 and 27, Rupert-st., u.t. 61 yrs., g.r. 10l., w.r. 88l. 8s.	410
By OGDEN, SONS, & OLLERY.	
Streatham.—44 and 46, Sunninghill-rd., u.t. 54 yrs., g.r. 4l., y.r. 52l.	665
By ROGERS, CHAPMAN, & THOMAS.	
Pimlico.—46, Hinton-st. (s.), u.t. 19 yrs., g.r. 5l. 6s., y.r. 36l.	535
By R. W. RICHARDSON.	
Muswell Hill.—3, Alexandra Park-rd., u.t. 96 yrs., g.r. 8l., y.r. 38l.	435
By STIMSON & SONS.	
Blackfriars.—1 to 6, 64A and 65, Nelson-sq., area 7,000 ft. l., w.r. 386l.	3,650
Camden Town.—1, The Ter., u.t. 67½ yrs., g.r. 12l., y.r. 120l.	1,000
Streatham.—171, Glenelg-rd., f.g. 42l.	440
Peckham.—13, Oglander-rd., u.t. 70 yrs., g.r. 5l., y.r. 30l.	275
67, Bellenden-rd., f.g. 30l.	490
74, Bellenden-rd., u.t. 73 yrs., g.r. 3l., y.r. 20l.	310
Camberwell.—156, Southampton-st. (s.), f.g. 70l.	1,400
200, Surrey.—1 to 4, Reading-rd., u.t. 92 yrs., g.r. 9l., w.r. 93l. 12s.	500
Harrow, Middx.—12, Gayton-rd., u.t. 70 yrs., g.r. 6l., y.r. 65l.	600
By J. A. & W. THARP.	
Stratford.—Crownfield-rd., f.g. rents 22l. 10s., reversion in 72 yrs.	610
12, 14, 16, and 18, Crownfield-rd., f.g. 136l. 4s.	950
Leyton.—40, High-rd. (s.), u.t. 73 yrs., g.r. 6l. 10s., y.r. 35l.	315
Leytonstone.—Hartley-rd., "Brier Cottage," f.g. 35l.	405
Hartley-rd., two freehold building plots.	210
By G. THORLOPE & SONS.	
Westminster.—24, Abingdon-st., and 4, College-mews, area 3,300 ft. l., y.r. 570l.	14,300
By DANIEL WATNEY & SONS.	
Thornton Heath.—London-rd., freehold building estate, 25 a. 0 r. 14 p.	13,000
By T. B. WESTACOTT.	
Highgate.—81, Harborton-rd., u.t. 83 yrs., g.r. 6l. 10s., e.r. 45l.	380
By WETHERALL & GREEN (at Ealing).	
Ealing.—23, Eaton-rise, u.t. 61½ yrs., g.r. 8l. 8s., y.r. 47l.	450
May 10.—By CRAFTS, HARRIS, & CO.	
Blackfriars.—65 and 66, Brunswick-st., f.g. w.r. 104l.	955
By FORTESCUE & CO.	
Streatham.—34 and 36, Sternhold-av., u.t. 80½ yrs., g.r. 18l., e.r. 90l.	700
Norbury.—17 and 19, Norbury-gdns., u.t. 97 yrs., g.r. 18l. 10s., e.r. 70l.	500
New Malden, Surrey.—1, Somerset-villas, f.g. y.r. 28l.	390
By FORBES.	
St. John's Wood.—23 and 24, Elm Tree-rd., and 18, Grove End-rd., u.t. 12½ yrs., g.r. 16l. 15s., y.r. 110l.	610
Paddington.—44, Brindley-st., u.t. 39½ yrs., g.r. 5l., w.r. 46l. 16s.	200
By LESLIE, MARSH, & CO.	
Kensington.—5 and 8, Russell-gdns.-mews, f.g. y.r. 75l.	830
36, Addison-gdns., f.g. y.r. 75l.	1,010
By NICHOLAS, DENYER, & CO.	
Rotherfield Peppard, Oxon.—Freehold riverside building site.	700
By RAMSAY, WAINWRIGHT, & CO.	
Bowes Park.—7, Carlton-rd., u.t. 76 yrs., g.r. 5l. 5s., w.r. 33l. 16s.	225
By RIDER & SONS.	
Fulham.—43, Claybrooke-rd., u.t. 48½ yrs., g.r. 7l., w.r. 33l. 16s.	220
21 to 29 (odd), Rylston-rd., u.t. 4½ yrs., g.r. 5l., w.r. 101l. 8s.	485

Holloway.—123, Hornsey-rd., u.t. 33½ yrs., g.r. 6l. 6s., y.r. 80l.	2,330
Tottenham.—69, Fleva-rd., u.t. 60 yrs., g.r. 5l., y.r. 24l.	200
Dulwich.—9, Ashbourne-gr., u.t. 65 yrs., g.r. 6l., e.r. 32l.	280
Clerkenwell.—2, Wharton-st., u.t. 21½ yrs., g.r. 4l., y.r. 45l.	300
Barnes.—5, Laurel-rd., u.t. 97 yrs., g.r. 9l., y.r. 52l.	460
Ilford.—w.r. 28l. 12s., u.t. 95 yrs., g.r. 5l. 5s., e.r. 24l. 14s.	215
20, Howard-rd., u.t. 96 yrs., g.r. 4l. 10s., e.r. 24l. 14s.	100
Contractions used in these lists.—F.g. for freehold ground-rent; l.g. for leasehold ground-rent; r. for rent; i. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; h.h. for hearth; p.h. for public-house; o. for offices; s. for shops; ct. for court.	

MEETINGS.

FRIDAY, MAY 26.	
Royal Institution.—Professor Julius W. Brühl on "The Development of Spectro-Chemistry." 9 p.m.	
SATURDAY, MAY 27.	
Institute of Sanitary Engineers.—Visit to the Municipal Works at New Malden. Train leaves Waterloo Station at 2.2 p.m., arriving at Coombe and Malden Station at 2.33 p.m.	
MONDAY, MAY 29.	
Surveyors' Institution.—Annual General Meeting to receive the Report of the Council and the announcement of the result of the Election of Officers for the ensuing year. 3 p.m.	
TUESDAY, MAY 30.	
Royal Institution.—The Rev. H. G. Woods, D.D., on "Velazquez: the Court Portrait Painter." 11. 5 p.m.	
THURSDAY, JUNE 1.	
Royal Institution.—Professor J. A. Fleming, M.A., on "Electro-magnetic Waves." 11. 5 p.m.	
SATURDAY, JUNE 3.	
Royal Institution.—Mr. A. H. Savage Landor on "Exploration in the Philippines." 11. 5 p.m.	
Northern Architectural Association.—Visit to Whitley Schools, St. George's Church, Cullercoats, and Tyne-mouth Priory, etc.	

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom and to the Colonies, Australia, New Zealand, India, China, Ceylon, &c., for 10s. per annum. Remittances payable to the Editor should be addressed to the Publisher of "THE BUILDER," Catherine-street, W.C.

SUBSCRIBERS IN LONDON AND THE SUBURBS, by prepaying at the Publishing Office 10s. per annum (39 numbers) or 4s. 6d. per quarter (13 numbers), can ensure receiving "The Builder" by Friday Morning's Post.

PRICES CURRENT OF MATERIALS.

* Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.	
Hard Stocks	1 10 0 per 1000 alongside, in river.
Rough Stocks and Grizzles	1 6 6
Facing Stocks	2 2 0
Shippers	2 2 0
Flettons	1 7 0 at railway dep't.
Red Wire Cuts	1 14 0
Best Fareham Red	3 12 0
Best Red Pressed	
Ruabon Facing	5 0 0
Best Blue Pressed	4 2 6
Do. Bullnose	4 7 6
Best Stourbridge Fire Bricks	4 0 0
GLAZED BRICKS.	
Best White and Ivory	
Stretchers	12 0 0
Headers	11 0 0
Quoins, Bullnose, and Flats	16 0 0
Double Stretchers	16 0 0
Double Headers	16 0 0
One Side and two Ends	19 0 0
Two Sides and one End	20 0 0
Plays, Chamfered, Squints	30 0 0
Best Dipped Salt Glazed Stretchers, and Headers	12 0 0
Quoins, Bullnose, and Flats	14 0 0
Double Stretchers	15 0 0
Double Headers	14 0 0
One Side and two Ends	15 0 0
Two Sides and one End	15 0 0
Plays, Chamfered, Squints	14 0 0
White and Dipped Salt Glazed	2 0 0 less than best.

BRICKS, &c. (continued).

Thames and Pit Sand	7 0 per yard, delivered.
Thames Ballast	27 0 per ton.
Best Portland Cement	27 0 per ton.
Best Ground Blue Lias Lime	20 0
NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.	
Grey Stone	12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks	37s. 6d. per ton at r.r. depot.
STONE.	
BATH STONE.—delivered on road waggons, Paddington Depot	1 4 per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depot	1 4
PORTLAND STONE (20 ft. average).—Brown Whitbed, delivered on road waggons, Paddington Depot, Nine Elms Depot, or Pimlico Wharf	2 1
White Banded, delivered on road waggons, Paddington Depot, Nine Elms Depot, or Pimlico Wharf	2 1
Ancester in blocks	1 1 per ft. cube, delivered to depot.
Beaer	1 6
Greenhill	1 10
Darley Dale in blocks	2 4
Best Cornhill	2 5
Clochem Red Freestone	2 0
Red Mansfield	2 4
YORK STONE.—Robt. Hood Quality. Scalloped random blocks	3 10
6 in. sawn two sides landings to sizes (under 40 ft. super)	2 3 per ft. super.
6 in. rubbed two sides ditto, ditto	2 6
3 in. sawn two sides slabs (random sizes)	0 11½
3 in. to 2½ in. sawn one side slabs (random sizes)	0 7½
1½ in. to 1 in. ditto, ditto	0 6
YORK STONE.—Scalloped random blocks	3 0 per ft. cube.
6 in. sawn two sides landings to sizes (under 40 ft. super)	2 8 per ft. super.
6 in. rubbed two sides ditto	3 0
3 in. sawn two sides slabs (random sizes)	1 2
3 in. self-faced random flags	0 5
Hopton Wood (Hard Bed) in blocks	3 0 per ft. cube, delivered to depot.
6 in. sawn both sides landings	2 7 per ft. super, delivered to depot.
3 in. sawn both sides random slabs	1 1
2 in. do. do.	0 9½
SLATES.	
in. in.	8 d.
20 x 10 best Blue Bangor	3 6 per 1000 of 1800 sq. ft.
20 x 12	19 17 6
20 x 10 first quality	18 0 0
20 x 12	18 15 0
20 x 10 best Blue Portmadoc	12 12 6
16 x 8	6 12 6
20 x 10 best Eureka unfading green	15 17 6
20 x 12	18 7 6
18 x 10	13 5 0
16 x 8	10 5 0
20 x 10 permanent green	11 12 6
18 x 10	11 12 6
16 x 8	6 12 6
TILES.	
Best plain red roofing tiles	42 0 per 1000 at r.r. depot.
Hip and Valley tiles	8 7 per doz.
Best Broseley tiles	50 0 per 1000
Do. Ornamental tiles	32 6
Hip and Valley tiles	4 0 per doz.
Best Ruabon red, brown, or brindled do. (Edwards)	6 per 1000
Do. Ornamental do.	60 0
Hip tiles	4 0 per doz.
Valley tiles	3 0
Best Red or Mottled Staffordshire do. (Faulkner)	51 8 per 1000
Do. Ornamental do.	54 6
Hip tiles	4 1 per doz.
Valley tiles	3 8
Best "Rosemary" brand plain tiles	48 0 per 1000
Best Ornamental tiles	50 0 per doz.
Hip tiles	3 8
Valley tiles	3 8
Best "Hartshill" brand plain tiles, and faced	50 0 per 1000
Do. pressed	47 6
Do. Ornamental do.	50 0
Hip tiles	4 0 per doz.
Valley tiles	3 6
WOOD.	
Deal: best 3 in. by 11 in. and 4 in. & 4 in. by 9 in. and 11 in.	13 0 0
Deal: best 3 by 9	13 0 0
Battens: best 3 in. by 7 in. and 3 in. by 5 in. and 3 in. by 7 in. and 3 in. by 5 in.	11 0 0
Battens: best 2½ by 6 and 3 by 6	10 0 0
Deal: seconds	1 0 0
Battens: seconds	9 0 0
2 in. by 4 in. and 2 in. by 3 in.	8 0 0
Foreign Sawn Boards—1 in. and 1½ in. by 7 in.	0 10 0
3 in.	1 0 0

WOOD (continued).

	At per load of 50 ft.	
Best mauling (average)	4 10 0	5 0 0
Second yellow deals, 3 in. by 11 in.	4 0 0	4 10 0
Third yellow deals, 3 in. by 11 in.	3 12 6	3 15 0
Fourth yellow deals, 3 in. by 11 in.	3 0 0	3 10 0
Small timber (30 ft. average)	3 5 0	3 15 0

WOOD.

	At per standard.	
First yellow deals, 3 in. by 11 in.	24 0 0	25 0 0
Second yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
Third yellow deals, 3 in. by 11 in.	16 10 0	18 0 0
Fourth yellow deals, 3 in. by 11 in.	18 10 0	20 0 0
Small timber (30 ft. average)	13 10 0	14 10 0
First yellow deals, 3 in. by 11 in.	13 10 0	15 0 0
Second yellow deals, 3 in. by 11 in.	11 0 0	12 0 0
Third yellow deals, 3 in. by 11 in.	10 0 0	11 0 0
Fourth yellow deals, 3 in. by 11 in.	10 0 0	11 0 0
Small timber (30 ft. average)	10 0 0	11 0 0

JOISTS, GIRDERS, &c.

	In London, or delivered	
Best mauling (average)	4 10 0	5 0 0
Second yellow deals, 3 in. by 11 in.	4 0 0	4 10 0
Third yellow deals, 3 in. by 11 in.	3 12 6	3 15 0
Fourth yellow deals, 3 in. by 11 in.	3 0 0	3 10 0
Small timber (30 ft. average)	3 5 0	3 15 0

METALS.

	Per ton, in London.	
Best mauling (average)	4 10 0	5 0 0
Second yellow deals, 3 in. by 11 in.	4 0 0	4 10 0
Third yellow deals, 3 in. by 11 in.	3 12 6	3 15 0
Fourth yellow deals, 3 in. by 11 in.	3 0 0	3 10 0
Small timber (30 ft. average)	3 5 0	3 15 0

LEAD, &c.

	Per ton, in London.	
Best mauling (average)	4 10 0	5 0 0
Second yellow deals, 3 in. by 11 in.	4 0 0	4 10 0
Third yellow deals, 3 in. by 11 in.	3 12 6	3 15 0
Fourth yellow deals, 3 in. by 11 in.	3 0 0	3 10 0
Small timber (30 ft. average)	3 5 0	3 15 0

ENGLISH SHEET GLASS IN CRATES.

	23d. per ft. delivered.	
15 oz. thirds	23d.	24d.
21 oz. thirds	23d.	24d.
26 oz. thirds	23d.	24d.
32 oz. thirds	23d.	24d.
Fluted Sheet, 15 oz.	23d.	24d.
Harley's Royal Plate	23d.	24d.
Stockholm Tar	23d.	24d.

OILS, &c.

	Per gallon.	
Best mauling (average)	4 10 0	5 0 0
Second yellow deals, 3 in. by 11 in.	4 0 0	4 10 0
Third yellow deals, 3 in. by 11 in.	3 12 6	3 15 0
Fourth yellow deals, 3 in. by 11 in.	3 0 0	3 10 0
Small timber (30 ft. average)	3 5 0	3 15 0

VARNISHES, &c.

	Per gallon.	
Best mauling (average)	4 10 0	5 0 0
Second yellow deals, 3 in. by 11 in.	4 0 0	4 10 0
Third yellow deals, 3 in. by 11 in.	3 12 6	3 15 0
Fourth yellow deals, 3 in. by 11 in.	3 0 0	3 10 0
Small timber (30 ft. average)	3 5 0	3 15 0

PUBLISHER'S NOTICES.

THE INDEX (with TITLE-PAGE) for VOLUME LXXXVII (July to December, 1904) was given as a supplement with the issue for January 1905.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each.

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Advertisements for the current week's issue are received up to THREE O'CLOCK P.M. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE P.M. on that day. Those intended for the Guide Wrapper should be in by TWELVE NOON on WEDNESDAY.

ALTERATIONS IN STANDING ADVERTISEMENTS OR ORDERS TO DISCONTINUE same must reach the Office before TEN O'CLOCK on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS advertising in "THE BUILDER" may have Replies addressed to the Office, Catherine Street, Covent Garden, W.C., free of charge. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES NINEPENCE EACH.

(By post (carefully packed) 1s.)

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursday, (N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100l., unless in some exceptional cases and for special reasons.)

* Denotes accepted. † Denotes provisionally accepted.

ABERDEEN.—For additions to coal stores in Palmerston-road, for the Northern Co-operative Co., Ltd. Mr. J. Milne, architect, 254, Union-street, Aberdeen.

Mason: D. Weir, Claremont-street, Aberdeen.

Carpenters: W. Blisset & Co., Caltonian-place, Aberdeen.

Plumber: R. Malcolm, Fowle-terrace, Aberdeen.

Sister: J. Wilson, Crooked-lane, Aberdeen.

Iron: Redpath, Brown, & Co., Edinburgh.

ASPATRIA.—For the reconstruction of overflow weir, the enlargement of a portion of the by-wash channel, and the fixing of a wash-out sluice, at their Chapel House reservoir, for the Aspatria, Silloth, and District Joint Water Board. Mr. C. B. Newton, engineer, J. Laing & Son, 2569 0 Messingate.... 2484 18

BOSTON (Lincolnshire).—For laundry fittings, machinery, engine, and boiler at the workhouse, for the Guardians. Mr. J. Rowell, architect, Church-lane, Boston.

Goddard, Massey, & Warner, Ltd., Nottingham.... 2901 16 6

BOSTON (Lincolnshire).—For heating the infirmary buildings, for the Guardians. Mr. J. Rowell, architect, Church-lane, Boston.

Lancashire Heating Co., 34, Temple-court, Birmingham.... 2405

BOSTON (Lincolnshire).—For erecting a new infirmary laundry, boiler house, and mortuary at the workhouse, for the Guardians. Mr. J. Rowell, architect, Church-lane, Boston.

F. Parker, Norfolk-street, Boston.... 25,995

BRISTOL.—For painting, cleaning, and other work at Arley Congregational Chapel, Cheltenham-road, for the Deacons and Trustees of Arley Congregational Chapel. Mr. A. Harford, architect and surveyor, 9 and 7, St. Stephen-street, Bristol.

E. B. Derrick, 2523 13 0 F. A. R. Wood.

S. Barrett & Ward.... 2162 6 8

J. E. Beavis, 157 15 0

Cottrell Bros., 198 0 0 J. F. Darrat

R. F. Ridd, 198 0 0 Bros., 145 10 0

C. Broadbent, 185 0 0 F. W. Waters

J. E. B. James, 155 0 0 Lawrence-hill

E. Walters & Bristol.... 127 0 0

Son, 178 0 0 S. Williams & Sons.... 109 0 0

Hot-Water Heating Apparatus and System.

J. & F. Dark Bros., Easton Hill, Bristol.... 2120

CARMARTHEN (South Wales).—For restoration of No. 3, Spilman-street, for Jesus College, Oxford. Mr. R. England, Estates Surveyor for Jesus College.

T. Morris, Carmarthen.... 2398 10

CHADWELL HEATH.—For erecting a temporary shelter in connexion with Ilford Isolation Hospital at Grove-road, for the Ilford Urban District Council. Mr. H. Shaw, Engineer and Surveyor, Town Hall, Ilford.

F. & A. Willmott, The Hill, Ilford.... 21,239

COEDPENMAEN.—For alterations and additions to the girls' and infants' departments at Coedpenmaen School, for the Pontypridd Urban District Council. Mr. P. R. A. Willoughby, Surveyor to Council.

W. Davies, 21,837 0 0

Williams & James, 1,550 0 0

M. Griffiths, Pontypridd.... 1,451 10 10

CROSSNESS.—For dredging Crossness outfall, for the London County Council.

C. H. Campbell, 45,500

British Dredging Co. Ltd., 4,095

S. Williams & Sons, Ltd., 4,500

Flower & Everett, 4,500

M. C. Read, 2,850

DEVONPORT.—For building stables at rear of 28, Trafalgar-place, Stoke, Devonport, for Mr. Hawken.

Mr. F. M. Leese, architect.

F. Watts, 2179 15

S. Perkins, 179 10

H. Pils & Son, 143 10

DEVONPORT.—For rebuilding the Stoke Inn and adjoining premises, Tavistock road, Stoke, Devonport, for Mr. Ralph.

Mr. H. M. Leese, architect. Messrs. Leese & Adams, quantity surveyors.

H. Pile & Son, 22,209 10

 G. H. Smith & Son, 1,965 15 | W. Littleton & Son, 21,896 0 | Pearce Bros., 1,658 0 |

EASTLEIGH (Hants).—For erecting a Baptist chapel. Messrs. J. Wills & Sons, architects, Victoria-chambers, Derby.

Golding & Ansell, Southampton.... 23,118 10 2

EDMONTON.—For erecting buildings for stores at the rear of the Town Hall, for the Urban District Council. Mr. H. W. Dobb, Architect, Town Hall, Lower Edmonton.

A. Forster, 2391 0 0

J. Thomas, 286 0 0

A. Wallis, 280 2 8

J. Groves & Sons, 219 0 0

M. C. Read, 217 19 0

A. G. Chrisp, Walthamstow.... 188 0 0

TENDERS.—Continued on page 585.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Drawings to be Delivered.
*New Free Public Library	Hove Corporation	50l., 30l., and 20l.	Aug. 1
*System of Waterworks and Canalisation, Croatia	Burgomaster of Karlstadt	Not stated	See 11.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Drawings to be Delivered.
Road Metal	Stratford-on-Avon Town Council	R. Dixon, Borough Surveyor, Municipal Offices, Stratford-on-Avon	May 27
Blackswell Hall	Committee	J. Wilson, Blackswell, Ireland	May 27
Additions, Casarau and Spillers Co-operative Stores	Trustees	Evans & Jones, Architects & Surveyors, 4, Trinity-pl., Swansea	May 27
120 fathoms of Swedish Board Ends	Kingston Guardians	J. Edgell, Union Offices, Coombe-road, Kingston-on-Thames	May 27
Asphalt. Yds., etc. Train Inst., Hartley-rd., N. Ham.	West Riding C.C.	Poor Law Office, Nottingham	May 27
Heating and Ventilation, Storthes Hall Asylum	East Ham Corporation	J. Vickers-Edwards, County Architect, County Hall, Wakefield	May 27
Painting of Corrugated Iron Hospital, Roman-road	Bootle Corporation	E. H. Campbell, Borough Engineer, Town Hall, East Ham, E.	May 27
Private Improvement Works	Bolton Corporation	Borough Engineer's Office, Bootle	May 27
Reconstruction of Coal Intersecting Sewer	do.	E. L. Morgan, Borough Engineer, Town Hall, Bolton	May 27
Reconstruction of Croft & Tonge Intersecting Sewer	do.	do.	May 27
Ironwork in Bridges crossing the Croft	do.	do.	May 27
40 ft. Spans, Switches, and Crossings	Secretary of State for India	Director-General of Stores, India Office, Whitehall, S.W.	May 27
Painting on Malton and Driffield Branch	N.E.Ry. Co.	H. J. Rudgard, District Engineer, York	May 27
280 tons of Broken Whinstone or Granite	Pontefract Corporation	J. E. Pickard, Borough Surveyor, Municipal Offices, Pontefract	May 27
600 tons of Broken Dross	do.	do.	May 27
Street Works, Llanbadrach	Casertilly U.D.C.	A. O. Harper, Surveyor, Council Offices, Casertilly	May 27
Extension of Sewer, Shenley-road, Radlett	Watford B.D.C.	E. Lalle, Engineer, 9, Market-street, Watford	May 27
Alters to Mill Race, etc., Greenvale Mills, Kilkenny	Irish U.D.C.	Manager, Kilkenny Woollen Mills, The Parade, Kilkenny	May 27
Road Materials	Distillers Co., Ltd.	J. Cooke, Clerk, Irish	May 27
Hoppers and Mechanical Malt-Handling Appliances	Manchester Education Committee	Offices in Deansgate, Manchester	May 27
Terra-Cotta for Seymour-road School, Clayton	Hammersmith Borough Council	Borough Surveyor, Town Hall, Hammersmith, W.	May 27
Road Works, Oswaldtwistle, Lancs.	East India Railway Co.	C. W. Young, Secretary, Nicholas-lane, London, E.C.	May 27
Excavating 4,000 cub. yds. Shale and Rock, Kingston	Carlisle United Assoc. Football Club	H. Foxall, Architect, Carlisle	May 27
Four Tenements of Dwelling-houses, Bridgeton	do.	do.	May 27
Reconstruction of Offices	Hemsworth R.D.C.	J. Schofield, Clerk, Hemsworth, near Wakefield	May 27
Electric Passenger Lift, Council Offices, Castle-terrace	Plymouth Education Authority	E. C. Cook, 18, Princess-square, Plymouth	May 27
Dwelling-houses, Grand-street, Burghhead	do.	do.	May 27
9,000 sq. yds. Permanent Paving	Glasgow Corporation	Jackson & Fox, Architects, 7, Rayson-street, Halifax	May 27
Electric Passenger Lift, Council Offices, Castle-terrace	Edinburgh Parish Council	R. M. Cameron, Architect, 53, Great King-street, Edinburgh	May 27
100 tons of 27-in. Cast-Iron Pipe Sewer	do.	do.	May 27
Removing Brick Sewer and Laying Cast-Iron Pipes	Watford U.D.C.	J. Jamieson, Architect, 77, High-street, Elgin	May 27
Making-up and Laying Pitch	Highway and Drainage Committee	H. M. Turner, Clerk, Council Offices, 14, High-street, Watford	May 27
Small School-house, Killinonan	West Bromwich Corporation	D. Waterhouse, Surveyor, Council Offices, 14, High-st., Watford	May 27
School, Lydgate-lane, Crookes	do.	R. N. Hunter, Surveyor, Town Hall, Oswaldtwistle	May 27
Work at Appleton Roebuck New Schl., nr. Tadcaster	Enfield U.D.C.	A. D. Greston, Borough Engineer, Town Hall, West Bromwich	May 27
Work at Brierley, Grimethorpe School, near York	Kilneshannoch School Board	do.	May 27
Work at Cornthorpe School, near York	Sheffield Education Committee	B. Collins, Surveyor, Public Offices, Enfield	May 27
Work at Golear Crow-lane School, near Huddersfield	West Riding C.C. Education Com.	W. Bell, Architect, Aberfeldy	May 27
Work at Golear Knowl Bank School, nr. Huddersfield	do.	W. J. Hals, Architect, 3, St. James'-row, Sheffield	May 27
Work at Golear Wellhouse School, nr. Huddersfield	do.	do.	May 27
Work at Linthwaite Central School, nr. Huddersfield	do.	do.	May 27
Work at Stanley and Outwood School, nr. Wakefield	do.	do.	May 27
Work at Swinfield School, near Golear	do.	do.	May 27
Work at Wheatley Provided School, near Doncaster	do.	do.	May 27
Work at Worsborough Birdwell School, nr. Barnsley	do.	do.	May 27
Work at Worsborough Blacker School, nr. Barnsley	do.	do.	May 27
Work at Worsborough Common Provided School	do.	do.	May 27
Work at Yeadon School, near Bradford	do.	do.	May 27
Street Paving	Gateshead Corporation	N. P. Patinson, Borough Engineer, Town Hall, Gateshead	May 27
Flints	Greenwich Borough Council	Borough Engineer, Town Hall, Greenwich, S.E.	May 27
Warehouse at Cardow Distillery, Strathspay	Blaydon U.D.C.	W. Pearson, Engineer, Bath-chambers, Aspatia	May 27
Sewers in Conventmore-road, etc., Bramhall	do.	R. Higgins, Sanitary Inspector, Council Offices, Blaydon	May 27
Additions, etc., to Farm Buildings at Wester Kintore	Hazelgrove U.D.C.	W. Bellon Roe, Architect, 3, Dumfries-place, Cardf.	May 27
Additions, etc., to Farm Bldgs., Truxes and Veehill	do.	C. C. Dalg, Architect, Elgin	May 27
Alterations, etc., to Farm Bldgs., Homehead, Sully	do.	G. S. Doncaster, Surveyor, Council Offices, Hazelgrove, Cardf.	May 27
Extension of Water Main to Allonby and Hayton	do.	J. Willet, Architect, Elgin	May 27
Heating Apparatus in Newgate Schools	Hon. Ivor C. Guest, M.P.	do.	May 27
Additions and Alterations to Farmhouse, Welter Colfield	Aspatia, etc. Water Board	J. L. Lambert, Surveyor, Prudential-buildings, Bridgend	May 27
*Renovating Hall and Institute	Mansfield Education Committee	W. Pearson, Engineer, Bath-chambers, Aspatia	May 27
Sewerage Works, Ellesmere-road	do.	C. C. Dalg, Architect, Elgin	May 27
Colliery Timber	South Bermondsey Club, etc.	Steward, Rotherhithe New-road, S.E.	May 27
Colliery Timber	South Hutton Coal Co., Ltd.	R. Wilda, Engineer, Council Offices, Walton-on-Thames	May 27
Alterations, etc., to Farm Bldgs., Homehead, Sully	Carrickfergus U.D.C.	J. R. Lambert, South Hutton, near Sunderland	May 27
Extension of Water Main to Allonby and Hayton	Rev. R. Williams, M.A.	W. D. R. Taggart, Architect, Scottish Provident-buildings, Belfast	May 27
Heating Apparatus in Newgate Schools	Lancashire Education Committee	D. Jenkins, F.R.I.B.A., Llandilo	May 27
Additions and Alterations to Farmhouse, Welter Colfield	Manchester Tramways Committee	Plegg & Thorp, Architects, 41, Corporation-street, Manchester	May 27
*Renovating Hall and Institute	Walter Scott, Ltd.	J. M. Elroy, 55, Piccadilly, Manchester	May 27
Sewerage Works, Ellesmere-road	Glasgow Quarter Sessions and C.C.	Storekeeper, Trinidad Grange Colliery	May 27
Colliery Timber	The Corporation	T. M. Franklin, Glasgow C.C. Offices, Westgate-street, Cardiff	May 27
Alterations, etc., to Farm Bldgs., Homehead, Sully	Consett Iron Co.	C. Young, 141, West George-street, Glasgow	May 27
Extension of Water Main to Allonby and Hayton	do.	C. E. Oliver, General Offices, Consett, Co. Durham	May 27
Heating Apparatus in Newgate Schools	Irish Education Committee	Bishop & Cantley, Architects, 32, Museum-street, Ipswich	May 27
Additions and Alterations to Farmhouse, Welter Colfield	Ebbw Vale U.D.C.	T. J. Thomas, Town Surveyor, Ebbw Vale	May 27
*Renovating Hall and Institute	Leicester Markets Committee	E. G. Mawbey, Borough Surveyor, Town Hall, Leicester	May 27
Sewerage Works, Ellesmere-road	Glasgow Corporation	W. W. Lackie, Electrical Engineer, 78, Waterloo-street, Glasgow	May 27
Colliery Timber	Mr. W. Wilkins	W. Hall, Post Office, Prudhoe	May 27
Alterations, etc., to Farm Bldgs., Homehead, Sully	Sittingham Water Committee	Water Engineer, St. Peter's-square, Nottingham	May 27
Extension of Water Main to Allonby and Hayton	do.	J. Barbour & Bowie, Architects, Dumfries, N.B.	May 27
Heating Apparatus in Newgate Schools	Basford R.D.C.	G. W. Hawley, Burton-buildings, Parliament-street, Nottingham	May 27
Additions and Alterations to Farmhouse, Welter Colfield	do.	do.	May 27

By whom Advertised.

Forms of Tender, etc., supplied by

Tenders to
be Delivered

[illegible]

Nature of Appointment.

By whom Advertised.

Salary.

Application
to be in

		Salary.	to be in
Natural Assistant.	Birkenhead Corporation.....	150% per annum	June 8
Prof. Assistant (Arch. and Building Trades' Dept.).	Northern Polytechnic Institute....	125% per annum	do.
Prof. Assistant (Mechanical Engineering Department)	do.	160% per annum	19.

Those marked with an (*) are advertised in this number.

Competitions, iv.

Contracts, iv, vi, viii, x.

Public Appointments. xviii.

TENDERS.—Continued from page 583.

HEAT BADDOW.—For seven cottages, Beehive-
Great Baddow. Mr. R. Mawhood, architect,
London:—

Mr. & Sons	£1,898	F. Cracknell, Great	—
Payne.....	1,695	Baddow*	£1,565
Others	1,575		

7,700D.—For forming new filter beds and providing filter material at the Outfall Works, Waterworks, for the Urban District Council. Mr. H. Shaw, Engineer to the Council, Town Hall, Ilford:—
J. Jackson, 106, Ripple-road, Barking* £9,660 12 11

EBBESBOROUGH.—For constructing an iron
 bridge under the river Nidd, for the Rural District
 Council of Knaresborough. Mr. W. S. Lupton, Sur-
 veyor. Quantities by Surveyor:—

Simpson 2674	18	6	Messrs. Leed-
ham &			ham & Co.,
Shore	118	1	New Park,
Long	316	18	Harrogate*,
Robt Harvey	280	7	£244 18 6

LONDON.—For the reconstruction of a urinal in
 Brick-street, Pimlico, for the Westminster City
 Council:—
 H. Doulton & Co.*..... £150

UNION.—For the erection of a new police-station
 "Kings Hill. Mr. J. Dixon Butler, Architect, Sur-
 veyed the Metropolitan Police, New Scotland Yard,
 quantities by Messrs. Thurgood, Son, & Childgey,
 and Cross-chambers, Duke-street, Adelphi:—

400 of Lightfoot	£12,849	Aldin Bros.....	£11,973
200 of Co.	12,700	Spencer & Co.....	11,947
200 of Co.	12,676	Mowlem & Co.....	11,938
200 of Co.	12,649	Asby & Horner	11,850
200 of Co.	12,330	Grover & Son.....	11,784
200 of Co.	12,246	Lawrance & Son.....	11,675
200 of Co.	12,160	Leslie & Co.....	11,305
200 of Co.	11,997		

LONDON.—For accumulators, Greenwich electricity generating station, for the London County Council:—

	Supply, delivery, and erection.	Mainten- ance.
Tudor Accumulator Co., Ltd., London*.....	£1,875 12 0	£1,120 0 0
British Accumulator Co., Ltd.	1,947 10 0	1,900 0 0
Electric Power Storage Co., Ltd.	2,108 18 0	50 0 0
D. E. Battery Co., Ltd.	2,173 0 0	1 3 0
Chloride Electrical Storage Co., Ltd.	2,177 0 0	1,170 0 0
Accumulator Industries, Ltd.	2,371 2 4	1,045 0 0
H. P. Accumulator Co., Ltd.	2,755 11 0	2,000 0 0
Hart Accumulator Co., Ltd.	3,447 6 0	2,885 10 0

LONDON.—For the supply of stoneware ducts for electric cables, for the London County Council:—

	Rate per 1,000 ducts.	Amount of tender (for 750,000 ducts, including full contingencies provision).	Delivery per week
	£ s. d.	£ s. d.	
G. Skoy & Co. Ltd. London**	11 19 6	9,481 5 0	5,000
Stanley Bros., Ltd., Newcastle†	12 0 0	10,260 0 0	10,000
Stourbridge Glazed Brick and Fireclay Co., Ltd.	14 10 0	3,791 13 4	4,000
		(for 250,000 ducts only)	
J. Knowles & Co.	14 11 8	11,437 10 0	5,000
H. R. Mansfield	14 11 8	11,437 10 0	5,000
Thomas Turley & Co., Ltd.	14 11 8	11,437 10 0	5,000
T. Wraggs & Son, Ltd.	14 11 8	11,437 10 0	60,000
Sutton & Co.	16 13 0	12,587 10 0	5,000
Ingham's Firebrick Co.	16 18 6	13,163 15 0	10,000
J. F. Cummings & Co.	21 0 0	16,280 0 0	75,000
Navor Bros.	24 0 0	18,500 0 0	10,000
J. J. Lee			

‡ 500,000. § 250,000.

LONDON.—For painting, distemping, and general repairs, etc., at the Infirmary, Fulham-road, for the St. George's Guardians. Mr. A. H. Newman, clerk of works:—

J. J. Richards, 9, Shannon-grove, Brixton* £625

LONDON.—For overhead travelling cranes, Streatham, Battersea, and Wandsworth sub-stations, for the London County Council:—

Butters Bros. & Co.	£2,385 0
Dougill's Engineering, Ltd.	1,770 0
Cowans, Sheldon, & Co., Ltd.	1,290 0
Parsons, Brierley Hill, Ltd.	1,375 0
Rawlinsons, Ltd.	1,225 0
Steel Rope Pulley Locomotive Co., Ltd.	1,192 0
Flavel & Churchill	1,180 0
T. Smith & Sons	1,128 0
Leeds Engineering and Hydraulic Co., Ltd.	1,085 0
T. Larmuth & Co.	1,025 0
J. Booth & Bros., Ltd.	990 0
J. M. Henderson & Co.	980 0
Pickering's, Ltd.	927 10
J. Spencer & Co.	915 0
Ransomes & Rapier, Ltd.	909 0
Tangways, Ltd.	871 0
C. & A. Musker (1901), Ltd.	810 0
J. Hitchon & Son, Ltd. §.	760 0
Rodgers & Kaye	740 0
Holt & Willett	725 0
J. Smith (Kelghley), Ltd.	699 0
J. Carrick & Sons, Ltd. §.	680 0
Carrick & Ritchie, Edinburgh*	761 0
J. Gibb & Co., Ltd.	678 0
Jesop & Appleby Bros. (Leicester & London), Ltd.	661 0
Herbert Morris, & Bastard, Ltd.	620 0
Herbert Morris, & Bastard, Ltd.	477 8

† Not to specification. § Alternative.

LONDON.—For the erection of a disinfecting station at Wood-lane depot, for the Kensington Borough Council. Mr. W. Weaver, Borough Engineer and Surveyor, Town Hall, High-street, Kensington:—

	If with Gazed Bricks Externally.	If with Red Pressed Bricks Externally.
Cunningham, Forbes & Co.	£7,131 15 4	£7,707 19 2
J. Barker & Co., Ltd.	6,002 0 0	5,566 0 0
H. Haynes	5,096 1 9	5,544 7 4
J. Wright	5,460 10 0	5,000 0 0
Palman & Polhar-ingham, Ltd.	5,223 0 0	4,773 0 0
W. King & Son	5,135 0 0	4,863 0 0
W. Wallis	5,105 0 0	4,802 0 0
Higgs & Hill, Ltd.	4,994 0 0	4,594 0 0
F. Wolsten	4,993 13 8	4,698 7 9
Mattock & Parsons	4,992 0 0	4,583 0 0
Kirk & Randall, J. Mowlem & Co., Ltd.	4,987 0 0	4,627 0 0
R. Dean & Co.	4,950 0 0	4,640 0 0
L. F. Lamplough	4,900 0 0	4,526 0 0
C. Denting & Son	4,822 15 1	4,446 5 6
Martin, Wells, & Co.	4,865 0 0	4,550 0 0
T. Bendon	4,775 0 0	4,445 0 0
W. Lawrence & Son	4,773 0 0	4,354 0 0
A. Hudson & Co.	4,727 0 0	4,456 0 0

NORWICH.—For alterations and additions and part taking down and rebuilding premises, 47, St. Giles-street. Mr. A. C. Bavers, architect, 1, Bank-place, Norwich. Quantities by architect:—

J. S. Smith	£2,700	J. Evans	£2,455
J. Boddy & Son	2,516	J. Youngs & Son*	2,435
J. Anderson & Son	2,487	H. G. Greengrass	2,400
R. Daws & Son	2,489	A. E. Chapman	2,399
Scarles Bros.	2,465	T. Gill	2,397

[All of Norwich.]

NORWICH.—For proposed restoration of tower, Church of St. Gregory, Norwich. Mr. H. J. Green, architect and Diocesan Surveyor, 31, Castle-meadow, Norwich:—

J. Youngs & Sons	£223 0 0	A. W. Hall	£845 4 2
G. E. Hawes	656 18 0	Norwich*	619 0 0

OUTLON.—For the enlargement of the Outlon Council School buildings near Lowestoft, for the East Suffolk County Education Committee. Mr. F. W. Richards, architect, 14, Stanley-street, Lowestoft:—

Mobbs Bros., 57, Maldstone-road, Lowestoft* £2,000

PORTHCAWL.—For main sewer (368 lineal yds.) at Newton, for the Urban District Council. Mr. R. W. Jones, Surveyor:—

Rees Jones, jun.	£182 0 0	Barnes, Chaplin, & Co.	£189 7 6
Hitt & Sons	168 9 7	W. Jenkins, & Co.	186 10 0
R. W. Hunter	158 9 6	Bridgend*	186 10 0

REDRUTH.—For additions and improvements to the Druid's Hall, for the Public Health Co., Ltd. Mr. H. W. Collins, architect, Clinton-road, Redruth:—

Hodge & Ople	£1,500
A. Carkeek, Redruth*	1,580

REIGATE.—For the erection of a residence, Black-horse-lane, Reigate, for Mr. J. Henderson. Mr. C. E. Salmon, architect, Bell-street, Reigate:—

W. Bagaley & Son	£6,400 0 0	J. King & Son	£6,080 0 0
R. Killick	6,515 13 6	W. Wickman*	5,595 0 0

SANDERSTAD (Surrey).—For the erection of a detached house in Beechwood-road, Sanderstead, for Mr. and Mrs. G. L. Pepler. Messrs. Pepler & Allen, 3, George-street, Croydon, architects:—

W. Potter	£1,005	Worsfold & Sons*	£978
Grace & Marsh	987		

SPRINGFIELD.—Two shops, Springfield, Essex. Mr. R. Mawhood, architect, Chelmsford:—

F. Cracknell	£800	W. Sarums	£760
W. Fincham	785	Baker & Sons	735
J. Gowers	785	E. Weight, Spring-Beckett Bros.	735

STODY.—For partial restoration, Stody Church, Norfolk. Mr. H. J. Green, architect and Diocesan Surveyor, 31, Castle-meadow, Norwich:—

Chistob & R. Chapman	£1,626 1 2		
Grimson	£2,793 9 7	R. W. Riches	1,590 0 0

SWANLEY JUNCTION.—For an addition to the Kent Jam Company's (Ltd.) factory at Swanley Junction, Kent. Quantities by the architect, Mr. W. S. Skinner, Bristol:—

H. L. Holloway	£3,282	J. Lonsdale, Swan-ley & Co.	£2,748
W. Johnson & Co.	£2,095	Kent*	£2,748
W. F. Blay	2,846		

WESTON SUBURGE.—For water supply works, for Peabody Rural District Council:—

W. H. Reading, Wolverhampton .. £143 15 8

W. H. Lascelles & Co.

121, BUNHILL ROW, LONDON, E.C.

Telephone No. 1365 London Wall.

HIGH-CLASS JOINERY, LASCELLES' CONCRETE.

Architects' Designs are carried out with the greatest care.

CONSERVATORIES, GREENHOUSES, WOODEN BUILDINGS,

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THE BUILDER, MAY 27, 1905



NY PHOTO J. PRAGUE A.C. L. 4 & 5 EAST HARDING STREET FETTER LANE E.C.

DESIGN FOR RE-BUILDING KING'S COLLEGE HOSPITAL. MESSRS W. A. PITE & R. J. BALFOUR, ARCHITECTS.
VIEW OF ADMINISTRATION BLOCK.

GENERAL BLOCK PLAN

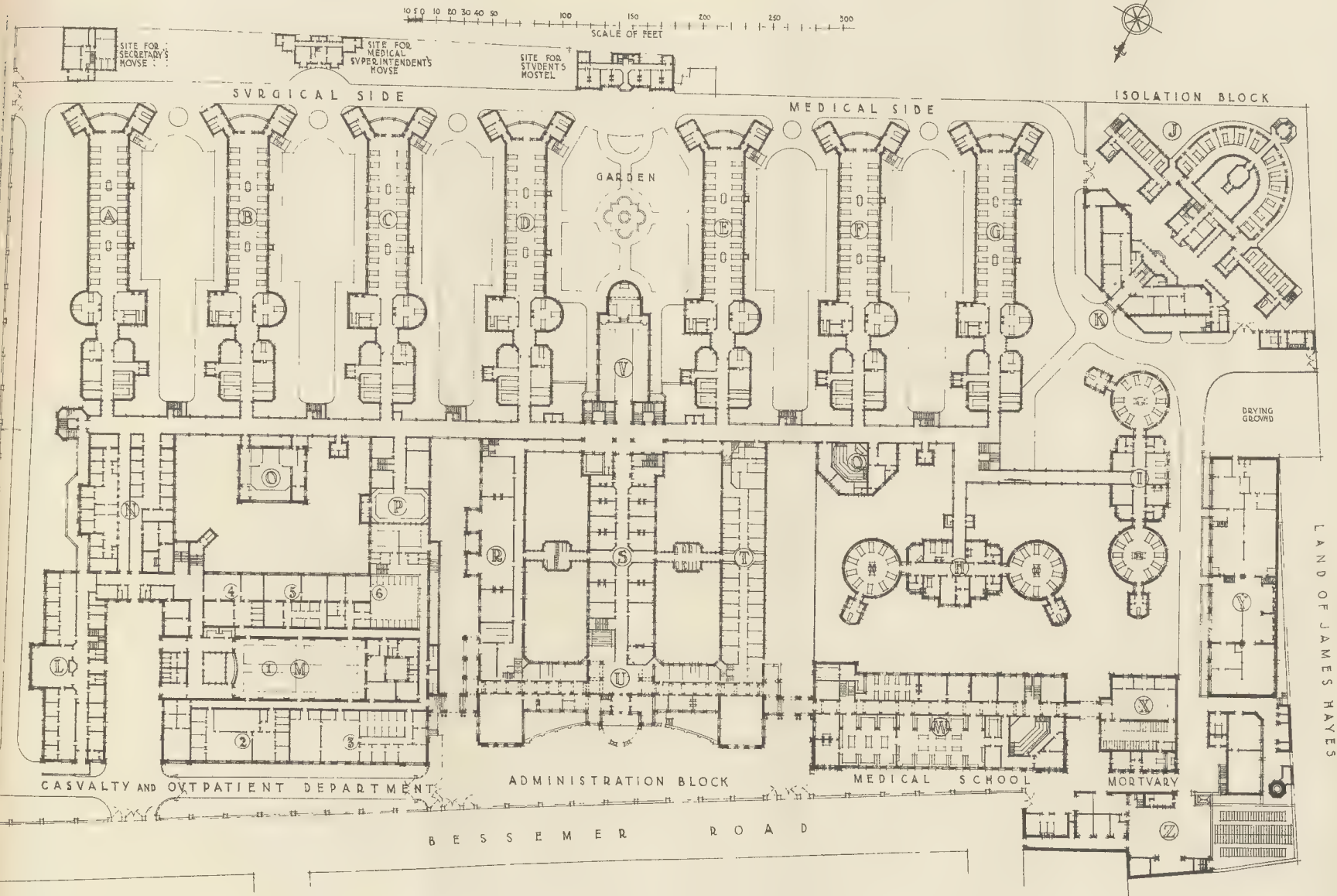
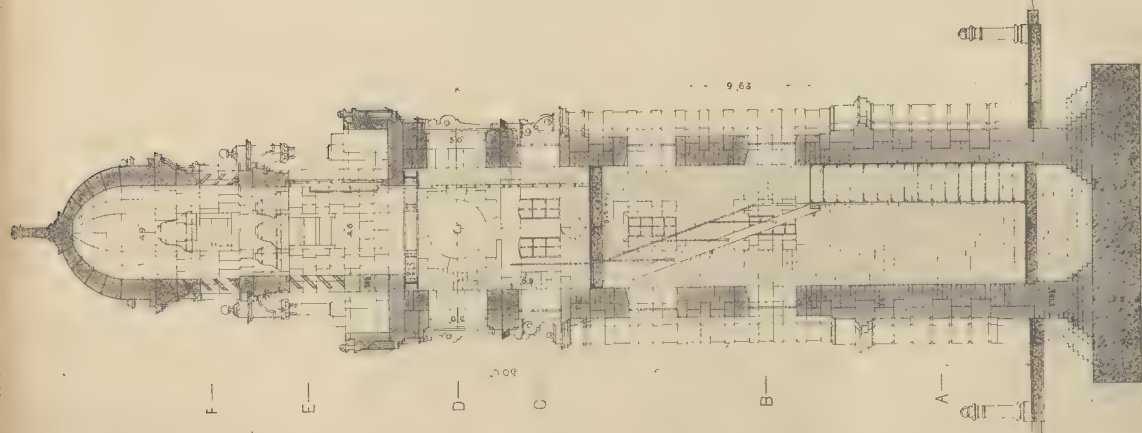


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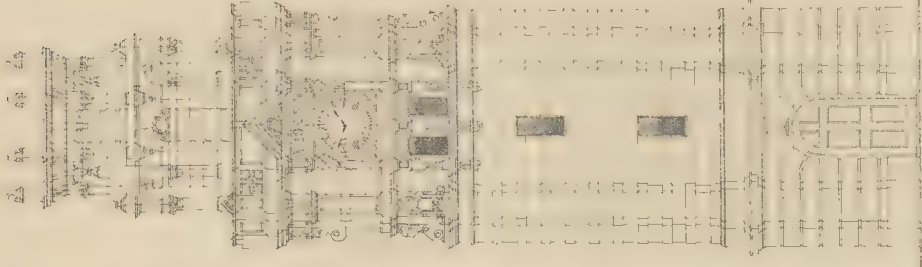
NEW PUBLIC OFFICES, SEACOMBE, CHESHIRE.—MESSRS. BRIGGS & WOLSTENHOLME AND A. THORNELY, ARCHITECTS.



SECTION

Notes for Specification

- 1 Concrete Portland Cement Concrete for foundation, composed of 1 part Portland cement to 5 parts clean Thames ballast
- 2 Portland Cement Concrete Floor 6" thick is Gravel floor and Clock Chamber covered with Asphalt paving 1" thick.
- 3 Brickwork. Brickwork to be built in good hard sand, brick in other approved bricks and cement mortar, composed of 1 part Portland cement to 4 parts clean washed sand. Brickwork to be finished with four feet inside.
- 4 Stone. The stone to be Portland Stone known as Whitehall.
- 5 Limes. Limes to be Gravel floor and played down to Ballroom for access to roof to be in length 10m 5' 10m, being to 1' 4" over and out with one course.
- 6 Limes. Oak Limes 5' 10m and 1' 10" Oak frame in Ballroom.
- 7 Windows. The windows will be set in cast iron frames with glass panes glass.



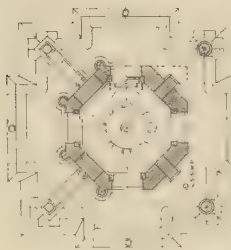
ELEVATION

- 8 Stone. West Iron Disposition for access to Clock Chamber and Ballroom. The deep ladder to Clock Chamber to be 5' 0" wide and can be used in the 15' 1" strong and 1' 1" deep concrete base connected to strong with small angle iron brackets riveted on the strong supported one 15' 1" new limes one end built into the brickwork.
- 9 Ladder for access to Ballroom above Clock Chamber to be 4' wide with 2' 1" strong and 1' 1" deep concrete to strong. The ladder to have 2' 1" wide iron strong on the floor one end built into strong and other end built into brickwork.
- 10 Limes. The ladders to have cast iron handrails brackets and hand or given round all complete.
- 11 Brickwork. The water from Ballroom will be taken down by means of Pipe 3" diam water pipe in angle off knee to gully in Basement floor.
- 12 Balling. The Balling will be paved with Asphalt paving 15' thick on a 6" bed of Portland Cement Concrete and finished with a 3' 6" Granite road.
- 13 Limes. The damp standards and standard posts will be of the standard manufacture and of stone pattern.
- 14 Clear Dial. The diameter of the Dial is 3' 6" reckoning 1' 6" for each 10 ft of height.
- 15 Cost. The approximate estimated cost of the proposed Clock Tower (exclusive of the Clock) will be £ 1097 18 6



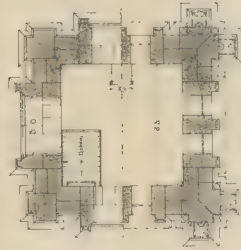
PLAN OF DOME
LOOKING DOWN.

HALF PLAN AT F.



HALF PLAN AT E.
BELFRY

HALF PLAN AT D.



HALF PLAN AT C.
CLOCK CHAMBER

HALF PLAN AT B.



HALF PLAN AT A.



The Builder.

VOL. LXXXVIII.—No. 3252.

JUNE 3, 1905.

ILLUSTRATIONS.

Wall-papers.....	Designed by Mr. Walter Crane, Mr. W. J. Neatby, and Mr. J. W. Turner.
The Hall, Hengrave, Suffolk.....	Messrs. J. L. Davenport & J. W. Tepper, A.R.I.B.A., Architects.
New Building for the London Salvage Corps.....	Mr. Paul Waterhouse, F.R.I.B.A., Architect.
Sketches.....	By Mr. W. Eaton, A.R.I.B.A.

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Competition Designs for King's College Hospital.



THE six designs submitted in the limited competition for the new buildings of King's College Hospital at Denmark-hill have been on view

for a week in the Carpenters' Hall, London Wall. One of the first thoughts which struck us on entering the room in which the drawings were hung was the economy of labour which had been effected by limiting the competition. While it is true that a few architects may gain by the system of open competition, there can be no doubt that the profession as a whole is the loser. Instances could be given of competitions in which the unsuccessful competitors must have spent in hard cash more than the successful competitors would receive in premiums and commission, and this fact is one which architects ought not to overlook; though in the case of buildings of the first architectural importance open competition is often desirable. In the competition under review, the scale of 1/16 in. to an inch was specified for the general drawings, and a still smaller scale for the block plan, so that the competitors' labour was rendered as light as possible. A perspective was, however, required; although it is questionable whether, in a competition for a building of this kind, such a drawing is of the slightest use.

The designs of the six competitors were described by letters, and were hung in the following order, Y, X, B, Z, T, and A. Whether this was intended to give the order of merit or not we cannot say, but it will be convenient to adopt this order in considering the designs. The accepted design, Y, is by Messrs. W. A. Pite and R. S. Balfour, although Mr. Pite's name only was attached to the drawings; the names of the authors of the other designs were not stated, nor were the reports exhibited. As we have not been able to obtain a copy of the conditions of the competition, we do not know whether all the architects have complied with the instructions.

The site is a fairly regular oblong, bounded on the north-east (which is one of the shorter sides) by Denmark-hill, on the north-west (one of the longer sides) by Bessemer-road, and on the south-east and south-west by properties belonging to a railway company and to private individuals. The four angles of the site point approximately to the four points of the compass. Denmark-hill has a considerable fall from the east angle of the site to its junction with Bessemer-road at the north angle, while the latter road is approximately level. All the competitors have placed some of the ward pavilions nearly parallel to Denmark-hill and with their free ends towards the south-east boundary, in order to obtain a large proportion of sunshine in the balconies; but in the successful design this idea has been carried out more fully than in some of the others. A more conspicuous difference is in the position

allotted to the principal entrance, some competitors favouring the more important thoroughfare, Denmark-hill, while others, including Messrs. Pite and Balfour, have preferred Bessemer-road, and on the whole the latter position appears to be the better.

At the first view Messrs. Pite and Balfour's design is not easily grasped, as they have shown the plans of the various blocks of building on a number of small strainers with little or no relation to each other, the only key to the complete scheme being the block plan. All the other competitors have used large strainers, and have shown the various buildings and connecting corridors in their proper positions on the plans of the various floors. The block plan of the selected design, however, is a very useful and interesting drawing, and when this is studied the scheme becomes clear and intelligible. The plan is really a reproduction to a smaller scale of one of the floor plans of the complete group of buildings, and shows the walls, windows, doors, stairs, and some other details. Each block, or, in the case of large blocks, each distinct part, is marked with a red letter in a circle, the letters running through the alphabet from A to Z. On the margin of the plan a printed slip is pasted, which gives succinctly the accommodation provided on each floor of each block or portion of a block distinguished by a reference letter. By the help of this drawing the whole scheme can be understood in all its most important features without much difficulty.

The authors have placed the principal

entrance and administration block in the middle of the Bessemer-road front. The administration block is compactly planned with a front portion nearly parallel to the road, and three portions at right angles to this and extending back to the main ward corridor, which is continued along the back of the block and produced at the ends to afford access to other buildings. Perhaps the shape of the administration block will be more clearly understood if we describe it as consisting of three parallel buildings at right angles to the road, the front ends being connected by another range of building, and the rear ends by the ward corridor. Two oblong courtyards of considerable size are enclosed, and each of these is again divided on some of the floors by a cross corridor and sanitary tower. To the left of the administration block we have the outpatients' and casualty departments, the latter having one side fronting Denmark-hill. The medical school is to the right of the administration block, and beyond this are the mortuary and the laundry, the latter being placed along part of the south-west boundary. Space for a future chapel is provided in a central position immediately behind the administration block, and separated from it by the main ward corridor. To the left of the chapel (that is to say, towards Denmark-hill) this corridor affords access to the dispensary (behind part of the outpatients' department), operating theatres, and casualty department, all of which are on the side towards Bessemer-road; on the rear side of this left-hand portion of the corridor, four "surgical" ward pavilions are shown, one being for a future extension of the hospital. To the right of the chapel there are three "medical" ward pavilions (one for future extension) in the rear of the corridor, and the clinical theatre and a ward block with two circular wards in front of it. A similar block with two circular wards is shown for future extension at the extreme end of the corridor. It will be seen that all the seven principal pavilions, which by the way are three stories high, are in the rear of the corridor, and have their free ends to the south-east; the remaining wards are circular. The isolation block is in the south angle of the site, at the furthest point from the two roads. It is curiously planned; twelve single-bed wards are arranged on each floor in the form of a horseshoe, with a corridor around the inner side, the ends of the horseshoe being connected by a another corridor, which is produced to give access to other wards for convalescent patients. A separate administration block with nurses' home is provided close to the isolation block. An alternative plan of one floor of the isolation wards is given, the main block being rectangular, with a central corridor and wards on each side. A little more space in this corner of the site would have been useful. There is also some crowding of the buildings around the outpatients' department, but, as a large portion of this department is of one story only, the defect is more apparent than real. The positions allotted to the two houses for the medical superintendent and secretary and to the hostel for students are not very satisfactory; the buildings

are shown to abut on the south-east boundary, and if, as we presume, there is no right of light on this side, the principal windows must face north-west, and will be unpleasantly near the patients in the sun-balconies of the ward pavilions.

The details of the ward pavilions have been carefully considered; the sanitary towers are placed diagonally at the free ends, the outer corners being rounded to give more light and air to the balconies. Externally the design is simple but not commonplace, and there can be no doubt that, as regards the important question of cost, the design will compare very favourably with most of the others submitted in the competition.

The author of the design marked X has adopted an arrangement which has many points in common with the accepted design. The administration block is in the middle of the Bessemer-road front, the outpatients' department being to the left towards Denmark-hill; the main ward corridor extends behind the administration blocks, and is produced at the ends in a direction approximately parallel to Bessemer-road; the principal ward pavilions are in the rear of the corridor with their free ends towards the south-east; the laundry extends along part of the south-west side, and the isolation block is in the south angle. The principal points of difference are in the location of the medical school, which is placed at the Denmark-hill end of the main ward corridor and has an entrance from that street, and in the provision of six pavilions (instead of seven) in the rear of the corridor, and of three in front of it, two of the latter being circular. The houses for the secretary and medical superintendent are certainly shown in a more suitable position than in the accepted design, sites being reserved for them to the right and left of the administration block, but a little nearer Bessemer-road; the aspect and situation are, therefore, all that can be desired. The laundry is also grouped with the other buildings in a way to facilitate the working of this department of the hospital. Externally the design is simple and effective, and is shown by an admirable pen-and-ink drawing. The question of cost has evidently been carefully considered, and the design as a whole is an extremely able piece of work.

The author of design B appears to have had too little time to do justice to his own ability. His drawings are uncoloured, and therefore do not show to the same advantage as the other designs, and alterations have been made by means of patches and otherwise which detract still more from their appearance. The administration block occupies nearly the whole of the Denmark-hill front, space being reserved for adding the medical superintendent's house to the left-hand end, and the secretary's house to the right-hand end. This block is planned in a very straggling manner, and is the weakest part of the design. The wards are much more satisfactory. From the central entrance a corridor leads through the administration block and is continued as a ward corridor along the longitudinal axis of the site to the laundry on the south-west side. On the south-east side of the corridor there are six large ward pavilions, and on the north-west side four small pavilions, one of the former

and two of the latter being for future extensions. The medical school is inconveniently placed in the west angle of the site, and the isolation block is between this and some of the other buildings. The outpatients' department is near the middle of the Bessemer-road front, and the casualty department between it and the resident medical officers' wing of the administration block; this part of the plan is very crowded.

Design Z is shown in a series of excellent drawings, and displays considerable originality. The administration block is placed almost exactly in the centre of the site, and is approached from Bessemer-road by a double drive leading to the ground-floor level, with a central drive between leading down to the level of the basement floor. The outpatients' department is in a detached building to the left of the drives, and the medical school to the right. The three buildings form, therefore, nearly the whole of the three sides of an oblong courtyard, in which the drives are placed, and the architectural effect would be decidedly good. The main corridor runs through the administration block parallel to Bessemer-road, the secretary's offices and medical officers' quarters being in front of the corridor and the nurses' quarters behind. The corridor is produced at the ends to give access to the wards, etc.; the left-hand portion (towards Denmark-hill) has three ward pavilions in the rear and two in front, and the right-hand portion has four in the rear and two in front; one of the front pavilions on each side of the centre has circular ward. This part of the plan is well conceived, but is almost entirely detached from the front range of buildings adjoining Bessemer-road.

We have said that in this range of buildings the outpatients' department is immediately to the left of the central drives or courtyard, and the medical school to the right; beyond the latter there are the laundry and (near the south-west boundary) the isolation block, this part of the plan being somewhat crowded. Space for the hostel and chapel is provided between the outpatients' department and Denmark-hill, and for the medical superintendent's house at the upper or south-east end of the Denmark-hill front; the secretary's house is behind the superintendent's house, as we look from Denmark-hill, and is only about 24 ft. from two of the sanitary towers of the ward pavilions.

Two perspectives are submitted, one showing the buildings forming the central courtyard, and the other giving a general view set up from a high horizontal plane, the lofty administration block rising above the surrounding buildings and dominating the whole. The design would, we think, prove more costly in execution than any of those previously described, and the building would not be as convenient.

Another design with the principal entrance in Denmark-hill is that marked T. The administration block is at the back, the nurses' home to the left, and the outpatients' department to the right, being brought forward nearly to the street line, so that the three buildings form the greater part of three sides of a courtyard. The outpatients' department

an exit to Bessemer-road, and round this on the same front is the primary department, with three stories of the above it. On the ground floor there is a corridor behind the administration block and parallel to Denmark-hill, which returned ends communicating with the nurses' home and outpatients' department on front. Behind the transverse corridor two corridors parallel to each other are taken off at right angles and lead towards the south-west boundary. The more southerly and longer of these corridors has six ward pavilions on the one end, and the more northerly and shorter corridor has three on the right and one ward pavilion at the rear end. The space is between the two corridors near the administration block, and the isolation block is in the south angle of the site. The laundry and other buildings are near the west angle, and space for the hostel of two houses is provided in the middle of the Bessemer-road front. The twin corridor arrangement crowds the site, and brings the free end of the large ward pavilions very near the south-east boundary—within 13 ft. indeed at one point. The external treatment is not very satisfactory, and the perspective shows only a glimpse of the Denmark-hill front. The author of design A has placed the principal entrance-gates near the middle of the Bessemer-road front, and has not thoroughly mastered the difficulties of planning the various buildings on the site. For example, there are on the upper ground floor (in addition to the isolation block) six ward pavilions, and all the six over rooms used for the staff, etc., on the lower ground floor. This is not a good arrangement. The external treatment is much better, and is shown by a well-planned wash-drawing; but the cupolas and dome, although effective, are an unnecessary expense in a building of this class. The best design has, in our opinion, been selected, but the design marked X is a good second.

NOTES.

In a letter in the *Times* two or three days ago Mr. Reginald Blomfield raised a much-needed cry of alarm in regard to the degree of interference with St. Mark's and its mosaics which seems to be contemplated under the name of repair. That St. Mark's is in a state of considerable danger we have long felt convinced, and the collapse of the building or of any large portion of it would be an infinitely greater loss to the world than that of the Campanile. Every necessary and possible step should be taken, by ties and other structural supports, to bring it into a safe condition, and this work seems likely to be carefully done under the direction of Signor Manfredi. But then it is asserted that the distortion of the vaults, in some places, can only be remedied by re-laying; that means the taking out of all the mosaics, which of course we can be assured will be replaced just as they were; but we know too well what the loss of such assurances. Tesserae are not like large stones which can be numbered and rebuilt in position;

and then one asks, too, if the vaults are now "distorted" and are to be rebuilt without distortion, how are the ancient mosaics to be refitted to the newly-built surface? When once the removal of the mosaics is begun, there is an end of St. Mark's—the St. Mark's that is the treasure of the world. Worse than this, it is proposed to take up the floor and relay it level. This is wanton destruction. The floor being out of level does not affect the stability of the structure; it is a sign and an effect, no doubt, of the unsatisfactory nature of the ground, but it does no harm in itself to the structure, and to take it up and relay it, besides the danger of damage, would go far to destroy all the ancient associations of the building. It is to be feared that, unless strong protest is made, we shall have St. Mark's practically destroyed by modern Italian architects under pretence of preserving it.

Winchester Cathedral.

When a building has been in existence for many centuries it is by no means uncommon to find that one or more of the walls have gradually deviated to a greater or less degree from the perpendicular, and such deviation taken by itself does not necessarily imply that the structure is in a dangerous condition. But the development of cracks in the masonry is always a matter demanding immediate and serious attention, because it may point to recent deterioration of the foundations or change in the bearing power of the strata below. During the last few weeks the widening of a large crack on the southern side of the east end of Winchester Cathedral has been the subject of inquiry by the authorities, and we are glad to find that Mr. Jackson, the diocesan architect, is already in consultation with the cathedral architects, for the purpose of discovering the cause of, and of devising some suitable remedy for, the weakness of which the fissure constitutes the outward evidence. Until completion of the borings now in progress it will be difficult to form any reliable opinion on the subject. Built upon what was formerly a swamp near the river Itchen, the foundations of the cathedral were strengthened by piles in accordance with early practice, and as it is not likely that these piles have become seriously decayed, we are inclined to the belief that the present subsidence may not be altogether unconnected with a lowering of the water-level in the subsoil. At the depth of 16 ft. from the surface is a bed of gravel underlying the loamy soil on which the foundations are laid, and until the thickness and character of this have been determined by boring operations, the architects will be unable to decide whether it is sufficiently satisfactory for the support of underpinning works, or whether the new foundations will have to be taken down to some lower stratum to insure the complete safety of the super-structure.

Inland Waterways.

We quite agree with the principle that rules established for the orderly conduct of business should not be lightly broken through. Still, we cannot help regretting that the Standing Orders Committee of the House of Commons could not see

their way clear to make an exception so as to permit the second reading of the Canals Bill, the object of which was to establish a public trust with powers to acquire, develop, extend, and administer the canals and navigable waterways of the United Kingdom for the benefit of the nation. One reason which influenced the Committee was the fact that the Bill embodied proposals having the effect of bringing it within the category of private legislation. This point, however, is purely technical, for no proposal of greater national importance has been made within recent years, with the exception perhaps of the various more or less happy schemes of War Office reform and national defence. The powerful railway influence was, of course, exerted against the Bill, which, in common with all who desire the prosperity of the country, we hope will have a successful issue when it is again submitted to Parliament.

The Panama Canal.

An entirely new plan for the Panama Canal has been published in pamphlet form by Mr. Lindon W. Bates, an engineer who has had an extensive experience of canal and other engineering works in Europe and the United States. The author of this scheme believes that the details of the projects already published are not such "as to secure to the American people the best, safest, and most enduring canal," and that he would be "faithless to his citizenship did he not state so." Although the route followed is not materially different from that proposed by the Canal Commission, the scheme is of novel character, and depends largely upon the practicability of constructing barrages resembling those at Assiout and elsewhere in Egypt. Without entering into a long discussion of the several plans now open for consideration, it would be impossible to give an intelligible idea of the new scheme. Its probable feasibility is to some extent confirmed by the announcement that the advisory engineering board of the Commission have already taken the plan into consideration, and interest is lent to this development by the fact that one of the leading spirits on the board is Mr. W. B. Parsons, who has associations with Mr. Bates. If the Isthmian Canal could be constructed, as the author hopes, at a cost of some 17 millions less than the amount previously allotted, the ultimate commercial success of the enterprise should be fairly assured.

Workmen's Compensation.

SINCE our article of last week, one more case on Workmen's Compensation calls for short notice. In *Buckingham v. Mayor, etc.*, of Fulham, the question of What is a warehouse? again came before the Court of Appeal. The respondents have a large yard, two acres in extent. There are railway arches in the yard, and in some of these cement was stored, and the yard was generally described by the County Court judge as a "dumping ground" for waste material. Incidentally the respondents sold wood, which had been used as wood-paving. The Court held that the County Court judge had rightly decided that this was not a warehouse. The main importance of the decision lies in the remarks contained in

the judgment of Lord Justice Cozens-Hardy, that the word "warehouse" involves the idea of a place where goods are stored for sale or for some commercial purpose, and that even then every space need not be a warehouse—for instance, an open space—and he instanced the unreported case of *Middleton v. Wade & Son*. The fact that some incidental product might be sold did not necessarily render the building a warehouse.

It is curious that the question of what does or does not constitute a yearly tenancy is after all these years still capable of being brought before the courts. Yet this point came up for decision in the case of *Lewis v. Baker* (May 24), and the judge, in giving his judgment, said the point was not free from doubt. The premises were let from May 13, 1901, at a yearly rent payable each quarter "until such tenancy shall be determined as hereinafter mentioned," and then the agreement provided that either party might terminate the tenancy by three calendar months' notice in writing. The landlord gave three months' notice to determine the tenancy from August 13, 1903, but this was held to be a bad notice, since it was a yearly tenancy, and the notice must expire with the year of tenancy. Now in these cases the court has to ascertain what was the real intention of the parties, but in such agreements a certain meaning has been attached by cases decided over a long period of years to particular expressions. In this case all the other terms of the agreement pointed to a yearly tenancy, as, for instance, quarterly payments of rent, the liability to repair, to pay taxes, and the right given to eject the tenant, and the clause as to three months' notice merely engrafted the one special provision that such tenancy might be terminated by three months' notice in place of six months, the time usual in yearly tenancies in the absence of express agreement. The lesson to be learned from the case is simply this, that landlords and tenants and their legal advisers are too fond of general forms carelessly adapted to the particular case, and that much litigation would be avoided did they take the trouble to express their intentions before entering into agreements and not afterwards.

THE paper on "Wireless Telegraphy Measurements," by Messrs. Duddell and Taylor, which was discussed at the Institution of Electrical Engineers last week, marks a real advance in our knowledge of the laws which govern the transmission of "wireless" signals. On the initiative of Mr. Gavey, of the Post-Office, elaborate experiments were carried out first at Bushey Park and afterwards in the Irish Channel. By means of a novel form of galvanometer, devised by Mr. Duddell, accurate quantitative measurements could be made of the currents in the "antennæ," or long vertical aerial wires at both the transmitting and receiving stations. The results of the experiments verify laws which were enunciated by Marconi some years ago. Except when the stations are very close together, it is found that the intensity of

the signals varies inversely as the distance between them. This law was verified up to a distance of fifty miles. The steamer *Monarch*, of the Postal Telegraph Department, had a vertical wire suspended from a mast, and signals were sent continuously from the steamer to a station at Howth during the voyage from Howth to Holyhead and back. The results prove beyond the possibility of doubt that the law of the inverse distance is true. This result is of the greatest importance. Hitherto electricians have been doubtful as to the nature of these wireless signals. Some have held that they are Hertzian waves and others that they are the ordinary electromagnetic waves which arise every time a current is started in a wire. It seems to us that the experiments described in this paper prove that the waves actually instrumental in working the "coherer" belong to the latter class. Captain Jackson, of H.M.S. *Vernon*, in an interesting speech, stated that the results of the authors were in exact accordance with the results they had obtained in the Navy. The difficulties in the way of "tuning" had been almost entirely overcome, so that on board the *Vernon* in Portsmouth Harbour they could receive signals by means of an aerial wire down one mast from Marconi's station at Poldhu, Cornwall, and send signals by means of an aerial wire from another mast at the same time, without the slightest interference effects. The authors express their surprise that improving the connexion with earth of the aerial wire had little effect on its working. It seems to us, however, that this is obvious from theoretical considerations, and, as a matter of fact, in the system devised by Sir Oliver Lodge the wire netting which forms the base of the aerial wire is insulated.

AMONGST the effects of the Elizabethan Stage Society, which will shortly be dispersed by sale at auction, is comprised a carefully-executed model of the Old Fortune Playhouse, with its furniture and working equipment. The theatre, named from its sign, a figure of "Fortune," was first built for Philip Henslowe and Edward Alleyn by Peter Street, carpenter, whose contract, dated January 8, 1600, is printed in Boswell's edition of Malone's Shakespeare. That house, square on plan, and constructed mostly of timber, on the east side of Golden, or Golden, lane, was consumed by fire in the night of December 9, 1621. Its successor, circular on plan, and similar to those in Bankside, was sacked by a party of soldiers in 1649, and twelve years afterwards the ground was offered for building purposes—Playhouse-yard, or passage, leading into Whitecross-street marked the site. The theatre was happily named, for it yielded good profit to Alleyn, contributing largely to the means whereby he founded his College of God's Gift at Dulwich. The playhouse represented in the model should not be confused with the "Nursery" for actors cited by Pepys and other writers after the Restoration, which was established in or about 1667 in Golden-lane, and of which there are XVIIIth-XIXth century views entitled, though it seems erroneously, "The Fortune Theatre in Golden-lane."

At the Modern Gallery (Bond-street) Mr. Tom Simpson's water-colour sketches, nearly 100 in number, of the Cinque Ports and their neighbourhood, though slight in execution, deserve high praise for their artistic character and an effective way in which they convey an impression of this curious and picturesque district with its flat marshy land, tidal rivers, old buildings, and old shipping. Those who have not visited Rye and Winchelsea, Hythe and Sandwich, will certainly be tempted to do so by these picturesque illustrations of their architecture and landscape.

At the Dutch Gallery in Grafton-street there is a collection of water-colour sketches by Mr. A. S. Forrest illustrating scenery and personages in Jamaica and elsewhere in the West Indies, which, as rapid and cleverly-executed impressions taken on the spot, are of considerable interest. A good deal of local character and manner is suggested in the sketches of "A Bungalow on the Hills, Jamaica"; "An Evening Party on a Balcony, St. Thomas"; "A Coloured lady on a Race-course, Jamaica," etc. Many other scenes and characters of West Indian life are brought before us in the collection.

At Messrs. Dickinson's Gallery in Bond-street there is a collection of water-colours by Mr. Hamilton Auld, under the title "Sketches in many lands." These, as the work we suppose of an amateur, are of great merit, which we are more ready to recognise as they deal largely with architectural subjects—old castles, churches, etc., all very well-treated.

THIS "spasmodic" publication, which was referred to in one or two speeches reported in our last issue, appears to be the production of some light-hearted members who think that the Architectural Association is becoming too solemn an institution, and wants a little enlivening criticism. Institutions, like individuals, have a tendency to become more solemn as they get older, and it may be true that the spirit of camaraderie in which the Association was first founded has been a little forgotten. The title of the publication is not quite a happy one; it has tempted the promoters to disfigure the cover with a purple blot which troubles our sense of decorative fitness; and moreover Horace, the originator of the expression as to the "purple patch," is instanced only to condemn it as an artistic blunder; as would be proved if the whole passage were quoted, and if the detached sentence which forms the motto of the publication:—

*Incepta gravibus plerumque et magno preces
Purpureus, late qui splendet, unus et alter
Adsumit pannus, cum lucus et ara cruenti,
Et proferantur aquæ per amonem ambrosia sacro,
Aut flammæ Rhenum, aut arcus;*
Sed nunc non erat hic locus.

In free translation (you cannot translate literally Horace's ellipticisms):—It is not here that we have started (a poem) in grave matter, and with great professions, to go on with descriptions of the grove and altar of Diana, the winding of a brook through the pleasant fields, or the river Rhine, or

rainbow, etc., is like putting a purple patch here and there (on a garment); "it had no doubt, but entirely out of place." It is worth while to recall the meaning of the passage, sometimes overlooked. However, a little fun is never out of place, or it were an unwholesome world. Among the contents of the present "spasm" the description of the water of "Mr. Pushman" has a more serious intent than appears on the surface; we wish we could think there was less basis for it in fact than we fear is. If the authors of the "Patch" all run spikes into the humbugs of the architectural profession, they will have a more entire sympathy.

NOTES ON ROYAL ACADEMY PICTURES.

LOOKING for further pictures which have sufficient individuality to merit notice, we find in Gallery I. Mr. Tuke's "The Three Comrades" (29), one of his favourite bathing scenes, in which two youths and a dog are the subjects, and we have again the incident which has so well, the nude figure in full sunlight, in this case fortunately not disguised under the name of a Greek god, but presented solely as what it is. This is a work quite in Mr. Tuke's best way. Another picture in the same gallery that is worth attention is Mr. Val Havers's "A Spring Fantasy" (40); "Fantasy" is the word for it; a broadly treated landscape clothed in light and air, in which half-nude figures dance joyously, not without a grace of their own; the whole thing hangs together and is a true "picture," an artistic conception.

In Gallery II. Mr. La Thangue's "A Sussex Island" (72) is a bold and vigorous work in a new well-known style, but he lays on the paint too thick regardless of planes of distance, so that the hedge and trees in the background seem to press close against the woman's head and the foreground of the school which is too intent in painting us that painting is only the translation of nature by pigments; the position is true enough, but we want sometimes more nature than pigment. Mr. Gribble's "The Fight with the Sally Rover" (81) surely it should be "The Rover"—vide "Robinson Crusoe" is a sea scene picture with the craft of a by-gone age, but what is the boat in the foreground pulling away, and with no apparent connection from the scene of action? This incident rather vitiates the reality of the work. Mr. Daniel Smythe's "April Bloom" (133) is a really painted bit of common and sky framing a figure of a French peasant child who looks unhappy, for no obvious reason; but it is a real little picture. Mr. Albert Goodwin's "The Happy Island of Salabat" (126) part of a series of the adventures of Sindbad, we mention because it is his, but we can hardly say one of his successes.

In Gallery III. Mr. Melton Fisher's "Mrs. Macanachi" (151) is a portrait of considerable dignity. Lady Butler's "Rescue of the Wounded: Afghanistan" (152) is spirited enough, but are cavalry horses in the thick of campaign really as shining and well-groomed as these? In "Chelsea Pensioners at Home" (153) Mr. Jacob-Hood has made a good little picture out of the well-known large room at Chelsea Hospital. Mr. Campbell Taylor essays "Daisy and the Red-cross Knight" (157); what a Una! a comely hospital nurse on a balcony. Artists should have a little imagination before they attempt subjects of this kind. In "The Sun-dial" (163) Mr. Monat Loudan has produced rather a fine illustration of the repeated dial motto, "I mark only the busy hours." It is a broadly painted garden scene filled with light and colour, and the pose of the girl leaning against the sun-dial is of grace and the glamour of happiness; the other figures are a little stagey, but this picture with unity of style about it. Mr. C. W. Joy endeavors to illustrate Tennyson's "Dream of Fair Women" (165), with Jephthah's daughter in the midst of her spirited turmoil, and Cleopatra, the queen "throned on a berry rise"; it is well meant, but it is all too hard and realistic, and there is nothing about the scene of the glamour of that wondrous summer-morning wood, so exquisitely described

in the poem. It is the same case as Una and the Knight; poetry reduced to plain prose in painting; it will not do. Mr. Frank Dicksee's "Lady Hillingdon" (168), a seated portrait in bright costume, is good in all but the face, which is decidedly the weakest part of a portrait in which the dress and accessories are admirably painted. Mr. J. J. Shannon's half-length of a girl under the title "Blue-bow" (176) is a work which will be appreciated by painters rather than by the public; it is essentially a study in colour, and a very interesting and effective one; it is only a pity that it conveys so decidedly the impression that the girl's face is not very clean. A couple of war pictures salute us at the end of the room, effectively hung as contrasts; Mr. Wollen's "Scouts" (187), a couple of hussars half screened by tree-trunks, taking note of the enemy descending the hill in the distance—a capital bit of painting of the professional warrior; and Mr. E. Bundy's "The Morning of Sedgemoor" (194), where we see the amateur and rustic soldiers, with scythe-blades lashed to the end of poles, waking in the morning with evidently no cheerful anticipations. The balanced position of these two pictures is effective, and a point in favour of the hanging Committee. The veteran artist Mr. Sant surprises and pleases us by a small painting, "A Music-lesson" (188), a sweet-looking rustic boy taking his flute from his lips to listen to the birds, which is quite modern in style and colour; it is rather rare to find a painter who dates back to a former generation thus assimilating the style of the younger generation and keeping artistic pace as it were, with them. In "The Nightingale's Song" (205) Mr. Macbeth shows a life-size figure of a very beautiful girl—fortunately a variation on his eternal type of rustic beauty—standing at the open casement in her nightdress to hear the nightingale; an appropriate poetical quotation in the catalogue brings the spectator into time for what is really a rather poetical picture. Hung up high is one of Mr. Goetze's popular religious pictures, large and commonplace; this time a picture of the Crucifixion (213). Fancy sending a picture of the Crucifixion to the Academy, as a bid for popular English religious sentiment. There is something almost profane about it. On the same wall is the President's "The Cup of Tantalus" (222), a painting with more charm in it than appears at first sight; the subject is rather meagre, only a Greek girl in diaphanous drapery endeavouring to reach up a cup of water from a small fountain to two others on a little terrace above; there is a great deal of grace in her figure, and the picture is full of little incidents—the flocking of sunlight through the trees, the distant city on a hill, seen across the bay; it will repay looking into, though it is not a work on a level with "Storm Nymphs" and some others of its predecessors.

Gallery IV. is rather the room of what are called subject pictures, like Mr. Walter Langley's "The Woman's Part" (228), a satirical title for a painting of seaside life, where the woman carries the heavy basket of fish and the man smokes his pipe. It might be replied that the man has had the more arduous task of catching the fish; but the point is that this is one of the pictures which are mere studies of character, not in the highest sense works of art. The same might perhaps be said of Mr. Dendy Sadler's "The Dover" (282), but the humor here is of a much higher order, and raises it to the level of art. Mr. Dolman's "Harvest" (236) is another war picture—a picture with a moral, but painted with an intensity and earnestness which place it above the ordinary level of preachment pictures. It is harvest time, for we see the corn stacked in the fields, but here the harvest is that of war—a train of carts filled with wounded brought from some battlefield. We have no liking as a rule for pictures with a moral, in which too often the art is of the poorest and the public are equally contented with it; but this is a powerful one of its kind.

Mr. Cope's portrait of the Emperor of Germany (241) has the merit of being no mere "State Portrait"; it is a powerful work, quite above the usual level of royalty portraits. Mr. Lorimer's "Midsummer Eve: a Reverence to Roses" (242), illustrating some ancient custom that we know not of, falls between two stools; it is neither realistic enough to impress us as fact, nor broadly painted enough to impress us as style; it is a good subject, but the treatment of it falls flat. Mr.

Fulleylove's "The Jasper Column in the Mosque of Omar" is the largest architectural picture we remember to have seen from him, and a very good and carefully painted one. Mr. Allan Davidson's "Lady Godiva" (261) might as well have any other name, but is a very well drawn and refined nude figure. A picture quite out of the commonplace is Mr. Melton Fisher's "The Prelude" (266), practically a portrait though not so described. This is a figure of a lady seated playing a guitar, clad in a light blue dress, and with a most expressive countenance; quite a poetic work in its way. Among pictures to be noted in this room, too, is Mr. Matthew Hale's "The Invaders" (279), a snow scene in a wide valley with rocks at the opposite side red in the setting sun, and in the centre a motley horde of men and horses struggling in a long line through the snow; a kind of idea, apparently, of the invasions of the Goths; it is a suggestive and original work.

In Gallery V. Mr. Charlton supplies another of the war pictures of the year, going back for his subject as far as Balaclava (295); but it is the ordinary conventional battle picture, and does not impress with its reality. Mr. J. J. Shannon has two portraits in this room, one of a child (312) which is remarkable for its quality of colour; that of "Lady Dickson-Poynder and Her Daughter" (298) is also fine in colour, but one wonders why the lady has so tragic an expression. Mr. Wetherbee's "A Pensive Shepherd" (316) is another of his charming idyls in which landscape and figures combine into one pictorial ideal; in this case the picture is remarkable for admirably designed but quite unforced composition, in which the figure is placed exactly right for giving the key to the whole; the landscape would be incomplete without the figure, the figure without the landscape; this is real art. Mrs. Hunter's "Blue Fancies" (335) is of course really a composition of figures and landscape, though of a different type from Mr. Wetherbee's, and here we may notice the difference between perfect and imperfect composition; both landscape and figures are good in Mrs. Hunter's picture, but they do not combine into a whole, they produce the impression of having been considered separately, and the picture has therefore not the satisfying unity that we see in the "Pensive Shepherd," though a painting by so clever a lady cannot be without interest. Mr. Bacon's portrait group of two children (327) is charming in its bright and natural expression; and in the same room we have Mr. Walter West's contribution to the Academy, "The Guardian" (345), an interior in his usual carefully studied style, containing a delightful figure of a carefully dressed old gentleman of the Georgian period, and his ward, a young lady whose dress contributes effectively to an admirable colour scheme, but whose head is a little too large for symmetry. We must not pass over in this room Mr. Reid's "A Little Cornish Fisherman" (303), one of his bright and clear seaside pictures in which also the two children are charming.

In Gallery VI. we have what we regret to find is Mr. Orchardson's sole contribution this year, "An Unfinished Symphony" (369), played in a studio by the artist seated before his easel with a violin; that it is "unfinished" is perhaps due to the intrusion of the child with his toy engine, who supplies the artist's favourite effect of a figure placed alone in the middle of a floor; but though there is a certain interest in the picture, it is not an important work for Mr. Orchardson. Mr. Sargent's very clever picture "A Veil Gone" (376), in other words, "In Full Sail," we confess we cannot make out; is it a woman masquerading in a man's cloak? In any case it is a remarkable work, with the handsome but rather malicious face emerging from above a mass of dark cloak that fills all the rest of the canvas; it is just an artist's inspiration, and the subject really does not matter; it makes its effect and will not be forgotten.

In Gallery VII. Mr. W. H. Bartlett's "Waiting for the Island Boat; Co. Donegal" (414) is an almost perfect picture of its kind, in composition and in the treatment of landscape and figures; though the subject is a simple incident of everyday life, it is treated so as to make an artistic whole, and is one of the best things Mr. Bartlett has ever done. Mr. Dendy Sadler's "A Mother's Meeting" (423) is chiefly remarkable for the satirical humour with which the figure of the clergyman reading loud is treated; the good man might pass exactly for the Rev. Mr. Collins in "Pride and Prejudice." In

"Alone" Mr. Paddy (432) gives another variation on the class of subject he is fond of and by which he made a reputation first; in this case a shipwrecked sailor, the only one who has got alive to land, sits on the bare sun-scorched stony beach in despair: the picture is powerfully painted in every sense. Among other pictures in this room are a sumptuous portrait of a beautiful young lady (460) by Mr. Sargent; "Mixed Company at a Race Meeting" (455), by Miss Lucy Kemp-Welch, an almost pathetic painting of waiting horses of all social grades, tied up in a long row with their heads over a rope; Mr. Arthur Lemon's "In Tuscany" (465), in which the prominent subjects are two large white solemn peaceful oxen; Mr. Logsdail's large view of "Lincoln Cathedral" (473), which as an architectural picture does not satisfy us very much, and does not convey the scale of the three towers; and Mr. Sims's bright little work "The Kite" (466), in which a little boy and his lady guardian again find place. This is a very pretty and interesting type of picture, but we want to know when this painter is going to fulfil the promise given in "Trying Their Wings" some years ago. We are still waiting for it.

Gallery VIII. contains Mr. Frank Bramley's large and important picture "Grasmere Rush-bearing" (492), an illustration of a picturesque local custom. It is more like a Salon picture than an Academy picture, and in fact wants a wider space to see it in. As it hangs here the figures seem rather crowded together and do not detach themselves sufficiently; if one could see it at a greater distance this effect would perhaps disappear. The background, with the church tower standing out against a fine and freely treated sky, is very effective. In France such a picture as this would be bought by the Government for presentation to some local public building; but we fear there is no such chance in this country. M. Jean Casse's spirited head, "Gentilhomme: Louis XIII." (505), should not pass without notice, nor Mr. A. Streeton's interesting fantasy "Allegory from Omar" (514). In Gallery VII. we should have noticed Mr. R. Christie's large decorative picture "Flora's Bower" (458), figures of nymphs enshrined amid a mass of flowers; it would make a very suitable mural decoration.

There are a good many pleasing little pictures in Gallery IX., dedicated to small works; we have only space to mention, among them, the admirable study of the head of a donkey in "A Dry Pump" (583) by Mr. Sydney Hayes, and Mr. Val Havers's "A Day-dream" (614), a picture original both in conception and colour. In Gallery X. Mr. Olivier exhibits a long frieze-like picture of the Resurrection, "Easter Morn:—Matthew xxviii. 9" (709), which would make a fine mural decoration for a church, and was possibly painted with that object; it is not all that the subject demands, but a work with serious intention and carefully carried out. In this room we notice also Mr. Stanhope Forbes's group in the stern of a boat, "Whiffing" (727), one of his pictures of seafaring life which are always capable and interesting. Gallery XI. contains one of the admirable little Still Life studies with which Miss Catherine Wood (now Mrs. Wright) has made a reputation; this one is a brilliant study of "Birdskins from Central America" (772). Mr. G. Henry's "The Chinese Kilim" (787) is really a portrait, and a very effective one, of a girl in green holding a Chinese porcelain monster in her lap, the value of which in the picture is considerable, and it goes admirably with the green dress. Mrs. Stanhope Forbes's "The Wood-cutter's Little Daughter" (794) on her knees in the wood, is interesting both in artistic effect and in feeling. Mr. A. W. Strutt exhibits a clever little satire on the motor car, "They'll Want Us Again" (831: "us" being the horses criticising the breakdown of the motor).

We have purposely been passing by the landscapes, of which the most powerful are the two sea-paintings by Mr. Somerscales, one of which, "The Derelict" (528) we nearly missed through its being hung close to the ceiling. Why the pictures of such a sea-painter as Mr. Somerscales are skied in this way is, we suppose, one of the inner mysteries of the Academy. "The Derelict" is a fine work, but not equal to the other, "Teneriffe" (732), a dark sea with one ship on it, and the Peak rising bright off the horizon line; this also is hung far higher than it ought to have been. Landscape is not the strong point of the exhibition, but there are things to be looked at (besides those mentioned

in our previous article). In Gallery II. there is Mr. North's study of the effect of "Snow in Spring" (127), Sir E. Waterlow's "Moonrise on the Ouse" (105), and Mr. Campbell Taylor's "The Canal—Sunset After Rain" (120), a very effective little picture of old houses on a canal bank seen under a peculiar light. In Gallery III. Mr. R. W. Allan's harbour scene, "Home and Shelter" (144), with a wild sea beyond, is quite one of his best productions; and this and the next room contain two of Mr. H. W. B. Davis's Scottish landscapes with red-deer as the foreground figures (161 and 283), the quality of which is known to all frequenters of the Academy exhibitions; and it may be observed that Mr. Davis contrives to treat the same general subject of this kind without repeating himself so much as some painters of Highland scenery. Mr. Thaulow's "Night in Flanders" (322) is another house and canal scene, very effective in its way. In the same gallery (V.) is Sir E. Waterlow's large landscape "The Thames from Richmond Hill" (330), an important work to be regarded with respect, but somehow it hardly does justice to this world-renowned view. Mr. Olsson's "Winter Gale, Cornish Coast" (409) is a good sea-painting; and while on the subject we may mention two other small sea-pictures by Mr. Ayerst Ingram, "Dawn after the Storm" (4) and "A Spanking Breeze" (397), both excellent bits of sea-painting. Mr. Hopkins's "Moorland, Dorsetshire" (472) is a landscape not to be passed over; also Mr. J. Wallace's warm-toned scene, "Salmon-fishing on the Tweed" (482), and Mr. Harrison Comp-ton's "Autumn in the North Country" (511), a very carefully painted work in which the glitter of the foreground snow contrasts finely with the deep shadow thrown on the opposite side of the hollow; every detail in this picture has been conscientiously studied. In Gallery X. is Mr. Thorne Waite's "A Country Road" (701), an admirably composed landscape; and in Gallery VIII. one feels an interest in the late Mr. Boughton's "Winter in the Marshes" (546), very slightly painted but giving very truly the character of the scene portrayed.

Most of these that we have mentioned are pictures of real interest for one quality or another; and we should like the detractors of the Royal Academy to say in what other exhibition they could find so many.

THE EXHIBITION OF ITALO-BYZANTINE SACRED ART AT GROTTAFERRATA.

THE Basilian abbey of Grottaferrata, near Frascati, is well known to all visitors to Italy who have given more than a superficial glance to the many objects of beauty and interest which the Alban Hills have to show. The abbey was founded by S. Nilus of Rossano, in Calabria, who fled hither with his monks before an invasion of the Arabs and obtained a donation of the site from Gregory I., Count of Tusculum. His death occurred in 1005, and in celebration of the nine-hundredth anniversary of this event it was decided to hold an exhibition of what has been called Italo-Byzantine sacred art—for the reason that, while some authorities maintain that what is called Byzantine art had its birth at Byzantium, others have more recently sustained that it is in reality a development of Roman art. The truth of this thesis in regard to architecture has been upheld in Sig. Rivoira's *Origini dell' Architettura Lombarda*, vol. I., and it is true in regard to architecture it is true in regard to other branches of art also. But the name adopted by the promoters of the exhibition has the merit of leaving the question *sub judice*.

As was the case with the exhibition of ancient Siamese art, noticed in these columns a year ago (*Builder*, June 11, 1904, p. 628), the *locale* is interesting in itself. The monastery is built upon the ruins of an enormous villa of the period of the late Republic or early Empire, some remains of which may still be seen below the garden, while many subterranean passages belonging to it are in existence, but inaccessible to the casual visitor. To restore them and open them up would be an interesting task, and the results repaying. That the villa is to be identified with the famous Tusculan villa of Cicero is possible, but the evidence is not at present sufficient to fix the site absolutely. Of the abbey of the XIth century not very much remains visible, though to this period

may be ascribed the mosaic over the door leading from the narthex into the church, the sculptures of the door frame, and the wooden door itself, while the mosaic of the triumphal arch, representing the twelve Apostles with the empty throne of the Saviour in the centre, belongs to the XIIIth century, and remains of frescoes similar to those recently discovered in S. Maria Maggiore at Rome. The latter half of the XIIIth century, and the latter half of the XIIIth century, exist at it and in the upper portion of the side walls of the church. To the XIIIth century also is to be attributed the "Cosmatesque" pavement of brick, with small arches supported by columns, the majority of which have been filled up to give greater stability to the tower. The interior of the church was, however, spoiled by a restoration in 1534, the XVIth century having here, as in the churches of Rome, superimposed its degraded barbaric taste upon the remains of earlier art of whatever period. The chapel of S. Nilus in the right aisle contains frescoes with scenes from the life of the saint, which are among the most important works of Domenichino. The roof of the building shows the characteristics of the end of the XVth century, having been fortified with a moat and five large round towers by Giuliano della Rovere, afterwards Pope Julius II. These fortifications are fine examples of the work of the period, and need well deserve restoration. A very fine Renaissance doorway, with the inscription IVL (ianus) CAR (dinalis) OSTIEN (sis) above it, may be noticed on the left of the entrance to the monastery; and the colonnade by which the palace of the abbot is entered is a good specimen of the same period.

It is this portion of the building which serves to contain the present exhibition. The first rooms are upon the upper floor. No. 1 is entirely devoted to reproductions of wall and pavement mosaics from the churches of Rome and of reliefs of the VIIIth and IXth centuries (e.g., of the marble crests of S. Sabina). Room II. contains a few reproductions of mosaics (e.g., specimens from the Cappella Palatina at Palermo) and photographs of those of Ravenna and Venice. There is also a capital chest of carved wood of the Xth or XIth century, with curious symbolic representations of animals from the cathedral at Terracina; and a collection of sacred pictures, mostly Russian, which show the persistence of the traditional style even down to the XVIIIth century. Room III. is devoted to the MSS. The abbey, despite the removal of many of its treasures to the Vatican, still retains many codices of considerable value, and the total number of some of the best of these are exhibited, including several interesting palimpsests, a few volumes written by S. Nilus. There are also three rolls of the text of the Gospels from the cathedral at Grottaferrata, and an illustrative of the text—especially of the overthrow of the Egyptians at the Red Sea, and of the Crucifixion, Resurrection, etc. On these rolls belongs to the XIIIth century.

Room IV. contains the collection of stained glass. The Vatican Museum of Christian Antiquities sends some fine specimens, of the earliest work of Achim (Pamphili) in Upper Egypt, which date from the IVth-VIth centuries A.D. and are remarkable for their preservation. The finest piece is an altar cloth with a large cross in the centre and four smaller ones at the corners in tapestry superimposed upon the cotton fabric. There are also several specimens of the garments of the period. Two fine specimens of the needlework of the XIth and XIIth centuries are in the same room. The omphorion or Greek pallium belonging to the abbey itself, worked in gold and silver, which, in the year 1618, as an inscription on that date records, belonged to the Metropolitan of Patras and exarch of Achaia (how it came to Grottaferrata is not known).

* Fragments of other work of this period to the high altar, also exist.

† The successive stages through which the work is well described by Prof. Tassan Din in his *La Basilica di Santa Maria della Vittoria*, pp. 161-169. A section of his work, *La Basilica di Santa Maria della Vittoria*, which has been for many years the subject of publication in the *Archiv für Kunstgeschichte*, is the *Archiv für Kunstgeschichte*.

‡ The "Exaltet" is the formula for the Eucharist.

§ The whole subject of these textile crafts is dealt with in the *Journal of the Society for the Study of the History of the Christian Art and Archaeology*, vol. I. (Munich, 1904).

the altar front (paliotto) from Castell'... showing in two scenes Our Lord... Host and the Cup to the Apostles. There is also an interesting book cover of the 17th century, which originally belonged to the Imperial library at Constantinople and then Cardinal Bessarione, bearing the double...
... contains more Byzantine pictures... the Vatican and a very fine collection of... The best specimen is a consular... of the 17th century from the Museo... at Bologna, but there is a cast of an even... of the beginning of the century... at the cathedral at Aosta, with the figure... emperor Honorius. There are also casts... in the Museo Civico at Brescia, which... representations of the type of which may be... from sarcophagus... and the... with the sacrifice of Isaac from the Bologna... is also exhibited. A diptych of the 15th... from the Vatican is remarkable among... for the height or the relief in which the... stands. In the corridor leading out of this... are some fine photographs exhibited by the... of Public Instruction, the work of... is also seen to great advantage in the... photographic exhibition promoted by the... Associazione Artistica fra i cultori di Architettura in Roma," now open in the so-called Palazzo della Farnesina in the Corso Vittorio...
The next room (No. VI.) contains the chief... of the exhibition. The most important exhibit is the famous *Codex Purpureus*... Rossmo, in Calabria, the birthplace of... Minus, a MS. of the Gospels of the 10th century, written in silver upon a purple ground, and illustrated with remarkable miniatures. The goldsmiths and silversmiths' work is... remarkable—there is the famous cross of... decorated with coloured enamels, a collection of small reliquaries (encolpi) from the Vatican, a silver dish of the 17th century with two angels, one on each side of the cross, a reliquary from Count Stroganoff's collection, and very fine specimens of Byzantine gold jewelry—earrings, necklaces, and rings—... from the collection of M. Neliouff, who was until recently Russian ambassador in Rome, some fine pendants in metal, and a few splendid caskets decorated with Limoges enamel—... from Monte Cassino (XIIth century) and... from the Vatican (XIIIth century). There are also some good chalices of the 15th century, especially one with the accompanying... which belonged to Cardinal Bessarione, and is now the property of the abbey; some smaller specimens from the Vatican have been... by "restoration" in the baroque style.
The next room (No. VII.) contains specimens... the work of the palaeographical school established by the monks, which produces first-rate reproductions of the older styles, while Rooms VIII. and IX. contain modern imitations of the Byzantine style—church vestments, etc. On the lower floor is the small but interesting museum of the abbey, which is always on view, and contains classical and mediæval architectural fragments, inscriptions, etc. (many of the latter being of considerable interest and importance, belonging as they do to the locality itself). Beyond this are two rooms (Nos. X. and XI.) which contain reproductions of... of Ravenna and Venice—correctly—mosaics, capitals, screens, etc.—all very finely executed.
The exhibition is not a large one, but it is the better for that; the objects have been carefully selected by the abbot, Don Arsenio Pelagiani, and Baron R. Kanzler, who travelled all over Italy for the purpose, and, armed as they were with recommendations from both the Government and the Papal authorities, were generally successful in obtaining the loan of what they desired. Some objects are still on their way, and a catalogue will shortly be ready. The exhibition will remain open at least till the autumn, and possibly even later. It is one of the many small exhibitions which are becoming the fashion to hold in the various parts of Italy. Such an exhibition—of the art of the district of the Abruzzi—was opened in Chieti on the 31st ult., and the initiative is most praiseworthy. The exhibition of Grottaferrata has hardly a local interest, however, but, as is fitting in the only monastery in Italy where the Basilian rite is still observed, tends to illustrate the Byzantine style of art associated especially with the Greek church.

T. A.

THE SURVEYORS' INSTITUTION.

The annual general meeting of the Surveyors' Institution was held on Monday at No. 12, Great George-street, S.W., Mr. H. T. Stewart, President, in the chair.

The Hon. Secretary, Mr. H. P. Currey, read the list of officers for the ensuing year, which showed that Mr. T. C. Bidwell had been elected President and the following gentlemen as Vice-Presidents, i.e., Messrs. J. Langridge, T. T. Wainwright, J. W. Penfold, and H. Martin. Mr. S. H. Cowper Coles, of South Wales, has been elected on the Council.

Annual Report and Balance-Sheet.

The President then read the thirty-seventh annual report and balance-sheet, which showed that the total membership of the Institution is now 3,719, against 3,560 in 1904. The Council record with regret the loss of several valued colleagues during the year, i.e., William Sturge, of Bristol, Mr. Alfred Savill, Mr. Thomas Blashill, and others. The receipts for the year 1904 show an increase proportionate to the growth of membership. The estimated value of the investments remains about the same as in the preceding year. The triennial Special Certificate Examinations in the subjects of Forestry and Sanitary Science were held on June 7, 8, and 9 last. For the Forestry Examination eleven candidates entered, of whom six passed, and eight for the Sanitary Science Examination, of whom two were successful. The first Daniel Watney prize for Forestry, of the value of 10*l.*, was awarded to Henry Pritchard, and the second Daniel Watney prize, of the value of 5*l.* to John Ashton Sawyer. There was a slight falling off in the number who presented themselves for the Preliminary Examination in January, 1905, but a marked increase in the entries for the Professional Examinations in March. The number, 504, of the candidates for the Professional Examinations includes 40 who came up for re-examination in their typical subjects. Of these, 3 Associateship candidates and 1 direct Fellowship candidate were in the "Land Agency" sub-division, 10 Associateship and 5 Fellowship candidates in the "Valuation," and 18 Associateship and 3 Fellowship candidates in the "Building and Quantity Surveyors" sub-division. Of these 40 candidates 36 were successful in completing their examination by passing in their "typical" subjects. Deducting these 40 re-examined candidates from the total, the remainder, 464, represents new candidates, of whom 8 in the "Land Agency," 22 in the "Valuation," and 9 in the "Building and Quantity Surveyors" sub-division failed in their typical subject only, and were referred back to their studies in that subject, for re-examination in some future year. Five candidates presented themselves for examination in Glasgow, of whom four satisfied the examiners, and three candidates came up in Dublin, all of whom passed.

After much consideration, the Council have decided to change the names by which the Professional Examinations have hitherto been known. The Professional Associateship Examination will in future be called the Intermediate Examination, and the Fellowship Examination the Final Examination, thus getting rid of some ambiguity as regards the claims of candidates to immediate admission to the classes of membership which have hitherto been associated with these particular examinations. As regards the Fellowship, it is a misapprehension to suppose that a candidate who has passed what has hitherto been known as the Fellowship Examination is entitled, on reaching the minimum age prescribed by the by-laws, to be transferred to the highest class of membership. It is apparently not clearly understood that the candidate for transfer must fully satisfy the Council that he has had such experience in practical and responsible work as the public are entitled to look for in a person describing himself as a Fellow of the Institution. Subject to the rules, it is open to anyone to enter for the Final Examination at the time most convenient to himself, but before the Council will transfer him to the Fellowship he must satisfy them that he has had five years' experience as a surveyor in circumstances satisfactory to the Council, either:—

- (A) As a principal in an established business as defined by the by-laws;
- (B) As responsible manager of an established business as defined by the by-laws;
- (C) As head of a department in the office of a public body; reporting direct to his Board or Council.

A further addition has been made to the list of prizes—this time in connexion with the Scottish Examinations—for which the Institution are indebted to the extent of 5*l.* per annum to the kindness of Mr. William Fraser and Mr. Thomas Smellie Fraser, of Glasgow. This amount has been supplemented by a grant of an equal sum from Institution funds. This prize was awarded to Charles Boyd Robertson.

The other prizes were won as follows:—The "Institution" prize, value fifteen guineas, for the candidate at the head of the list of successful student candidates in the Associateship Examination, by Alan Roy Petrie in the Valuation sub-division, with 850 marks out of 1,000, who also won the "Penfold Silver Medal," for the highest marks in the two sections (student and non-student) of the Associateship Examination, calculated on the basis of their respective pass marks. The "Special" prize, value ten guineas, for the student candidate next on the list, by Harold Francis Hurcomb, in the Building Sub-division, with 830 marks out of 1,000. The "Penfold Gold Medal" for the highest marks in the Fellowship Examination, by Gustavus Taylor Loban, in the Valuation sub-division, with 852 marks out of 1,000. The "Driver" prize, value 15*l.*, by Percy Boothroyd Dannatt, a "Building" candidate for the Associateship, with 858 marks out of 1,000. The "Beadel" prize for the best work in the subject "Agriculture," by Hugh Spencer Mathews, a student candidate in the Land Agency sub-division, with 80 per cent. of the maximum marks in the subject. The "Crawter" prize for the best work in the subject "Principles and Practice of Valuation," by James Calvert Spensley, a candidate in the Valuation sub-division of the Fellowship Examination, with 90 per cent. of the maximum marks in the subject. The "Galsworthy" prize, awarded to the Fellowship candidate who, having passed the Associateship Examination as a student, has obtained the highest aggregate of marks in his Fellowship and Associateship Examinations combined, was won by Charles Frederick Norman, a candidate in the Valuation sub-division, who passed the Associateship Examination as a student in 1904, and whose total marks in that and the recent Fellowship Examination amounted to 1,563, or 78 per cent. of the possible marks in the two examinations. The "Preliminary" prize, awarded annually to the candidate who passes at the head of the list in the Preliminary Examination, was won by John Henry Clarke, of Bedford.

The Council have been occupied during the year with the consideration of schemes for extending the scope and raising the standard of professional education by bringing the advantages of a University training within the reach of such students as are desirous of acquiring a systematic training in some of the scientific subjects cognate to their profession. The existence of an Agricultural Department at the University of Cambridge seemed to present an opportunity for a step in this direction, and a correspondence with the University authorities led to a conference between some members of the Council and representatives of the University Department of Agriculture, at which the following scheme was agreed upon between the Council and the Senate of the University.

- (A) That the scholarships be called "The Surveyors' Institution Scholarships"; that they be three in number, one to be awarded in each year; that the value of a scholarship be 50*l.* per annum, and that it be tenable for three years, subject to the scholar satisfying the authorities of his college in regard to progress and conduct.
- (B) That the scholarships be open to students of the Surveyors' Institution, provided that, at the time of taking the Scholarship Examination, they have passed, or obtained exemption from, the whole of the previous examination of the University.
- (C) That each scholar, on election, must become a member of a college, and, if a student of the Institution, must sign an agreement with the concurrence of his parents or guardians, to become articulated to a member of the Institution.
- (D) That, subject to the approval of the Council of the Surveyors' Institution in each case, the term of articles and residence in the University may run concurrently for the last year of the holding of the scholarship.
- (E) That a scholar who has obtained an honours degree, in the manner prescribed below, be exempt from all except professional subjects in the intermediate and Final Examinations of the Institution.
- (F) That the prescribed course of study for scholars be as follows:—

Each scholar must pass the first part of the Natural Science Tripos, and obtain the University Diploma in Agriculture before the end of his third year. Scholars must take Chemistry and Botany as two of the subjects in the first part of the Natural Science Tripos, and not less than one of the following subjects:—Physics, Geology, and Physiology.

D

(e) That election to the scholarships be by competitive examination, held annually in July, arrangements for which be made by the Board of Agricultural Studies of the University; the Institution bearing the expense of the examination.

(f) The examination will consist of the following subjects:—

- (1) Elementary Chemistry and Physics.
- (2) More advanced papers in Chemistry, Physics, Botany, and Geology.

No candidate to be allowed to take more than two of the more advanced papers, but every candidate must show an elementary knowledge of chemistry and physics. Candidates who take the more advanced papers in chemistry or physics will not be required to take the elementary paper in the subject in which they enter for the more advanced paper. The examination to include papers and practical work in each subject. The Council have made somewhat similar offers to the Universities of North Wales and Durham—both of which possess agricultural sides—in the interest of students from the Northern and Western districts of the country. The Council had hoped to open the competition for these scholarships to Fellows and professional Associates as well as to students, but their legal adviser is of opinion that to do so would be to infringe specific provisions in the charter and by-laws, and they have, in consequence, been compelled to limit their offer to the last-mentioned. It may be mentioned in this connexion that by way of still further linking the Institution Examinations with the teaching universities, the Council have agreed to accept the Bachelor of Science Degree in the Department of Agriculture in the University of Edinburgh, as qualifying candidates for the professional examinations of the Institution.

The Provincial Committees continue to perform functions of the highest utility in connexion with the general work of the Institution, and the Council gratefully acknowledge their valuable co-operation in the exceedingly difficult duty of investigating and weighing the qualifications of candidates for examination, for election, and for transfer. Reference was made in last year's report to proposals for lectures on suitable subjects to be delivered at meetings of Provincial Committees. The response to these proposals has not been so general as the Council hoped and anticipated, but in those cases in which the suggestion has been entertained the Council are making arrangements for lectures by experts in subjects selected in consultation with the Committees.

Early last winter the Council, to their great regret, were informed by Mr. Rogers that the state of his health rendered it unwise that he should continue to discharge the duties of secretary, and that he desired, therefore, to resign that office as soon as his successor could be appointed. In these circumstances the Council felt that, great as the loss to the Institution must be of Mr. Rogers' services after a connexion with it for some thirty-six years, they had no alternative but to relieve him, as soon as possible, from his duties. The Council decided to appoint, from the date of the general meeting in May, Mr. Alexander Goddard, whose qualifications and experience as Secretary to the President of the Board of Agriculture and in other official positions, appeared to give him a special fitness for the office of Secretary to the Institution. It has been arranged that the wide experience and knowledge possessed by Mr. Rogers in the conduct of the business of the Institution shall be at the disposal of the Council for so long as his assistance may seem to be necessary, and that he shall receive a retiring allowance commensurate with the length and value of his services. The Council desire to express on their own behalf, and on behalf of all the members of the Institution, their warm appreciation of the judgment, energy, literary ability, and unflinching courtesy with which Mr. Rogers has discharged, for so many years, the duties of secretary, and of the value of his services not only to the Institution, but to the profession in general, especially in connexion with the improvement of professional education. The Council gladly acknowledge that the important position now attained by the Institution must be attributed very largely to the efficient way in which the secretarial duties have been performed, and, in bidding an official farewell to Mr. Rogers, they wish to record their sincere regret that his resignation has become necessary, and their strong hope that a well-deserved rest and freedom from responsibility may conduce to his complete restoration to health.

In their last year's report the Council stated

that, on the invitation of the London County Council, they had put forward certain proposals for the amendment of the London Building Acts, which, it was hoped, would sufficiently commend themselves to insure their incorporation in the new Bill then in contemplation. This hope proved to be unfounded, for the new Bill not only proposed to re-enact many of the sections of the 1894 Act, the amendment of which had been suggested by the Council to its promoters, but embodied clauses of such a far-reaching and drastic description as would practically revolutionise existing legislation on the subject. The menace to property interests was so serious that the Council felt they had no option but to oppose the Bill by every means in their power. They therefore prepared and lodged a petition and retained counsel to appear in support of it, but in consequence of the hostility provoked by the Bill, its promoters, as the result of a compromise with the City and other authorities, decided to abandon all but the fire clauses, which, by agreement, were allowed to go to a second reading, and now stand referred to Committee. Any expectation that the withdrawn clauses of the Bill would be permanently dropped must be abandoned, the London County Council having announced their intention of reintroducing them in some form next session. Meanwhile the London County Council have invited the Council of the Institution to make suggestions for the amendment of the existing London Building Acts, and this work is now engaging their attention. The members will need no assurance that the Council will, as heretofore, do what lies in their power to secure property owners against any proposals in the new Bill which may seem to be unnecessary or unjust.

The proposed Government Valuation Bill is awaited with anxiety, as likely profoundly to affect the interests with which all classes of surveyors are closely connected. Directly the Bill of last session was introduced the Council took steps, with the assistance of a Committee, to examine its provisions, and finally embodied their views on the subject in a memorandum which was printed and sent to all the members of the House of Commons. The Bill of 1904 was withdrawn, but, it being understood that the Government would again introduce a Bill on the subject this session, the Committee was reappointed, and their recommendations were forwarded in the name of the Council to the President of the Local Government Board, with an expression of hope that these representations would receive consideration in connexion with the framing of the Bill.

The Council are much indebted to members and others for the large number of valuable and interesting contributions to the current volumes of *Transactions* and *Professional Notes*. The Council have decided to offer non-members as well as members the opportunity of winning the gold medal for the best paper, if of sufficient merit, read during the session.

The Council made a contribution towards the defendant's costs in the action *Gibbon v. Pease*, in which the plaintiff sought to establish a right to the ownership of the materials and papers on which a bill of quantities was based, as well as a right to the ownership of all drawings connected with the contract. The latter the Council regarded as outside their purview, but as regards the former it was felt that Mr. Pease, being a member, was entitled to such support as the Institution were in a position to render; and their action was justified by an agreement between the parties in Mr. Pease's favour on this branch of the case.

On the motion of Professor H. Robinson the report and balance-sheet were received and adopted, and a vote of thanks was accorded to the auditors, who were asked to continue to act in that capacity.

A vote of thanks was also accorded to the President, Vice-Presidents, and other members and Associates of Council, and the President, in reply, stated that the work of the Institution was on the increase, the number of Committee meetings being double what it was in previous years.

A hearty vote of thanks was then accorded to the Hon. Secretary, Mr. Currey, and the retiring Secretary, Mr. Julian C. Rogers. Mr. Currey having briefly replied,

Mr. Rogers said it was a matter of considerable emotion that he found himself practically at the end of his official position as Secretary of the Institution, but if anything could lessen the pain of parting it would be the kind remarks which had been made to him. But he thought

he had received more than his fair share of praise, for it would be impossible for anyone to accomplish the work of the Institution without the efficient services of an able and devoted staff.

A vote of thanks having been passed to the scrutineers, the prizes awarded to the successful candidates in the recent examinations were presented.

The President then introduced the Hon. President and vacated the chair, which was then taken by Mr. Bidwell, who expressed his thanks to the members for having elected him to that position.

The meeting then terminated.

THE QUANTITY SURVEYORS' ASSOCIATION.

THE Annual General Meeting of the Association was held on Tuesday at the Duke's Salon, Holborn Restaurant, Mr. Walter Lastrance, F.S.I., President, in the chair.

It was announced that the following gentlemen were elected on the Council:—Messrs. W. Lawrance, A. J. Gate, H. W. Crickmay, A. G. Cross, R. L. Curtis, jun., H. England, F. B. Hollis, W. R. Hood, H. Curtis-Card, R. J. Toller, W. Hoffman Wood, and A. Harris.

The Chairman stated that Mr. Hollis had retired in favour of Mr. W. W. Barber.

On the motion of the Chairman, Messrs. E. D. Nixon and H. J. West were re-elected Hon. Auditors.

The Chairman proposed the adoption of the balance-sheet, which showed a balance (including 57l. 16s. for subscriptions unpaid) of 228l. 17s.

Mr. C. W. Latter seconded the motion, and the balance-sheet was adopted.

Mr. F. B. Hollis (Hon. Sec.) reported that Messrs. B. S. Smith and E. A. Wyke had passed the final examination for membership, and Messrs. R. F. Chapman and A. Meneard, the examination for students.

Practice of the Profession and Suggested Reforms.

Mr. Camp continued the discussion on Mr. A. G. Cross's paper read before the Association on April 12,* and said he did not quite agree with the author as to angles, but the question had cropped up, where they had a row of shops, as to whether they should allow 4½ in. or 5 in. on the returns. Another point was that if they allowed angles in glazed facings they must allow them in red facings or any other. As to stone-work, he did not agree with measuring labours nowadays. The majority of young estimators at the present day did not price that, but they sent it to the mason, who did the pricing, and he would not measure labours unless it was a very particular job. He would like to raise the question of terra-cotta measurements and glazed work. He had seen it measured in many ways, and had seen it cubed, supered, run, and all ways, but to his own mind he had not seen a satisfactory method. He certainly felt the best way was to super it all, and measure strings and things of that sort by the run. A matter he would like to refer to was that of provisions. They often came across items that the contractor put a large profit on, and they could not deduct that item at all, they could deduct the profit. Lately he had a 500l. on which the contractor had put 100l. profit, but unfortunately he had to allow it under the contract, and he considered it radically unfair, both to the architect and the employer. He felt there should be a general rule amongst all quantity surveyors as to what they could do with an item of that sort.

Mr. G. J. Clarke said he thoroughly endorsed what had been said as to white glazed bricks. If they allowed an extra on white glazed bricks for bonding, then they ought to allow it on red brick or blue Staffordshire brick, or even stock brick. In his own practice he had not taken such an item as run of labour and material. He had always measured 4½ in. of every internal return. As to masons' work there was a serious question, with regard to which there should be much more uniformity in the way in which they took out their bills. He had had thirty years' experience, and was taught to take out his working rule and his own labours, but a change had taken place with regard to masonry. In his young days most builders had a masons' yard, number of masons, but if the

* See our issue for April.

...yards now they would not find many
...the primary cause of this probably
...the Portland stone firms had combined,
...the Bath stone firms had done the same, and
...result was that within a mile of Nine Elms
...South of England, they saw a large number
...of stone yards equipped with splendid machinery,
...and he did not think he was exaggerating
...when he said that 70 per cent. of the City
...buildings faced with stone had that stone
...sourced at Battersea or Clapham. He saw
...no objection to that, and believed that the
...masonry he had seen could produce even
...better work than the builders could who
...employed masons in their own yards. He
...had taken out stone hills cube, and there were
...millions afterwards, and a bother occurred.
...He did now was to take out all special
...cases that required more than the ordinary
...quantity of stone, and describe them, and, if
...necessary, put in a sketch to make it clear.
...The result was that he had always had every
...stone fully priced, and when there was a variation
...in the stone-work his task had been a very
...easy one. Mr. Cross had touched on case-
...ments, and whether it was right to take them
...square or run. In the case of large loop doors
...factories and so on, he took jambs and lintels
...run, but in the case of the ordinary casements
...of a villa he took them super. Contractors
...said they did not care which way they took it.
...He felt that one of the best things they could
...do was to fit in with the builder's wishes as much
...as possible, because he found they could actually
...give out casements for villas at quite as good
...a price as they could ordinary sashes in box-
...frames. He could not quite see what would
...be the outcome of their discussion, unless some-
...thing in the way of a business-like method was
...adopted, and he would suggest that the different
...points arising should be considered by the
...Council, who should give their verdict upon
...them. With regard to the question of fees,
...he thought that the Council had an exceedingly
...difficult task to perform, but he would suggest
...that they should do good things by steps, because
...clearly fees the Council might suggest would
...be taken by the public to be the maximum and
...consequently fees.

Mr. C. A. Kennett said he would like to ask
...Mr. Cross a question with regard to angles.
...He took an extra for the internal angles
...where there were external angles in the building,
...to measure them quite differently. If
...there were only internal angles he agreed with
...Mr. Cross, but if he had external angles he
...should keep them separate. With regard to
...fees, if there was a scale settled it would be
...useful in one way. Sometimes an architect
...whose work they had been in the habit of
...asking them to take a job at a very low
...price, and it would help them considerably
...if they could produce a scale of fees and could
...tell him they were not allowed to take less.

Mr. C. W. Latter asked what was the practice now with regard to measuring branch joints in plumbing. He was taught always to measure the larger joint, if it was a 1½-in. or 2-in. pipe then he would measure the 2-in. joint. Latterly he had met certain Government officials who made it a practice to measure the smaller-sized joint.

Mr. H. J. Kemp, who was allowed by the Chairman to again address the meeting, said, in regard to the 4½-in. wall glazed on both sides, it was the return end which wanted to be paid for. Take a wall between a staircase. It was the end which was never paid for unless they took the glazed facing round it, and then they took too much. He had done it by describing it as a brick wall glazed both sides, and then taking extra glazing for the end, and he had always found it priced. There was another item of a 9-in. wall glazed one side. They might have a glazed facing and a side facing. That some surveyors would describe with other facings, and another man would take the extra labour and waste on it. Personally, he always took extra labour and waste. In many cases builders had questioned the item as to what it meant.

Mr. W. Hoffman Hood said he felt the paper was a little egotistical. Mr. Cross believed in the London practice, and he said that, although superior to any other practice, it was not perfect and uniform. He believed Mr. Cross was as good a surveyor as anyone in the room, but he objected to the statement that the London system was better than the provincial system. The matter of glazed brick facing had been touched upon by a good many, but a great deal

depended on the position one took himself. If they measured their work net they must measure it net, but if they measured it where it was not net then they must describe it as it should be described. The architect would allow them to run the glazed brick facing of a wall and not let it be bonded at the angles, and whatever the builder built they must measure and pay for. There was no doubt as to the angles; if the glazed brick was to go into the wall they paid for it. Then, with regard to the question of the quantity surveyor, whether employed directly by the architect or the owner, being the agent of the owner, he felt when he was employed that he did not care for either, but he tried to act fairly between the two. He did not see the slightest objection to the builder paying him his commission. The architect virtually was their client, and, although it was all very well to say the building owner ought to know, they had to take things as they were, and he was for them to go behind the architect and tell the owner that the builder was paying for the work, and was the usual force, and they could not alter it. The general average of buildings cost about 2,000*l.*, and they would have about twenty builders contracting. Nineteen of these were unsuccessful, and so the builder had to price up about nineteen bills of quantities before he was successful in getting one. In the bills prepared by some of the most celebrated quantity surveyors in London they saw page after page with no money items at all, and with many items which were so small that they did not pay for the cost of measuring. Why should a builder waste time in pricing out page after page of items which were of no value whatever? The London system theoretically might be perfect, but there was something to be said for the massing together of items so that every item in the bill of quantities was priced out. In the provinces they massed things together more than was done in London, but the builder was not doing, and knew that if he missed a single item he was money. He did not believe there was much to be made out of putting, for generally a man who was known to do good work would get the job. As to fees, he was rather inclined to ask for a maximum scale than a minimum scale.

Mr. L. E. G. Collins said the only point in favour of measuring any allowance for internal angles was because it was an expensive item. He did not think it a good principle. What was the right way of measuring one sort of facing should be accepted as the right way of measuring another sort of facing.

The Chairman said that, as to a uniform system of measurement, he had from that chair already expressed his opinion that they should try and obtain it. He believed it would first be necessary to try and get the best points of every system and join them, with the London system as the basis. He was afraid, however, that it would not be such an easy matter. He felt that the measurement of stone was one of the most important points which had arisen, but he felt there was no question whatever as to the correct way of doing it. He believed that the old-fashioned method of measuring stone and labours was the correct way, but as men of the world they knew it was not always expedient to be correct, and when they had a large stone job before them they had to think beforehand of the class of builders likely to be competing for the work. It was the first object of quantities that they should be such that the competing builders could arrive at the closest prices. He considered that to advocate the abandonment of the measurements which had been on stone would be a very unwelcome thing to regard the younger surveyors. They found a good many of the younger surveyors who came into their offices had no idea of the measurement of labours on stone, but they should see that every surveyor who wished to pass as a quantity surveyor should be competent to measure these labours when necessary. Personally, he found that London contractors did not generally price these labours. He believed the bills went down to the quarries, and they did take note of these labours. With regard to extra hoisting, he believed that most of them measured that on most things where it was necessary to do so. The builder when he was preparing his estimate judged as to the amount of scaffolding and plant required for a particular job, and that, he took it, was the item under which the question of hoisting was considered. As to the question of angles, they had had representative London surveyors in disagreement with one another,

but in his opinion nearly everyone had missed the main point. If he might be allowed to discard the question of pointing and to take it that the facing was worth 2s. 6d., they might take it that 4½ in. represented $\frac{1}{16}$ in. or 9d. But if they allowed that for internal angles, what were they going to do with regard to external angles? The external angles were not worth an extra; they were worth $\frac{1}{16}$ in. less, if they measured the facings all over, and so, if they were going to measure the internal angle as an extra, they must also measure the external angles as a deduction. If, therefore, building had somewhere about the same number of internal and external angles, it was obviously unfair to leave both out than to deal with one and not the other. Therefore, he considered that the old-fashioned system of measuring angles net was more correct than measuring one and not the other. Of course, the surveyor should always have the right to his own opinion, and if he found that his building was of such a plan that the internal angles were predominant and excessive, then he would make an allowance. On the question of facing both sides, he felt unless the wall was over 9 in. thick it was absolutely necessary to measure it as being faced both sides. A question had been raised as to the publication of instructions as to the correct mode of measurement, but he felt that the young surveyor had enough theory and practice to learn more from experience than some appeared to be able to do. At the same time, he felt the question could be settled amongst themselves and issued to members as a private and confidential paper. The matter had been raised by Mr. Cross of altering clause 12A in the conditions of contract so as to allow for omissions. At present the Royal Institute of British Architects refused to alter the conditions, but he felt it was desirable to have those words inserted. He considered it was best in private work for the architect to appoint his own surveyor, but in municipal work and competitive work it was only fair that the same body which appointed the architect should appoint their own surveyor. He felt very strongly about the settling of pensions on private work, and where they did answer to pensioners they ought to quote a respectable fee. The Council had been engaged for some time on the matter of fees, and he thought they would have to exercise their patience some time yet before a scale was produced. As to terra-cotta, he had always found it measured cube. He had never heard of a builder being able to claim profits on provisional amounts if a proper clause was inserted in the contract as to these provisions. Mr. Wood had raised the question of lumping a lot of jobs, but items which might be small in one job might be very important in a 15,000-lb. job. He entirely disagreed with sharing fees with architects. The best surveyors were usually amongst the best surveyors. It was most immoral, and like the offer of commission contained in an advertisement in the *Builder* a few weeks ago, which the Council had dealt with.

Mr. Hood said he entirely agreed with the Chairman as to glazed brick facings. With regard to joints in plumbing, there were certain special joints which surveyors should take into consideration. Where the joints came through the wall they should be measured, because in large buildings with a great many fittings that ran into a considerable amount. He was opposed to the quantity surveyor writing specifications, for it was the duty of those who prepared the drawings.

The vote of thanks was then carried and Mr. Cross briefly responded, and remarked that the President had replied to nearly every point raised.

Mr. Gate moved a hearty vote of thanks to the President for his services during the year, and this was seconded by Mr. R. J. Tollit and agreed to.

The Chairman, in reply, thanked the members for their support, and said he believed that solid foundations of an Association had been laid. He also proposed a hearty vote of thanks to the Hon. Secretary for his devoted labours.

Mr. H. Wood seconded the motion, which was carried, and Mr. Hollis having briefly replied, the proceedings terminated.

BROWNE MONUMENT, NORWICH.—On the tercentenary, October 19, of the death of Sir Thomas Browne, will be unveiled in the Haymarket, Norwich, the statue which is now being executed by Mr. Henry Pegram, A.R.A.

15, York-buildings, John-street, Adelphi
(Messrs. J. Allen & Sons, Ltd.).—Refused.

Conversion of Buildings.

Holborn.—The reconversion into a dwelling-house of a portion of No. 5, Little Saffron-hill, Holborn (Messrs. H. P. Tasker & Slater for Mr. L. Viazani).—Consent.

The recommendation marked † is contrary to the views of the local authority.

ARCHITECTURAL SOCIETIES.

THE ARCHITECTURAL ASSOCIATION OF IRELAND.—The last general meeting of the session was held at the rooms of the Association, Frederick-lane, on Tuesday evening, May 23, Mr. Jas. H. Webb in the chair. The walls of the Lecture Hall were covered with drawings, the work of various members. The minutes of the previous meeting having been read and signed, the result of the ballot for officers for the ensuing year was announced as follows:—President, Mr. H. Allberry, A.R.I.B.A.; Vice-Presidents, Messrs. F. Hayes and G. F. Beckett; Committee, Messrs. C. H. Ashworth, F. G. Hicks, J. H. Webb, A. G. C. Millar, C. H. Mitchell, G. P. Sheridan, R. M. Butler, C. J. McCarthy, J. Holloway; Hon. Treasurer, Mr. Edwin Bradbury; Hon. Librarian, Mr. G. G. Lynce; Hon. Secretaries, Messrs. H. G. Leask, Lucius O'Callaghan; Hon. Auditors, Messrs. D. Boucher, C. Ramsey. The prizes won by the members in competition during the session were distributed by the President, the winners being:—Institute prize, Mr. H. G. Leask; the Association Travelling Studentship, Mr. H. T. O'Rourke; special prize presented by Mr. A. E. Murray, F.R.I.B.A., Mr. D. Boucher; the President's prize, Mr. A. W. Reid; the Vice-President's prize, Mr. W. Stainer. History Class—1st, Mr. H. J. Lyons; 2nd, Mr. J. W. Beckett; special, Mr. T. F. Strahan. Construction Class—1st, Mr. T. F. Strahan; 2nd, Mr. P. Münden. Class of Design—1st, Mr. A. W. Reid; 2nd, Mr. J. W. Beckett. The President then read his address, in which the growth of the Association and the increasing enthusiasm of the members were referred to, and also the amount of work executed by the junior members for the various prizes, with the result that the standard of draughtsmanship in Dublin was sensibly improved. The newly-elected President was moved to the second chair, and a hearty vote of thanks to Mr. Webb for the work he had accomplished during his year of office, proposed by Mr. F. G. Hicks, and seconded by Mr. Hudman, was enthusiastically carried. A vote of thanks was also passed to the retiring Hon. Secretary, Mr. Frederick Hayes; the Hon. Librarian, the Hon. Treasurer, Mr. Bradbury; and the Class Secretaries. The proceedings then terminated.

FIRE PROTECTION FOR LONDON.

SIR HENRY AUBREY FLETCHER'S Select Committee of the House of Commons commenced its consideration of the two Bills which are before Parliament this session for the amendment of the law relating to the precautions to be taken to ensure escape from fire in London, on Tuesday last. The two Bills are promoted respectively, by the London County Council and the City Corporation.

The Chairman of the Committee, at the opening of the proceedings, asked Sir Ralph Littler, K.C., if he would explain briefly in what way the two Bills clashed. He understood that the two Bills were opposing Bills.

Sir Ralph replied that the two measures clashed only so far as the London County Council's Bill attempted to deal with property in the City. The City Corporation were being opposed by the London County Council, but that was the only opposition there was to their Bill. He thought that it would be the more convenient course if the Committee would hear both the Bills before giving any decision.

Mr. Wedderburn, K.C., said that there were no opponents to the City Bill except the London County Council, but there were a large number of opponents to the London County Council's Bill.

Other counsel having concurred, the chairman asked Sir Ralph Littler to proceed with the case for the City.

In opening the case Sir Ralph remarked that the Bill was really the outcome of the serious fires, which resulted in loss of life, in Queen Victoria-street in 1902, and that at Duke's Head-passages in 1904. In 1905 the London County Council brought up a Bill to deal with the matter, but it met with so much opposition from owners of property within the City that it was withdrawn. After the fire at Duke's Head-passages the Corporation last year suspended standing orders so that they might bring up a Bill at once. They failed in that attempt, however, as their application

was too late. The result was the Bill now before that Committee. Clause 4 of the Bill provided that every existing house or building within the City should, within a period of one year from January 1, 1906, be provided with a stairway or other suitable means of communication from the uppermost floor to the roof thereof, and from the roof thereof to the roof of one of the buildings adjoining; or other adequate means of escape from fire to the satisfaction of the Corporation. Such stairways or other means of communication to be of a permanent character, and be constructed and kept used solely as a means of escape from fire, marks of direction to be provided. Continuing, counsel said that the Corporation took power to serve notices on owners requiring them to construct such means of escape, and the Bill provided also for the affixing of stairways, etc., to adjoining premises. By clause 9 it was provided that the act should not extend or apply to factories or workshops as defined by the Factory and Workshops Act of 1901, nor to any building as defined by section 5 (sub-section 6) of the London Building Act, 1894, exceeding 60 ft. in height. In conclusion, Sir Ralph said that the Bill was entirely the outcome of the finding of the jury on the Duke's Head-passages fire. The Bill was not opposed by any owner of property in the City.

Mr. A. Morton, Chairman of the Streets Committee of the Court of Common Council, was then called, and bore out counsel's opening statement.

Cross-examined by Mr. Bush, K.C. (for the London County Council), witness admitted that the Bill did not contain any retrospective powers. He considered that access to the roof where that was possible was all that was necessary. The surveyor would decide when such access would not be suitable.

By the Hon. Evan Charteris (for the East India Dock Company): If the dock warehouses were sufficiently safeguarded against fire, they would not be interfered with. He could not agree that the dock buildings should be struck out of the Bill; if one class was exempted, another class might wish to be exempted also. There might be persons living in the warehouses.

At the conclusion of the promoters' case, the Hon. J. D. Fitzgerald, K.C., addressed the Committee on behalf of the opposition of the London County Council. He contended that the London County Council were the proper authority for dealing with this matter. To have dual authorities would be to create many difficulties, and he mentioned a report by the Home Secretary in which it was stated that it was a question whether it was desirable, having regard to the fact that the London County Council were the existing fire authorities, and also that, under the City's Bill, the Corporation would have no control over buildings which were partly factories, that a dual authority should be constituted.

Mr. W. E. Riley, the Superintending Architect to the Council, was then called, and dealt in his evidence with the existing law on the subject. He considered that an escape to the roof would be quite inadequate to meet the case of a burning building. A trap-door from the upper floor, with a staircase from it, would, he thought, meet the requirements, so would a staircase from any other part of the building. The City Bill did not make any provision for escape from the intermediate floors. Under the existing Act all floors in a building above 60 ft. from the ground had to have alternative means of escape.

Captain Hamilton, the Chief of the Fire Brigade, said that, if an inside staircase was adopted, it would be necessary so to construct it that it would not form a flue. In the case of a small building the staircase might lead from a specially-built room. In the case of a large building an additional escape should be provided.

On Wednesday Sir Ralph Littler replied for the City Corporation. It was the desire of the City to be reasonable and practicable, and the Bill which they were promoting had met with the almost unanimous approval of the companies and other owners of property in the City. The only exception was the London and India Dock Company. The night population of the City was an infinitesimal one compared with the day population, and the night population was constantly decreasing, while the night population in all the other parts of London was rapidly increasing, as was shown by succeeding censuses.

The Hon. J. D. Fitzgerald, K.C., then opened the case for the L.C.C. Bill. He traced the history of the various Acts which culminated in the 1894 Act, and said that in 1904 the London County Council introduced a Bill, but it met with so much opposition that it was withdrawn. When the Bill of this year came up for second reading it was agreed between parties that the second reading

should not be opposed on condition that the Council should drop that portion of the Bill which referred to the Act of 1894, with the exception of those clauses dealing with the provision of means of escape from fire. Mr. Fitzgerald read extracts from the report of the Home Secretary, in which the opinion was expressed that an amendment of the law was necessary. Most of the petitions which had been presented against the Bill dealt with the portions of the Bill which had been cut out. With regard to the petitions which remained, Mr. Fitzgerald said that mainly they dealt with the possibility of the Act involving property owners in expense.

Mr. Freeman, K.C., addressing the Committee on behalf of Messrs. Rubchild and the bankers in the City, suggested that the same course should be taken in the case of this Bill as was taken in the case of the Building Act of 1894—namely, that consideration should be given to each clause separately. The opponents could then hand into the County Council their objections, and the County Council would have them printed and submit them to the Committee.

The Hon. J. D. Fitzgerald pointed out that, while that course might be desirable, it would be better to allow counsel who were opposing on preamble to cross-examine his witnesses. He knew that in the end the Bill would have to be discussed clause by clause.

Lord Robert Cecil, K.C. (for the Duke of Westminster and other opponents), said that he wished to have an opportunity of cross-examining on preamble.

The Committee having decided to proceed with the preamble of the Bill.

Mr. W. E. Riley, the Architect to the London County Council, was called, and said that since the London County Council had been in existence they had obtained two Acts relating to buildings in London—those of 1894 and 1898. All the fire statutes of London were vested in the Council, who were also the authority for enforcing the provisions of the Factory and Workshops Act. The Council had found that the existing fire statutes were insufficient to deal with the fire risks in existing buildings. They had powers over new buildings, but their powers over existing buildings were very limited. In the case of theatres, however, the County Council could have an inquiry made and order the provision of means of escape, although in the case of an old theatre the owner always had a right to appeal to arbitration. In the case of theatres they had had three appeals since he became architect to the Council. They also had retrospective powers in the case of common lodging houses and factories and workshops where more than forty persons were employed. Old buildings erected since 1855 and the more modern old buildings erected since the passing of the Act of 1894 had to be accepted as they stood, and that fact constituted a great peril.

The witness had not concluded his examination-in-chief when the Committee adjourned.

METROPOLITAN ASYLUMS BOARD.

THE usual fortnightly meeting of the Managers of the Metropolitan Asylums District was held on Saturday, last week, at the offices of the Board, Victoria-embankment.

Among the correspondence received was a letter from the Local Government Board sanctioning the expenditure of a sum not exceeding £200, on the provision of fire alarms at the Northern Hospital, the carrying out of alterations to the windows at Levensden Asylum, and the making of additions to the coal stores at the North-Western Hospital.

Joyce Green Hospital.—On the recommendation of the Finance Committee it was agreed to apply to the Local Government Board for sanction to the expenditure of £1,000 on the provision of additional bedrooms, etc., at this hospital.

Levensden Asylum.—It was also agreed to apply to the Local Government Board for sanction to expend a sum of £180 on the conversion of some of the ordinary blocks at this institution into infirmary accommodation. Plans of proposed irrigation works including sewage disposal scheme on land recently acquired at this asylum, were approved and forwarded to the Local Government Board.

Belmont Asylum.—On the recommendation of the Works Committee it was agreed to apply to the Local Government Board for sanction to the expenditure of £1,000 on the supply of laundry fittings, heating apparatus, etc., at Belmont Asylum.

New Central Stores.—Plans of the proposed new central stores to be erected at Peckham Rye were approved and submitted to the Local Government Board for sanction.

Millfield House.—The plans prepared by Messrs. Rowland Plumb & Horner for the

condition of this home for the treatment of persons suffering from diseases of the lungs is approved, and the Works Committee were directed to take steps to carry out the work. The plans provide for the provision of a sun-room between two of the four blocks, 52 ft. in length by 25 ft. in width, divided into two parts by a folding partition, so that on sunny days it can be thrown entirely open, while on rainy days it would be used one-half for boys and one-half for girls. The room is approached from both ends from an extension of the verandah on the ground floor. The greater portion of the frontage on the south side is left open, but provision is made for closing the shutters to enclose the same during inclement weather. Windows are also placed on the north wall so that cross-ventilation can be maintained in mild weather. It is proposed to remove the remainder of the existing verandahs in front of the two blocks C and D, between which the sun-room will be placed. These verandahs are very narrow and ornamental. In their place iron columns will be carried up to support new verandahs 8 ft. wide, projecting from the frontage on the first floor. The bay on the ground floor will be carried up to the story above, and in each case the verandah will extend from the bay to the end of the building. A lavatory, with four basins, will be placed at the end of each verandah. The total cost of the work will be about 3,000l.

Correspondence.

CONCRETE PUGGING FOR FLOORS.
 Sir.—The correspondence now proceeding in our columns is of much interest and value, particularly at the present time, when a question was before Parliament to make a floor constructed of wooden joists filled in with concrete legally a fire-resisting floor for all purposes.
 A floor constructed on such lines is most scientific. No one of experience can have failed to observe that the longevity of timber depends largely upon efficient ventilation. Many of the failures of brick walls are attributable to the fact that bond timbers and wall plates have been built into the wall; these timbers shrink and rot, causing the walls to flange outwards. I have for this reason for many years past done all I could to discourage the building of timber into walls and other places where ventilation cannot be maintained. Reference to the building laws of Montreal will show that Canadians are well alive to this danger, and, therefore, prohibit the building of bond timber into all walls, except only as lintels of small span.
 Within the last week the matter has again been forced upon my notice by certain works now in progress in my district. The building in question was erected in September, 1878, and some timber joist ends and wall plates were embedded in cement concrete; upon their removal last week for certain alterations they were found to be completely rotten*; the situation is perfectly dry, and, except for the concrete, only well ventilated.

I entirely agree with Mr. Payne that a rugged floor should not be accepted as a fire-resisting floor, excepting in the case of old buildings where it becomes necessary to render an existing floor fire-resisting to comply with Sec. 74 (2) of the Act, and even then only provided certain precautions be taken, viz., that the concrete be as low as the bottom of the joists, that the fillet be protected by the concrete, that the underside of the joists be protected with metal sheathing and plastering, and that the concrete be porous to allow, as far as possible, a passage of air through it to the wooden joists. In the case of an existing building some consideration may be shown on the score of cost, which might be very heavy were the whole floor, possibly supporting partitions, to be removed to be replaced by one of steel and concrete; but no such consideration is necessary in the case of a new building where there are no such existing elements. The chances of rot would be greater in a new building where the timber is wet, and frequently only partially seasoned; the timber in an old building is at least dry and seasoned. A floor that I have had used in old buildings with success is constructed as follows:—A fillet (preferably triangular if of wood) is nailed on the sides of the joists some 2 in. from the

* Mr. Dicksee encloses some bits of the wood; they are not well timber, and can be rubbed into dust between the fingers.—Ed.

soffit; if this be of angle iron and arched on the joists considerable extra stiffness will result; to the soffit of the joist expanded metal lathing is securely nailed or stapled, the concrete (composed of coke breeze 2 parts, broken brick 2 parts, Portland cement 1 part) is then filled in upon the lathing, which acts as sufficient centring until the concrete is set, when it takes its bearing on the fillets; the ceiling is then plastered on the metal lathing. A floor constructed on these lines, except that the concrete also extended under the joists for a thickness of 2 in. (an expedient that would doubtless increase the fire-resisting capabilities of the floor, though it would also increase the chance of rot) was tested by the British Fire Prevention Committee in March, 1900, and withstood the maximum test of two hours' fire, though the joists were found to be all more or less damaged by fire. Other floors with the concrete flush with the soffit of the joists have also been tested; one with a match-lined ceiling fell during the test on the application of the water after a fire of 1½ hours; the other, with a plaster ceiling, survived the two hours' test, but fell shortly afterwards; the first two floors were loaded with 100 lb. per ft. sup., but the third floor was unloaded.

Apart from the question of the liability to rot, the floor provided for in the new Bill, and that suggested by Messrs. Holman & Goodrham display the same defect, that there is no protection afforded to the lower edges of the joists, the most vulnerable part; it would be possible to have in the case of 11-in. joists the lower 6 in. of the joist entirely unprotected; doubtless most persons would add some sort of ceiling, but even this is not demanded in the Bill.

It is, in my opinion, most desirable that the law should not be altered so as to permit the use of wood floors pugged with concrete as fire-resisting floors in new buildings or new additions, as such a course must inevitably lead to disaster; but such floors should only be used in the exceptional case of old buildings, and then only when the main principles I have set out above are observed. I also think it undesirable to stereotype any particular method of construction in an Act, as such a course must lead to the exclusion of improvements; the fullest latitude should be allowed to the District Surveyor.

BERNARD DICKSEE.

COUNTY BOUNDARIES.

Sir.—Permit me to appeal to all who reverence the evidences of our country's story to oppose the Local Government Board's attempt to obtain Parliamentary sanction to a drastic alteration of county boundaries. Though the county of Essex is apparently to be the only sufferer on this occasion, the question is one which affects the whole country.

The petition presented to the Local Government Board by my Council explains the position, but in addition I would point out that the order will in this case alter bounds existing since pre-Roman days, and all for the sake of the Poor Law which may at no distant date be amended.

Geo. PATRICK,

Hon. Secretary,

British Archaeological Association.

Copy of petition referred to above.

"The President and Council of the British Archaeological Association have heard with extreme regret of the proposal of the Local Government Board to remove ten parishes from Essex to Hertfordshire by altering the county boundary which has existed for a thousand years, thus destroying the landmarks of history."

It is respectfully suggested that the requirements of the Poor Law administration can be met by financial arrangements between the two counties, and that in any case the ancient county name of Essex be retained. Should this transfer be accomplished a like re-arrangement may follow all along the border-land of the county, and it appears to your petitioners that as a large part of England is subject to similar conditions, the matter should be dealt with as a whole, rather than that our county should be selected for sacrifice."

ELECTIONS TO FELLOWSHIP OF THE INSTITUTE.

Sir.—In connexion with the recent protest from Leeds on this matter, several letters have reached us from correspondents, who have urged us to take the protest to its logical conclusion by demanding a ballot for all the twenty-three candidates who have not qualified by examination.

We at Leeds seriously considered the adoption of this course; but would you permit us to state in your columns that it was ultimately concluded that if we dealt with candidates from our own district who were known to us it was the duty of members of the Institute in London and in other centres, to take similar action in

reference to men with whom they were better acquainted than we can be.

Having commenced the movement here, we feel sure, from the widespread expressions of strong feeling we receive, that our colleagues in London and other centres will share the work with us, and not expect Yorkshire to bear all the brunt.

May I, in conclusion, point out that, as the election of the candidates on Monday next is by show of hands, as stated in by-law 9, those who will make a point of attending the meeting and voting will be able to express their opinion of the claims of these gentlemen in the most practical way.

FREDK. MUSTO.

Leeds, May 31.

Sir.—That there should be so much indignation expressed by provincial Associates against the great influx of members by direct election to Fellowship is only what was to be expected.

The great aim of the Council appears to be to obtain as many names as possible for nomination, no matter what the capabilities and standing of the architects may be who are seeking election.

The architectural designs prepared and carried out by many of the provincial architects who have become members by direct election to Fellowship are neither creditable to themselves nor to the Institute which they represent, and do not stamp the designers as being worthy of the honour of election.

More discrimination should be shown in the selection of names for nomination, and only those architects of exceptional ability or Associates who have passed the examination should be elected to Fellowship. W. BARTON.

RADIANT HEAT AND CONVECTION.

Sir.—Referring to your interesting note "Radiant Heat" in your issue of the 20th ult., you attach "great practical value" to the radiant heat thrown out by hot-water pipes or "radiators," and you state that, of the total heat given out, more than half is by radiation.

In the fifth edition of Hood, pp. 243-4, it is noted that, "at the ordinary temperature of hot-water pipes, about one-fourth the total cooling is due to radiation." Professor Carpenter states that "the construction of the ordinary form of radiator presents very little free radiating surface, as all the heat which impinges from one tube or another is radiated back, and is consequently not of use in heating the apartment. The greater portion of the heat is no doubt absorbed by the air which comes in contact with the radiator, or, in other words, it is removed by convection."

In addition to these facts, a radiator is generally placed against a wall (it is not necessary to point out the disadvantage of doing otherwise), and pipes are placed in the angle formed by the wall and the floor, so that in practice a great proportion of the total radiant heat thrown out is received by the floor and the wall, from whence it is sent part transferred to the air by convection, in part re-radiated back to the pipe or radiator, and to some slight extent is carried away by conduction.

Further, as the intensity of radiant heat is inversely as the square of the distance, the temperature of the rays from a pipe at 200 deg. Fahr. are for practical purposes soon lost in space.

Even under the London Building Act hot-water pipes may be within 3 in. of timber, and are often, in fact, put in actual contact with it, and if, as mentioned in your note, the temperature is so low as not to scorch dry paper at a few inches distance, it is difficult to realise its great "practical value" in warming "persons, furniture, and other objects in the room."

The practical value of heating by hot water and steam, etc., is not due to radiation, therefore, but to convection; you could not even warm your hands at a radiator except by this latter means, or by actual contact with the metal; although it is easy to keep warm at a fire in an open field. A tumbler will hold water, but it would be weary work to drink out of it.

T. J. CODD.

Metropolitan Asylums Board, Victoria-embankment, E.C.

** We certainly do attach much importance to radiant heat, which, however it may be furnished, always increases the comfort of those in the apartment warmed, and, to some extent, helps the general process of heating a building by warming the walls. In the example of a 4-in. pipe, it is undoubtedly the fact that more than half the total heat is emitted by radiation, and if radiators of suitable design be employed, very similar results may be obtained.

* We feel sure that our correspondent is quite right taken in this idea.—Ed.

especially where steam is used as the heating medium. By radiators of suitable design we mean those in which the surfaces are not closely grouped in clusters, but are separated sufficiently to permit most of the heat rays to escape freely. The remark of Professor Carpenter, quoted by our correspondent, evidently applies to radiators of undesirable design, as shown by the following extract from p. 76 of his treatise:—"The radiating surface ordinarily employed for steam or hot-water heating consists of a number of pipes closely grouped together so as to occupy as little space as possible." Of course, it follows that the closer the grouping, the greater must be the interception of radiant heat. The moral is, that radiators should be of moderate depth, and with the sections at a reasonable distance one from the other. But even admitting the sections to be grouped so closely that only 25 per cent. of the total heat is emitted by radiation, it would be inaccurate to say that no radiant heat is given out, or that what is emitted has no practical value.—Ed.

A QUESTION OF A BUILDER'S CLAIM.

SIR.—Is there any time limit—besides the Statute of Limitation—within which a builder must make his claim to any balance due to him under a contract, or otherwise would be estopped from recovering any balance due to him?

An authoritative answer would be much esteemed. ONE IN DUBT.

Illustrations.

WALL-PAPERS BY VARIOUS ARTISTS.

THESE are reproductions from some of the papers recently made by Messrs. Jeffrey & Co., selected by us as the best out of a number of examples lent at our request by the firm.

The "Sorrento" Frieze (A) is from a design by Mr. W. J. Neahy. The employment of something approaching to a natural landscape for the frieze of a wall-paper (though it is very conventionally treated in detail), may seem at first sight rather at variance with true decorative principles; but the fact is that some friezes of this type, if the lines are well designed, look exceedingly well when fixed, and give a suggestion of nature without being imitative; we have one in a room frequently occupied, made by the same firm (we forget by what artist), which, having objected to it at first on principle, we have come to like very much.

The "Oak" frieze, border, and filling (B B), all of which go together as part of one design, are by Mr. Walter Crane. The "Dulce Domum" (C) is also by Mr. Crane; and the fine bold scrolls of the "Arnheim" (D) are due to Mr. J. W. Turner.

THE HALL, HENGRAVE, SUFFOLK.

THE illustration shows the Hall of this historic house as restored by Messrs. Davenport and Tapper, as joint architects.

The date of the existing house is 1520. The Hall occupied nearly the whole of the north side of the quadrangle. Towards the end of the XVIIIth century the then owner considerably altered the existing buildings for the worse. Amongst other things he pulled down the internal walls of the Hall, and converted it into servants' offices, leaving only intact the south side with its great vaulted oriel window.

The reconstruction mainly consisted in removing various partitions and an intervening floor, putting an open hammer beam roof, panelling the walls, and erecting a musicians' gallery upon what may be approximately considered its old lines.

NEW BUILDINGS FOR THE LONDON SALVAGE CORPS.

THE proposed new buildings of the London Salvage Corps, of which we give an illustration, are intended to occupy a site, part of which is identical with the present premises of the Salvage Corps.

A large portion of the ground floor is necessarily occupied with the stand-room for the Salvage Corps' plant. At the rear of the site are the stables. The basement is mostly taken up with accommodation for the men of the Salvage Corps, who also have a large dormitory on the mezzanine, from which there will be an approach to the watch-room by a sliding pole. In the upper portion of the premises there is a residence for a chief officer, as well as

accommodation for three married men in the Salvage Corps' service. The second and third floors are taken up by the rooms for the Fire Office Committee, who will have on the second floor a large meeting hall of rather unusual shape. It is an octagon with a ceiling of convex form. The exterior elevations will be entirely of Portland stone. The design of Mr. Paul Waterhouse was selected in a limited competition.

SKETCHES IN LANCASHIRE AND YORKSHIRE.

HALL-TH-WOOD, which is situated on the outskirts of Bolton, will always be famous as having been the residence of Sam Crompton, the inventor of the spinning mule.

It is an interesting and picturesque building, and was erected partly in 1591, and the remainder in 1648. Adjoining the south porch is a beautiful oak staircase, the balusters and newels being well proportioned and of good design. The buildings now belong to the town of Bolton, and are fitted up as a museum, containing some interesting furniture of the XVIIIth and XIXth centuries.

Of the many old gateways and posterns remaining in York the one at Fishergate is perhaps the best proportioned, and reminds one of some of the old mediæval towers to be found on the Continent.

The red tower, near Fosse Island's-road (see separate cut), is very picturesque with its red-tiled and hipped roof. The brickwork, which is of the XVth century, looks very well, the bricks being about 10 in. long and 2 in. thick.

Chetham's College, Manchester, was founded by Humphrey Chetham, a member of a family of considerable antiquity in Lancashire, and who was born at Crumpsall. He died in 1653, and was interred at the east end of the north aisle of the chancel, in Manchester Cathedral, a handsome marble monument marking his resting-place. The buildings are used as a public reference library. They are in an excellent state of preservation, and the cloisters, of which a sketch is given, is the most interesting portion of the College, which has been little altered from its original state.

W. EATON.

COMPETITIONS.

PUBLIC LIBRARY, RADCLIFFE.—For the Radcliffe Public Free Library to be erected in Standlane, forty-eight sets of drawings have been received from architects in open competition. The committee has appointed Mr. G. H. Willoughby, F.R.I.B.A., of Manchester, to act as assessor.

BOOKS RECEIVED.

CONCRETE-STEEL: A TREATISE ON THE THEORY AND PRACTICE OF REINFORCED CONCRETE CONSTRUCTION. By W. Noble Twelvetrees. (Whittaker & Co. 6s.)

ENGINEERS' TURNING, IN PRINCIPLE AND PRACTICE. By Joseph Horner, A.M.I.Mech.E. (Crosby Lockwood & Son.)

ROYAL ARMY MEDICAL CORPS MEMORIAL.—The memorial to members of the corps who fell in the South African war, 1899-1902, which the King unveiled on the Stanhope Lines, Aldershot, on May 24, is the joint work of Mr. Goscombe John, as sculptor, and Mr. Weir Schultz, as architect.

HOWELL'S SCHOOL, LLANDAFF.—The recent addition which has been made to this school was opened by Lord Tredegar on the 20th ult. The new building lies at the back of the main block and has been erected by Mr. G. E. Halliday, Cardiff, at a cost of about 2,700. It contains a chemical laboratory to accommodate sixteen students, and a physical laboratory for twenty-one students. There is an art-room 35 ft. long by 18 ft. wide, and there are also a modelling-room, photographic dark-room, and store accommodation. The new block is accessible from the main buildings by means of a glazed covered way, and it has been heated and ventilated on the plenum system.

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE AND STEEL.—XXII.

TWO COLONNET SYSTEM STOREHOUSES (continued).

FIG. 148 shows the general arrangement of the beams in the second storehouse at that level.

The dimensions of the columns were stated last week, and it will be remembered that, with the exception of the type G columns, the sections are the same as in the lower portion of the building. Along the front and back walls the columns K and H are connected by wall beams measuring 16 centimetres wide by 41 centimetres deep, these members being monolithic with the columns and receiving intermediate support from the small 15-centimetre square stanchions between the columns in the story below. The beams at each end wall are 24 centimetres wide by 40 centimetres deep, these also having intermediate support from 15-centimetre square stanchions, except in the three centre spans.

The main beams perpendicular to the longitudinal axis of the building are 30 centimetres wide by 78 centimetres deep, those at the front and back having the clear span of 11.825 metres, while between the longitudinal rows of columns G the clear span is 3 metres. All the secondary beams have the dimensions of 16 centimetres wide by 26 centimetres deep.

Over the whole beam system a concrete-steel floor slab is formed, in which two openings, 1.50 metres square, are left over each tank on the floor below. Thus there are sixteen openings in all. The thickness of the floor slab is 8 centimetres, but along the gangways, or passages, running from end to end and from side to side of the building the thickness is increased to 9 centimetres. The stairways leading up from the story below and to the terrace roof above this floor are situated in the longitudinal passage, but are not shown in Fig. 148, as they occur in the opposite half of the building.

Figs. 150 and 151 contain details of a type H column and the main and secondary beams connected therewith, and Fig. 152 gives similar details of the construction in connexion with a column of type G.

In the lower drawing of Fig. 150 we have a transverse section showing the vertical reinforcement in the column, consisting of four steel bars of 42 millimetres diameter, one at each corner, and two bars of 20 millimetres diameter, all six bars being placed within about 20 millimetres of the outer surface of the concrete, and tied by transverse spiral hoops of 6-millimetre diameter wire. The same drawing shows small portions of two 16-centimetre by 40-centimetre beams, and a portion of one 30-centimetre by 78-centimetre main beam. The reinforcing bars of these members meet in the column and are directly connected by the concrete.

Further details of the beam construction are given in the upper drawing of Fig. 150 and in Fig. 151, where it will be seen that the longitudinal reinforcement of the wall beam consists of two 18-millimetre diameter bars, one 40 millimetres above the lower surface of the concrete, and two 14-millimetre bars situated in that part of the construction heretofore described as the floor slab. But in concrete-steel construction no distinction can be made between the projecting leg of a beam and the floor slab above and on either side of it, because what is generally termed the floor slab for the convenience of description is really a monolithic compression flange for the whole system of beams below. Fig. 151 shows that the four bars of longitudinal reinforcement in the wall beam are connected by vertical loops of steel wire, 6 millimetres diameter, for withstanding shearing stresses, and that over the two lower bars a thin rod is placed, this being for the purpose of distributing stress equally over the two bars. Similar vertical loops and transverse rods are placed at frequent intervals in the length of each beam.

The longitudinal reinforcement of the main beam includes eight bars of 41 millimetres diameter in the tension area, in two rows of four bars, between them being a short rod of 14-millimetre diameter to distribute the stress. Similar pieces are placed at intervals along the beam. There are four bars of 43

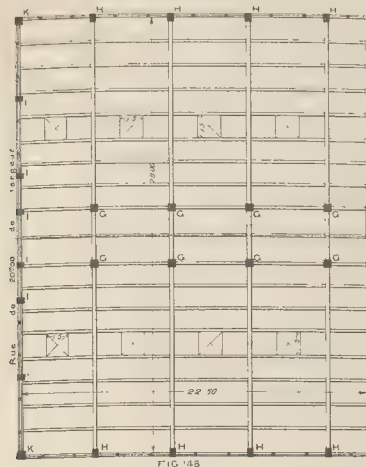


FIG. 148

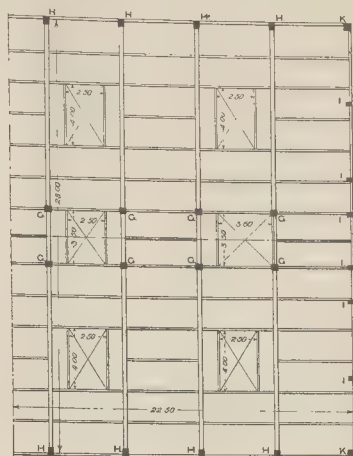


FIG. 149

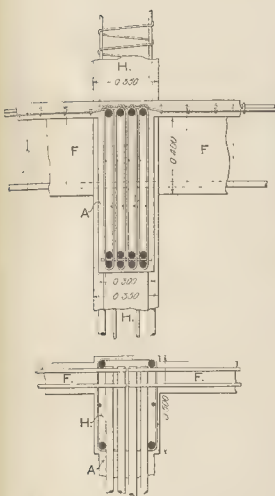


FIG. 150.

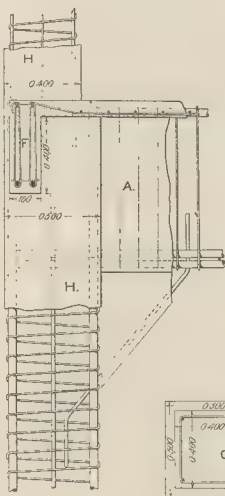


FIG. 151

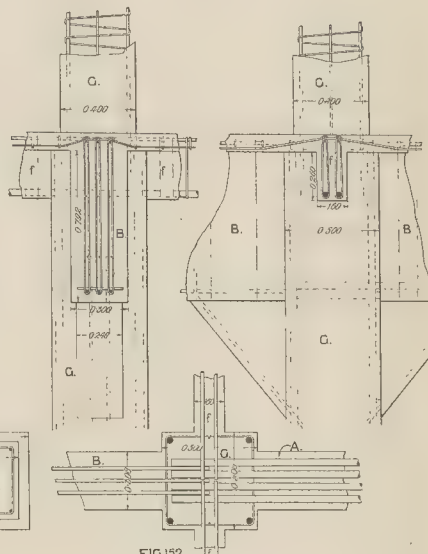


FIG. 152.

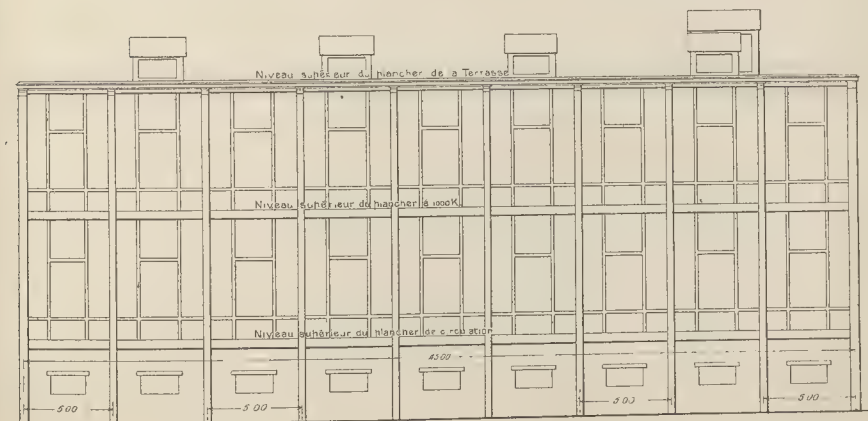


FIG. 153.

millimetres diameter in the compression area, and the two series are connected, as in the case of the smaller beams, by vertical ties of 6 millimetres diameter, similar ties, but of reduced diameter, being employed at intervals of about 8 centimetres apart, as indicated by broken lines in Fig. 151.

As shown in Fig. 147, the upper portion of each column is extended to form brackets with the object of affording more rigid support to the main beams. Fig. 151 illustrates the nature of the reinforcement applied to these projections. It simply consists of two bars of 16 millimetres diameter bent at each end so as to provide for secure anchorage into the concrete of the columns and floor beams, respectively, the brackets themselves measuring 60 centimetres high by 50 centimetres wide.

The reinforcement of the floor slabs between the main and secondary beams consists of 6-millimetre and 8-millimetre diameter rods disposed crosswise so as to form a network with meshes from 13 to 14 centimetres square. It will be seen by the drawings that all these rods are very securely connected with the reinforcement of the beams in order to bind the entire construction together.

Above the level of the second floor the dimensions of the H type column are reduced to 40 centimetres by 35 centimetres and the four corner verticals to 16 millimetres in place of 42 millimetres in the story below, and the two intermediate bars of 20 millimetres diameter are replaced by others of 10 millimetres diameter. The spiral hooping, however, still consists of 6-millimetre diameter wire.

Fig. 152 contains some drawings illustrating the details of type G columns and the floor system in connexion therewith. The general construction is very much like that already described, but as the span of the main beams is comparatively small, the proportion of steel is very much less than in the case of the beams proceeding from the type H columns.

Having no well load to carry, the corner vertical bars of the type G columns have the diameter of 36 millimetres in place of 42 millimetres and there are four 10-millimetre bars, one in the middle of each side. The spiral hooping, as before, is of 6 millimetres diameter.

These columns are reduced in area above the level of the second floor to 40 centimetres square, and the reinforcement is reduced to the dimensions of 16 millimetres diameter for the four corner bars, while the four intermediate bars are kept at the diameter of 10 millimetres. The cross-section at the left-hand corner of Fig. 152 is useful as indicating the comparative dimensions of the upper and lower sections of a type G column.

The cross-section at the right hand of the same figure shows the manner in which the horizontal reinforcement of two main beams is interlocked at the column. There are only three bars in the tension area of the main beam of the shorter span, these bars being of 18 millimetres diameter, and over them are distributing rods as in all the other beams, the diameter in this case being 10 millimetres. The three bars in the compression area of the main beam are of 14 millimetres diameter, and they are connected with the lower series by vertical ties of 4 millimetres diameter, these ties occurring at intervals of 10 centimetres along the beam. The upper portions of the columns are extended to form brackets for supporting the beams as previously described. This floor is calculated for a superload of 1,000 kilogrammes per square metre (205 lb. per sq. ft.).

The type I columns are reduced above the level of the second floor to 40 centimetres by 35 centimetres with a corresponding reduction of the reinforcement, but the type K columns are continued without alteration of transverse dimensions to the top of the building.

Fig. 149 is a half plan of the terrace roof showing the arrangement of the beams and the position of the lanterns.

The roof beams at the front and back of the building are 16 centimetres wide by 40 centimetres deep, and those along the ends are of the same dimensions. These beams receive intermediate support from 15-centimetre square stanchions in the walls as in the case of the first and second floors. The main beams running from front to back are 24 centimetres wide by 70 centimetres deep, and, like those on the floor below, receive additional support at the columns from bracketed projections from the last-mentioned members.

As the roof has only to bear its own weight

and the load due to the weight of employees having occasional business thereon, the terrace has been calculated for the small superload of 50 kilogrammes per square metre (10.25 lb. per sq. ft.). Consequently the dimensions of the beams are very much smaller than those on the second floor, the difference being much more marked in the secondary than in the main beams.

We have already given the measurements of the main beams, and the spans are uniform with those on the floors below. The secondary beams measure 10 centimetres wide by 25 centimetres deep, and are spaced 2.025 metres apart, with the exception of two 1.80-metre spans between the type G columns.

The reinforcement of the roof beams is considerably less in amount and in proportion to the concrete than in the other floors, but it is not necessary to multiply figures by quoting the precise dimensions and numbers of the different bars.

The roof slab is of reinforced concrete 6 centimetres thick, and has a fall of 1 centimetre per metre to provide for the flow of rain-water into the gutters. The slab is pierced by twelve openings for the lantern structures, these openings being bordered by trimmers of the same width and depth as the secondary beams and continued up with a thickness of 8 centimetres to form the walls of the lanterns. The eight lanterns at the front and back of the building have the uniform dimensions of 4.00 metres by 2.50 metres in plan, and of those in the centre row three measure 3.50 metres by 2.50 metres, and one, which covers the staircase enclosure, 3.50 metres by 3.60 metres.

Over the concrete of the roof slab is a layer of rock asphalt to avoid the slightest risk of percolation, and fine gravel is spread upon the asphalt to the depth of 1 centimetre.

Fig. 153 is an elevation of the principal facade of the storehouse described above. All the concrete-steel columns there shown project as pilasters, the concrete-steel main beams of the first and second floors and of the roof are also slightly in advance of the concrete-steel framing between the principal members. This framing, which, as already stated, consists of 15-centimetre square stanchions and horizontal beams, being flush with the panels or curtain walls of brick.

The elevation of the back and ends of the storehouse is of similar character, although the details of the arrangement necessarily vary somewhat at the ends. As usual in all concrete-steel construction of good design, the whole of the concrete members are monolithic, and all the reinforcement is properly connected. Thus the framework of the building is a complete structure in itself, very much akin to the steel cage familiar to American architects.

Although far smaller than the Manchester dock sheds described a week or two ago, the two storehouses at Gennevilliers are interesting examples of reinforced concrete design, and the fact that they were completely built in the short period of four months by unskilled labourers under the direction of two foremen is one more proof of the advantages offered by concrete-steel in the way of simplicity and rapidity of construction.

OBITUARY.

MR. WHELLOCK.—The death, on May 24, is announced of Mr. Robert Philipps Whellock, aged 70 years, of 45, Finsbury-pavement, E.C., and 17, Dunkeld-road, Chadwell Heath, Essex, and formerly of Catford. Mr. Whellock was elected an Associate of the Royal Institute of British Architects in 1879. Of his principal architectural works we may instance his designs for the billiard-room, Polapit Tamar, Launceston, the Public Free Library in Gordon-road, Nunhead, and the Public Free Library in Old Kent-road, South London, 1896. Four years ago Mr. Whellock published a treatise entitled "Pure Water for London," describing in detail his project for, in his own words, supplying water "from the vast subterranean storage of water which is known to exist below the London basin"; and in connexion with that scheme, he exhibited some drawings, wherein a water-tower formed a prominent feature in the Royal Academy rooms, 1900.

GENERAL BUILDING NEWS.

CHURCH, SWANSEA.—The foundation-stone of the new Church of St. Michael's was laid at Manselton, Swansea, recently. The church is situated in Major-street, on a site opposite the council school. The plan is of a town church type, consisting of a nave, 72 ft. long by 27 ft. 6 in. wide, north and south aisles, 72 ft. long by 25 ft. wide, the chancel, 32 ft. 6 in. by 25 ft., with an organ-chamber, and choir vestry on the south side, and clerical vestry on the north side. The church is lighted by traceried windows of varied patterns. The building, when completed, will accommodate 688 persons, and will cost £500. The chancel steps and pavement will be of black-and-white Sicilian marble. The walls are built of grey native stone, with box ground stone dressings, and the roofs are to be covered with green Tytham slates. Mr. E. Bruce Vaughan, of Cardiff, is the architect.

PARISH CHURCH, WOOLER.—It is proposed to restore the Parish Church of Wooley, Northumberland, and Mr. Charles R. Baker King, architect, of London, has made a report and submitted a rough plan for dealing with the whole structure. The tower will remain, but it requires pointing. It is also proposed to have two new entrances. It is also proposed to under the tower as a baptistry. The nave will be on the lines of the original church, with the addition of north and south aisles and chancel, with organ-chamber and vestry.

MISSION HALL, FENHAM, NEWCASTLE-ON-TYNE.

—A new mission hall is to be erected on a site at the corner of Wingrove-road and Hadrian-road. The new premises will be built of Glossburn stone and red pressed brick in the Gothic style. The dimensions of the hall are 62 ft. 6 in. long by 32 ft. wide, and seating accommodation will be provided for about 250 persons. The entrance porch to the main building will be in Wingrove-road, a south-west end, and inner wing will give access to the hall. The contract for the work has been let to Mr. Edward Weatherley, of Newcastle, and the designs have been prepared by Mr. Karl B. Spurgin, architect, of Newcastle.

PARISH CHURCH, BENDERLOCH, N.B.—The new parish church, which has been built at Ledaig for the Benderloch district of Argyllshire, was opened on the 17th ult. The building, which is in the Early Norman style, has been erected from designs by Mr. G. Wolfe Dresan, C.E., Oban.

CHURCH RENOVATION, LIVERPOOL.—St. David's (Welsh) Church, Brownlow-hill, has recently been undergoing restoration. The interior of the roof have been renewed, the slating has been made good, and new lead gables have been put in. Dry rot had got into the floors, which have also been repaired, and new heating apparatus has been put in, while the interior of the building has, in addition, been redecorated. The work has been carried out under the superintendence of Messrs. Watson & Thomas & Co., architects of Liverpool. Messrs. J. B. Johnston, slating; Messrs. Tomlinson & Sons, general contractors; and Mr. Edward Jones, decorations.

RESTORATION OF ST. NICHOLAS, CHESTER.—The repair and restoration of the church are now complete.

The work, which has been going on for more than a year, was comprised the thorough overhauling of the tower, the clearstory, the north aisle, and the parapet of the south aisle, besides minor repairs at the east and west ends. The church is said to go back into the 11th century, the original portion being the nave, on the north wall of which are, at the present time, two Saxon windows surmounting the Norman arches. The tower, at least the lower part, first added. The tower, at least very early, is probably late Saxon, or at least very early Norman. On the outside, as it rises above the level of the nave, there is some interesting herring-bone work, composed of large Roman tiles, which apparently belonged originally to the Jewry wall, a structure the materials of which have been largely worked up in times gone by into the fabric of the church. About a hundred years ago the tower was found to be so dilapidated as not to be able to sustain the weight of the spire then existing. It was decided on that account to remove the spire, and, as the parish was suffering from chronic poverty, money could not be found to restore the worn-out stonework of the tower. The result was that the beautiful Norman arcade, consisting of practically or arches, with their pilasters, was practically obliterated. The remains of the spire were removed, and the tower was faced with ordinary bricks from a neighbouring brickyard. These bricks, in the course of a hundred years, had mellowed down so much that they were a few persons in the town strongly objected to their removal. They certainly helped to give an artistic character to the structure. But when, about three years ago, it was found that

stone-work that had been left was in a friable state, and that the masonry behind the brickwork was more or less fairly good, it was decided by the Church Council of St. Nicholas to once more bring the tower to the former and appearance which had when built many centuries ago. It was found, though, that much new stone would have to be introduced, there would be an uncovered display on each face of the tower of about 160 sq. ft. of ancient panelling and repair only to a limited extent. The restoration has been carried out. The clerestory windows retain architecturally their original character, though, owing to extreme dilapidation, they are now practically new. The windows of the north aisle appear to have been built some thirty years ago of unsuitable stone, which had weathered so much that it was found necessary to remove half the windows and insert new stone. The total cost of the repair and restoration is close on 1,500*l*.

ROOKHOF, DURHAM.—The new church, dedicated to St. John the Evangelist, has just been consecrated at Rookhofs. The edifice replaces a former church, erected in 1866, which stood on low-lying ground near the sea. The church has been erected on the site of the old one. The design is by Messrs. Carré & Passmore, architects, and Mr. Wm. Hall, of Gateshead, was the contractor. The cost of the building was about 1,200*l*., and that of furnishing 250*l*.

RESTORATION OF FINGHALL CHURCH, YORK.—This church has just been reopened after restoration. The architect for the work was Mr. Brierley, of York. There is one aisle on the north side, and this is divided from the nave by three circular arches sustained by circular piers. This is the Norman part that dates back to the thirteenth century. A new roof has been placed upon the building, and all the common deal, old rafters, and roof-pews have been cleared out, and replaced with modern seating. The old nave was all covered with plaster and whitewash, and this has been removed from all the walls and faced stones. The removal of the whitewash from these arches has laid bare a representation in red paint of six angels.

All the plastered parts of the building have been replastered. The old wood has been taken up and relaid at a level 1 ft. lower than the old, filled in with concrete and cement, and covered with boards, except the central path, which is covered with flag. The chancel floor has been raised above the level of the body of the church. A new stone doorway, the chancel has been made in the north side, and also a new stone doorway from the chancel into the vestry on the north side. To the vestry has been added a building for the heating apparatus of hot-water radiators distributed around the church in the old stone walls. All the windows have been replaced with old stained glass in a new window of the chancel has been newly protected and refixed. The old stained glass gallery at the west end of the church sustained with the entrance to it in the porch. The wood dado around the walls is renewed. The walls have been repointed and painted. Externally the earth has been removed from the foundations, and a deep channel made around to carry off water. The masonry and the woodwork has been carried out by Mr. W. Anelay, master, and the new heating apparatus is by Messrs. Norman, of Sheffield.

ROMAN CATHOLIC CHURCH, DUBLIN.—The new altar and spiral attached to the Sacred Heart Church, Templemore, has just been completed. The work is from the design of Messrs. Ashlin & Coleman, architects, Dublin, the contractor was Mr. T. Mackey, also of Dublin.

BATH ABBEY RESTORATION.—A meeting of the Bath Abbey Restoration Committee was held on the 29th ult., the Bishop of Bath and Wells presiding. Mr. T. Jackson, the architect, addressing the meeting, explained the unsafe condition of the four pinnacles on the tower of the two at the east end, which was discussed as the result of one being struck by lightning last August, and said the alternative were:—(1) To have no pinnacles; (2) to retain the existing ones, retaining the stone on the tower; (3) To erect pierced pinnacles of other design and of less height at a cost of 2,000*l*. He submitted a plan of the new pinnacles as proposed, and Mr. E. T. D. Foxwell moved, and the rector of Bath seconded, a resolution authorising the removal of the

existing pinnacles and the substitution of those proposed by Mr. Jackson.—The Rev. H. H. Winwood moved an amendment providing only for the removal of the old pinnacles, believing that the tower should first be seen without pinnacles; but he only found two supporters, and the resolution was carried.

WESLEYAN CHURCH AND MANSE AT LLANDRINDOD.—New Wesleyan church and manse are now in course of erection at Llandrindod Wells. The plans have been prepared by Messrs. Ewen Harper Brothers, Birmingham, and they provide for church, schools, and manse. The church itself will cost about 5,000*l*., the manse 1,400*l*., and the schools (which are not being built at present) 2,600*l*., and the tower and spire of the church another 3,000*l*., so that the total cost of the buildings will be about 13,000*l*. The contract for the present block of buildings has been let to Messrs. Dallow & Son, Blackheath, Birmingham. The building is faced outside entirely with Yorkshire stone. The tower, with its spire, will rise to a height of about 200 ft. The church has a nave, aisles, and chancel, with organ-chamber. A ladies' parlour, which will seat seventy, and a ministers' vestry are also provided. The seating accommodation of the church is for 500, but the plan is so arranged that the accommodation can be increased to 800 in the future.

EVANGELICAL CALVINIST CHURCH, FERNDALE, WALES.—The opening service of the English Calvinistic Methodist Church at Ferndale took place recently. The church is built in the Gothic style, and has seating accommodation for 700 persons. There is a vestry attached capable of seating 120, together with a book-room and ministers' room. The total cost will be 2,800*l*. The architects were Messrs. Lewis & Morgan, Pontypridd, and the builder Mr. Howell Lewis, Ferndale.

PRESBYTERIAN CHURCH, FOREST HALL, NEWCASTLE-ON-TYNE.—The opening of the new Presbyterian church, which has been erected at Forest Hall, took place a short time ago. The work was carried out by Mr. Craven, builder, of Newcastle, from designs by Mr. Walton Taylor, architect.

WESLEYAN CHURCH, CASTLE DONINGTON.—On the 24th ult. the foundation-stones of the new Wesleyan chapel, at Castle Donington, were laid. The plans for the work have been prepared by Mr. A. C. Lambert, architect, of Nottingham.

NEW GRAMMAR SCHOOL, LINCOLN.—The Board of Education has passed the plans for a new grammar school at Lincoln. The site selected is one of 12 acres in extent on Wragby-road. The school buildings will face south, and football and cricket grounds will be provided in their rear. The school premises are to be two-storied, and the ground floor will have a series of thirteen arches in stone. Behind will be changing-rooms for day boys and boarders, while at right angles, to the east, will be the refectory and kitchen, and above the dormitories. On the first floor of the central building, over the cloisters and changing-room, will be the library, flanked on either side by classrooms. The science block stands beyond the refectory, in the eastern wing, together with the manual instruction-room, while to the north of the central block it is in contemplation to make a future addition of an assembly hall for 300 persons. The dining-hall at the school will seat 120, and will be 61 ft. long by 22 ft. 6 in. wide. Mr. Leonard Stokes, of Westminster, is the architect.—*Standard*.

PRIMITIVE METHODIST CHURCH, BRAMPTON.—A new is shortly to be commenced on a new Methodist church at Brampton. The proposed building will provide sitting accommodation for upwards of 600 worshippers. The exterior walls will be of red-pressed brick, with stone dressings. The work has been designed by Mr. W. Cecil Jackson, of Chesterfield, whose plans were selected in competition.

CHURCH ROOM, BRIGHTON.—Sir Henry Aubrey-Fletcher, C.B., M.P., visited Brighton on the 15th ult. to open St. Martin's Church Room. The new church room has a 30-ft. frontage facing Lewes-road, and provides accommodation for 300 persons. A small gallery has been erected; there are two lobbies, and behind the platform is a classroom, from which communication may be had with the church. The room is lighted by electricity. The architect is Mr. C. E. Clayton (Messrs. Clayton & Black).

PROPOSED WESLEYAN METHODISTS' HALL, SHEFFIELD.—A new central hall is to be erected in George-street, Sheffield. The estimated expenditure upon the new buildings, including furnishing, organ, etc., is 40,000*l*. Messrs. Waddington, Son, & Dunkerley, of Manchester and London, are the architects.

MISSION HALL, DUNDEE.—Contracts have been accepted for the erection of a mission hall in Taylor's-lane, Dundee. The building will contain, on the ground floor, a hall, with cloak-

room and lavatory accommodation, and upstairs, two smaller halls and private room. It is to be built of red terra-cotta brick, with base course and facings of red Dumfriesshire stone. The architect is Mr. Charles G. Soutar, of Dundee, and the following are the contractors for the work:—Mason, Mr. John B. Hay; joiners, Messrs. Garvie & Farquharson; plumber, Mr. T. M. Dewar; slaters, Messrs. James Laburn & Son; plasterer, Mr. James Laburn; glaziers, Messrs. Donald & Smith; and painter, Mr. David Stewart, all of Dundee.

RESTAURANT, NEWCASTLE.—A new restaurant has been erected in Grey-street, Newcastle, and will shortly be opened. Messrs. J. & W. Lowry have built the main structure, and the architects are Messrs. W. H. Knowles, of Newcastle, and W. & T. R. Milburn, of Sunderland.

PUBLIC LIBRARY, COATBRIDGE, N.B.—On the 18th ult. the new free public library and reading-rooms, erected in Academy-street, Coatbridge, were opened. The buildings are two stories in height, with a basement floor in addition, and the outer walls are of red sandstone from Corsehill Quarry. The main entrance leads into a hall, around which are grouped the lending library for 20,000 volumes, general reading-room for 120 readers, ladies' room for thirty, boys' for thirty, and girls' room for twenty, also a committee-room. The reference library is placed on the upper floor, there being space for twelve readers and accommodation for 7,500 volumes. There are also librarians' room, rooms for the staff, lecture hall, and a dwelling-house for the librarian. The design of the buildings is Renaissance, and the estimated cost is 9,874*l*. Mr. Alexander Cullen, of Hamilton, was the architect for the work, his designs being selected in competition.

HOSPITAL, MEXBRO.—The new Montagu Hospital was opened at Mexbro on the 18th ult. The new institution occupies a site of about 3 acres at the junction of the Adwick and Cemetery roads. The buildings comprise an administrative block, with the necessary domestic offices, operating theatre, male and female wards, isolation block, laundry, and mortuary. The administrative block faces the Cemetery-road, extending east to west, with a southern aspect. It is a two-storied building, designed in Queen Anne style, and, like the whole of the structure, is built of best Conisbro' red bricks, with dressings of Mexbro' stone. The porch and hall walls are lined with Rockingham glazed bricks, and the flooring of the former is mosaic, and the latter of wood in herring-bone design. On the left of the entrance is the secretary's office, adjoining which is the medical staff's private room. There is also a board-room, 30 ft. by 18 ft. To the right are the nurses' quarters, matron's sitting-room, nurses' dining-room, 20 ft. by 15 ft., and their sitting-room. Above is a sickroom for the nurses, six bedrooms, bath-rooms, etc. From the hall of the administrative block a corridor paved with granolithic and with walls of cement communicates with the other departments. Halfway down are domestic quarters, kitchens, pantries, and underneath the chamber which heats the buildings. At the entrance end is the operating pavilion, and on one side is the surgeon's room. The theatre is 17 ft. square, and lighted from above as well as at the sides. On the west side is the female block connected by a corridor. It is 35 ft. by 24 ft., and made to accommodate eight beds, and adjoining is a small ward for children. The floors are raised by arches from the ground, which are of marble terrazzo. The rooms are heated by a central stove passing up to the roof, and faced with glazed tiles. The male ward is 45 ft. by 25 ft., and will hold in its two compartments ten beds and eight beds. The isolation ward, which stands behind the female ward, is approached from the rest of the building by a verandah. The institution is electrically lit throughout. The architect is Mr. J. E. Knight, of Rotherham; and the contractors Messrs. W. Thornton & Son, Rotherham. The sub-contractors are:—Plumbing and electric installation, Messrs. Snowden, of Barnsley; plastering, Messrs. Bendelow & Bennett, of Mexbro; joiner's work, Mr. T. Outram, of Rotherham; heating engineers, Messrs. Wright Brothers, of Attercliffe; terrazzo floors, Messrs. Geary, Walker & Co., of London; granolithic paving, Messrs. Hodkin & Jones, of Sheffield; laundry and fittings, Mr. Summerscales, of Keighley.

TOWN HALL, SUTTON COLDFIELD.—On the 24th ult. the foundation-stone of the new town hall at Sutton Coldfield was laid by the Mayor and Mayoress. The new town hall, with fire station attached, is being erected on land adjoining the council house, where formerly stood some stabling and coach-houses used by the fire brigade for their fire station. The town hall will comprise an assembly-room, 78 ft. by 42 ft. 9 in. and 30 ft. high, which will give

accommodation for some 650 people; a supper-room, 41 ft. by 23 ft., to accommodate between seventy and eighty persons; cloakrooms, and other offices. The main entrance to the hall will be from King Edward's-square, through a crush hall, and there will be two emergency entrances from the council house side, beside three other doors. The whole of this accommodation, with the exception of the platform resting-room, has been provided on the ground floor, thus dispensing with staircases. The fire brigade buildings include a fire-engine room, 36 ft. by 30 ft., giving accommodation for three engines, with recreation-room and stabling. Between these buildings there will be a tower 60 ft. high. The red sand bricks used in the construction of the building were made in Sutton, and the facings are of Bath stone. The buildings are from plans prepared by Mr. Arthur R. Mayston, of London, and are being executed by Mr. T. Elvins, of Birmingham, at an estimated cost of 10,100.

NEW BATHS, HULL.—The new baths in Beverley-road, Hull, have been built to provide accommodation for the northern and north-western portions of the city, and to replace the old Trippett baths which were small and obsolete, and have now been closed and utilised as the Corporation Telephone Exchange. The site is situated at the corner of Beverley-road and Epworth-street; the frontage to Beverley-road is 120 ft., and that to Epworth-street 255 ft. The accommodation is as follows:—Men's swimming-bath, 100 ft. by 35 ft.; depth of water, 3 ft. 9 in. to 6 ft. Boys' swimming-bath, 60 ft. by 40 ft.; depth, 2 ft. 6 in. to 4 ft. Ladies' swimming-bath, 65 ft. by 34 ft.; depth, 3 ft. 3 in. to 5 ft.; also forty-eight slipper-baths. The exterior of the building is in English Renaissance style, and is of red Leicestershire sandstone, with dressings of Ancaster stone; the coverings of the cupolas and Mansard roof is of copper. On entering the building the bather passes through a small vestibule in front of the ticket office. To the right of the ticket office is the entrance to the large swimming-bath and to the left is the entrance to a waiting-hall, giving access to the slipper-baths. In line with the front entrance is a long corridor running through the centre of the building, and giving access to the boys' bath and the boiler-house, laundry, etc. The slipper-baths are contained in three corridors branching off the waiting-hall. The ladies' bath is situated beyond the slipper-baths, and is reached by a separate entrance from Epworth-street, while six of the slipper-baths are shut off from the general block during the swimming season, and reserved for ladies only. Beyond the ladies' bath are the boiler-house, cycle store, and laundry. In the large swimming-bath is a gallery, constructed of steel girders and concrete, and fitted with flip-up seats with a back row considerably raised so as to give a good view of the water area as possible. In case it is decided to cover in the bath during the winter months this gallery will add very much to its utility as a concert or lecture hall, and, to further extend its utility, the dressing berths have been made collapsible, and emergency exits have been provided opening direct on to the Beverley-road. The ladies' bath has a pitch-pine roof; the dressing berths have fixed partitions of pitch-pine, and the lower part of the walls, where not concealed by dressing berths, is tiled. The slipper-baths are enamelled porcelain, and are all provided with hot and cold showers, so arranged that the bather cannot scald himself by turning on the hot water first. The water supplied to these baths will be softened. At the end of the waiting-hall is a refreshment buffet, at which coffee and other light refreshments will be supplied to early morning bathers and others. The floors throughout the public part of the building, except in the long corridor to the boys' bath, are of mosaic, mostly of the type of marble mosaic which has now become familiar, but, as complaints have arisen that this pavement becomes slippery to bare feet, the gangways around the men's and ladies' swimming-baths have been paved with Rust's vitreous mosaic, and those around the boys' bath with a special form of marble mosaic introduced by the contractors for the first time at these baths. The lower part of the walls, where not exposed to rough treatment, is tiled, and elsewhere faced with enamelled bricks, and the upper part is faced with premier buff bricks, relieved in places with coloured bricks. The building is lighted throughout by electric light. Nerve lamps being used in the larger rooms. Pilot gas lights are provided for emergencies, and the ventilation of the large swimming-bath is assisted by sun burners placed under the ventilators. The ventilation is obtained by means of Boyle's air-pump ventilators at the roofs, and suitable low-level inlets. Those parts of the baths which will be used in winter are heated by radiators, and a single section radiator is placed in each slipper-bath.

The heating, both of the building and the water, is provided by three boilers, 26 ft. by 6 ft., which may be used either as steam boilers or as water heaters. The method of heating water for the slipper-baths practised in Hull differs considerably from the usual practice. In its simplest form the town water is supplied to a tank on the roof and passes from this tank through the boilers direct to the baths. The results of this system have been very satisfactory, and the fuel consumption is not much more than half that under much more expensive and more modern systems. The only variation introduced into the new baths, therefore, has been to sink the boilers below the level of the baths, so that the hot-water supply pipes may be arranged to allow a circulation. For the heating of the swimming-baths the manager will have two methods at his disposal, and in beginning to fill the baths he will pass in hot water from one or two of the boilers until the water has reached a certain level, when he will cut off the hot water, and turn on steam from another boiler. This steam will pass through an injector which will draw the water from the deep end of the bath, and return it to the shallow end, and after the bath is filled the temperature will be kept up, and the water kept in circulation by this method. An efficient steam laundry is provided, and the towels, etc., will be dried in a room over the boilers, utilising heat which would otherwise be wasted. Practically the entire space under the floors is formed as subways, so that all the pipes and valves are easily accessible. The building and engineering work have been entirely designed and carried out under the City Engineer, Mr. A. E. White, the assistant in charge of the work being Mr. T. Thomas, chief engineering assistant. The contractors are as follows (all of Hull, except where otherwise stated).—Foundations and bath tanks, B. Good & Sons; super-structure, Messrs. Quibell, Son, & Greenwood; sub-contractors (under Messrs. Quibell, Son, & Greenwood), plasterer, Mr. W. Russell; joiner, Mr. W. Sanderson; plumber and glazier, Mr. J. Beal; slaters, Messrs. Dawber, Townsley, & Co.; painters, Messrs. C. B. Drury & Son; roof, principals, etc., Messrs. G. B. Smith & Co. (Glasgow); boilers, The Low Moor Company (Bradford); pipes, fittings, etc., Mr. W. L. Harrison; mosaic paving, Messrs. Hodkin & Jones (Sheffield); tile and faience work, Mr. Alfred Whitehead (Leeds); hardwood joinery, Messrs. H. Arnold & Son (Doncaster); front railings, Messrs. John Jones & Sons (Manchester); electric lighting, Messrs. A. Reame & Co.; laundry machinery, Messrs. W. Summerscales & Sons (Keighley); water softener and ferro-concrete storage tanks, Messrs. Rose, Downs, & Thompson. The clerk of the works was Mr. A. Jaram. Some of the contracts are not yet measured up, but the cost of the buildings and fittings may be taken as, approximately, 25,000, which is 2,000 below the amount of the estimate, and works out at 7½d. per cubic ft.

CONVALESCENT HOME, BEXHILL.—On Saturday last week, several members of the Board of Management of the Metropolitan Convalescent Institution paid a visit of inspection to the new home for men at Little Common, Bexhill-on-Sea. The home, which stands on rising ground overlooking the sea, is about three miles from Bexhill. Though planned for the accommodation of 118 patients when complete, the funds in hand did not permit of the whole building being completed at once, but the central portion now thrown open for use provides accommodation for the full staff and seventy-one beds for patients. As planned the remainder, consisting of the east and west wings, can be added without interfering with the working of the present portion. The complete scheme provides for patients on the main front, a reading and quiet room, a large general sitting-room, and a smoking-room. The building is as far as practicable designed to be fire-resisting, and is lighted throughout by electricity. The total cost of the building, exclusive of the site, is about 18,650. The building contractors were Messrs. Holloway Brothers, Lambeth, and Messrs. Rowland Plumb & F. M. Harvey were the architects.

WESLEYAN CHURCH, BUSHEY.—The new Wesleyan church, erected on Chalk Hill, Bushey, was opened recently by Sir John H. Puleston. The church, including land, has been built at the total cost of 6,672. 15s. The edifice, which is late Gothic, freely treated, is built of red brick and Bath stone dressings; the entire woodwork is of pitch-pine, the internal structures being supported by cast-iron columns. A gallery runs round the building, and space is left on the west side, that is, at the back of the pulpit, for an organ. The windows are leaded, with cathedral glass. Electric light is furnished throughout, and the heating is by hot-water pipes. The church building is seat 750. The builder was Mr. Charles Brightman,

of Watford; the electrician, Mr. Harold Downer, Watford; the glazier, Mr. H. Tim Watford; while the heating arrangements were carried out by Messrs. C. P. Kinnell & Co. Messrs. Charles Bell, Withers, & Merdith, London, were the architects.

PROPOSED HIPPODROME, KINGSTON.—Plans for a new hippodrome have been approved by the Building Plans Committee of the Kingston Town Council. The site of the proposed structure will be at the junction of the Richmond and London roads. Mr. W. Oldham Chambers, architect, of Kingston, prepared the plans.

HOSPITAL EXTENSION, BUCKNALL.—To provide additional accommodation at the infectious diseases hospital at Bucknall, extensions have been carried out at a cost of some 2,000. The extensions, which have just been opened, include a new pavilion, with separation wards and annexes, an addition to the administration block, the erection of cottages for the engineer and cookmen, provision of a new power block, including new steam boiler, additional accumulators, etc. Mr. E. Jones, architect, prepared the plans for the work.

HOTEL, CARLISLE.—The new Crown and Mitre Hotel, which is in course of erection in Castle-street, is approaching completion. The building provides accommodation for between fifty and sixty beds, and the estimated cost is about 50,000. Messrs. Oliver & Doghson, of Carlisle and Leeds, are the architects, and Mr. Thain is the clerk of works. The builders are Messrs. Beatty Brothers; joiner, Mr. George Black; plasterer, Mr. Ormerod; plumber, Mr. Forster; alater, Mr. Kallett; and painter and glazier, Mr. Kirk. The heating apparatus is being fitted in by Messrs. Macdonald & Moncrieff, Edinburgh; Mr. Steinthal, Bradford and New castle, is responsible for the electric light installation.

CONVALESCENT HOME, HARBOROUGH.—The foundation-stone of a new convalescent home, which is being erected for the authorities of the Durham County Hospital, at Harborough, was laid on the 20th ult. The design for the work has been prepared by Mr. W. T. Jones, architect, and the cost will be 7,000.

TOWN HALL, KIRKINTON.—On the 24th ult. the memorial-stone of the new town hall in Union-street was laid. The hall is to accommodate 1,200 people, and is estimated to cost about 8,000. The hall is from plans by Messrs. Walker & Ramsay, architects, Glasgow.

PRIMITIVE METHODIST CHURCH, LEEDS.—The foundation-stones of the new Primitive Methodist Chapel and Schools in High-street, St. Peter-at-Gowts, Leeds, were laid, on the 24th ult. The chapel and school are being erected by the worshippers of the Primitive Methodist Railway, Portland-place, the Great Northern Railway Company having purchased the site for extension purposes. Messrs. Halker Brothers, undertakers, of Leeds, are the architects. The cost of the building is being provided in the chapel for 500, and in the school for 1,000. The chapel will be a lecture-hall and other rooms.

NORTH BRITISH STATION HOTEL, GLASGOW.—The North British Station Hotel, Glasgow, has just been opened. The hotel, which is from George-square, one leading to the lounge and the other to the restaurant, but there is also an entrance from Queen-street, a few yards distant from the arrival platform, and another at the eastern end of the building, in Hanover-street, leading to the cloakroom. Off the hall at the Queen-street entrance is the gentlemen's writing room, and at the other end for the use of lady visitors is a lounge. To the right of the lounge are the public restaurant and dining-room, and the kitchen, which are reached the smoke-room, and the smoking room to the eastern end of the building. Behind the staircase leads from the kitchen. A wide staircase leads from the lounge to the upper floors, and alongside is an elevator. On the first floor the bottom room is twenty-four in number, are arranged in rows. There are also two large sitting-rooms on this floor. The second, third, and fourth floors are wholly devoted to bedrooms. The plan of the hotel is in all respects complete, and the heating is by radiators, and a complete installation of electric fans is provided, and the building is lighted by the electric light. The revolving doors are fitted with the Kannel revolving doors are fitted with the principal entrances. The architect is Mr. Baird & Thomson, Glasgow, and the work has been carried through by Mr. John Crabbie, clerk of works, and Mr. John Crabbie, clerk of works, under the supervision of Mr. John Crabbie, clerk of works.

BRANCH LIBRARY, IPSWICH.—The new branch library at California, Ipswich, was opened on the 24th ult. The building has been erected from designs by Mr. Frank Burrows.

STAINED GLASS AND DECORATION.

WINDSOR, YORKS.—The two centre lights of a transome window of this church have been added by Messrs. Percy Bacon & Co., who have already executed another window to this same window. The subjects of the present lights are the "Assommoir" in the bottom one, "The Virgin Mary" with "S. Mary" and "S. John" in the top one. The artist is Mr. J. C. Anstruther, N.B.—Two of the transome lights of a transome window in this church have been filled with stained glass, the subjects being "S. Philip" in the top light and "S. Peter" in the lower one. The artists for this work were Messrs. Percy Bacon & Co. The remaining four lights were filled with Cathedral glass, until such time as can be found to put in stained glass.

NAVY AND ENGINEERING NEWS.

THE WINDSORS AND RUNCORN TRANSPORTER.—On Monday last the new transporter crossing the Mersey and the Manchester Canal between Widnes and Runcorn, was launched by Sir John Brunner, in the presence of a large company representing various public utilities and commercial interests, to whom it is a means of communication is of direct importance. As this work was fully described in issue of October 31, 1903, we need only briefly to state the main features of its design. The structure is really a suspension bridge, in which the stiffening girders are at the height of 16 ft. above high-water level, this being the roadway between the water and the bridge. The girders from which it is hung are travelling from side to side of the river. The car contains accommodation for passengers and four two-horse vehicles, and is propelled by electric trolleys running on rails laid upon the lower flange of the stiffening girders. Ample provision is made for discharging passengers and rain during the passage, which occupies less than five minutes from beginning to end. After crossing the bridge on Monday last, Sir John Brunner and the chief guests were transported across the river in the car, which was able to move quite smoothly and without any perceptible oscillation. The structure has a span of more than any other bridge in the Kingdom, and was built from the designs of, and under the superintendence of, John J. Webster, M.Inst.C.E., of West-End, and Mr. John T. Wood, M.Inst.C.E., of Liverpool. As mentioned in our previous issue, the bridge, together with the approach viaducts and the well-lighted viaducts, are, in addition, fog-bells and other appliances provided for the guidance of ships passing up and down the river.

FOREIGN.

PARIS.—The French Government has intimated, at Rouen, under the direction of the Ecole des Beaux-Arts, a school of architecture, open to foreigners as well as to Frenchmen. Foreigners (of both sexes) who wish to enter this school must be provided with a certificate of introduction from the ambassador, minister, or consul general of their country, and the date and place of birth of the candidate for admission. Candidates must also produce certificates showing that they are prepared to undergo the necessary examination for admission. The age limit is from fifteen to thirty, both years inclusive. The studies are exactly the same as the course at the Paris School of Architecture, and the diploma is that of architecture given by the French Government.—The Ecole des Beaux-Arts have elected M. Allar successor to M. Guillaume. M. Allar was intended for a printer, but subsequently turned to the study of sculpture in the atelier of the sculptor Dantan. He obtained the Grand Prix de Rome in 1869, and the Médaille d'Or of the Salon in 1882. He is at present Professor of Modelling at the Ecole des Beaux-Arts.—An exhibition organised by the Société des Fouilles Archéologiques is to be opened at the Petit Palais, Paris; it consists of objects recently discovered in the Champs-Élysées and the Clittemon, and the exhibition is shortly to be opened an exhibition of pictures of the English school of the XVIIIth century, including works by Hogarth, Hoppner, Reynolds, Gainsborough, Turner.—Mme. Corroyer, the widow of a prominent architect who died last year, has bequeathed to the Louvre the whole of her late husband's fine ecclesiastical and household furniture of the mediæval periods.—Special measures have been taken to protect the Verbeke Museum from the risk of fire.—The Government have decided on the restoration of the church of Cuis, near Épernay, which has been classed as a "Monument Historique." The Jury in the competition

for a new Savings Bank at Vervins have selected the design by M. George Langlet, architect, of Barzy-sur-Marne.—The death is announced of a talented landscape-painter, M. Balaouze, whose works took an honourable place in the Old Salon.—A new hospital is to be built at Porthgann at an estimated cost of 1,867,000 francs. It is to be the subject of an architectural competition.

GERMANY.—In the competition for plans for the new buildings to be erected in Lübeck, the first premium of 1,600 marks was awarded to Herr Bunck, and two equal premiums of 800 marks to Herr Glogner and Herr Eggeling.—The ancient "Reichsanstalt," at Ratisbon, is to be completely restored; a committee has been formed to direct the work of restoration, of which Professor Gabriel v. Seidl is chairman.—In the competition for plans for workmen's houses to be erected in Darnstadt, more than 5,000 plans were presented; the first premium (1,000 marks) was awarded to Herr Arthur Vinkoop, and the second (600 marks) to Herr Josef Rings.—The ancient castle of Lichtenstein is to be restored from plans by Herr Alois Getreiner.—The principal tower of the cathedral at Metz is to receive additions from plans by Herr Torow.—The church of St. Michael, at Hildesheim, is to be restored at a cost of 70,000 marks.—The firm of MM. Lechmann & Zeuber have undertaken the building of the opera house to be erected in the Friedrichstrasse, Berlin.—The town hall at Dresden is to be restored by MM. Bräter & Roth at a cost of 19,800,000 francs.

SWITZERLAND.—A statue of Science, in white marble, has been executed by Herr Lutz to fill the niche in the central facade of the University at Berne.—The Swiss Nature Research Society (Naturforschende Gesellschaft) will hold its annual meeting at Lucerne from September 10 to 13.

AUSTRIA.—The church of St. Charles at Vienna is to be restored under the direction of Professor Zumbusch, Herr Fellner, and Herr Wächter.—A new church is to be built at Leipsa, in Bohemia, from plans by Herr Gürlich.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. Leaning & Tanner, quantity surveyors, have removed their offices from 28, John-street, Bedford-row, to 7, Southampton-street, Bloomsbury-square.—Messrs. Hickie, Borman, & Widdie, 4, Lloyd's Avenue, E.C.4, have been appointed sole agents in this country for "Anduro," a new roof-covering material manufactured in Austria.—The business of Messrs. Killer Brothers, Ltd., and that of the Hopton Wood Stone Company, Ltd., have been amalgamated, and will in future be carried on as "The Hopton Wood Stone Firms, Ltd."

LEEDS UNHEALTHY AREA.—A Local Government Board inquiry was held by Mr. E. A. Sandford Fawcett, M.Inst.C.E., at the Leeds Town Hall, on the 24th ult., into an application to borrow 15,724l. for the laying-out of streets in connection with the Leeds Corporation Improvement Scheme for the housing of the working classes in the Quarry Hill unhealthy area, and also 424l. for the purposes of street improvement at the junction of Branch-road and Stanningley-road. It was explained that the street for which borrowing powers were asked in regard to the Quarry Hill area was to be constructed from Regent-street to Burnanots-street with two contributory streets, the main street at a width of 75 ft. It was also proposed to construct a subway. Mr. Martin, the engineer for the unhealthy areas department, said they had pulled down forty dwellings, housing 113 people, and there were over 300 houses empty in the area. During the last fifteen months the number of empty houses in Leeds had increased 70 per cent., and houses were being built faster than the population was growing. It was proposed to demolish 279 houses, displacing 928 persons. The evidence in regard to the Stanningley-road street improvement having been taken, the inquiry terminated.

REHOUSING, LIVERPOOL.—Mr. F. H. Tulloch, M.Inst.C.E., Local Government Board Inspector, attended at the Municipal Offices, Dale-street, Liverpool, on the 24th ult., to examine the Liverpool Corporation's schemes for the erection of new artisans' dwellings in street and Clifford-street. Mr. Cripps, assistant Corporation solicitor, explained that the schemes submitted were for fulfilling the obligations of the Corporation under the several housing clauses and provisional orders. The Corporation's policy had been not to pull down any dwellings before erecting others for the displaced tenants. Some houses were demolished in Christian-street without a

scheme for rehousing being submitted to the Local Government Board. As this was an oversight, and although thereby the Corporation were liable to a considerable penalty, he asked the Board to exculpate them, because a street improvement has been effected, and there were plenty of vacant houses even at the present time in the half-mile radius. Out of 1,720 dwellings built by the Corporation 180 were vacant. A return prepared at the beginning of this year by the Head Constable showed 4,293 vacant houses in the city, of which 1,145 were houses of 5s. a week rent and under. This was to be explained by the fact that the electric tram system and cheap fares attracted the labouring class to reside in the suburbs. During the last four years over 2,000 of working-class houses had been built, chiefly on the outskirts.—Mr. Shalmerdine, Corporation Surveyor, explained the character of the dwellings proposed to be built in the streets previously mentioned.

LAMB'S HOME, DALSTON.—It is stated that the house, No. 14, Kingsland-row, Dalston, in course of being pulled down. Charles Lamb had lodgings there in or shortly after 1817, though at that time he and his sister had taken rooms, in the autumn of 1817, in the house at the corner, west, of Bow-street and Russell-street, Covent-garden, which stands on the site of Will's coffee-house.

NO. 32, CANNON-STREET, E.C.—The freehold of No. 32, Cannon-street is scheduled by the London County Council for purposes of a fire brigade station. The compulsory sale has formed the subject of a case—Bainbridge's Trustees v. the London County Council—in which an award of 15,850l. has just been made by Mr. Howard Martin, member of the Council, Surveyors' Institution. The claimants urged that they were entitled to an amount exceeding the value of No. 32, inasmuch as the premises could have been most advantageously used in conjunction with the adjoining house, No. 34, and in view of the detriment to be occasioned by the erection of the station. Sir Edward Boyle, K.C., appeared for the London County Council.

MEMORIAL SCREEN, BRISTOL CATHEDRAL.—On June 21 will be dedicated the Wait memorial chancel screen, comprising figures of fourteen saints of the English Church, of sixteen passages associated with the history of the cathedral, and over the arches, of the Good Shepherd, the Virgin, and SS. Stephen, Peter, and Paul. The screen is executed in Bathstone by Messrs. Cowlin & Son, of Bristol, after designs by Mr. F. L. Pearson, architect to the Dean and Chapter.

DISCOVERIES OF ROMAN REMAINS AT CHISWICK.—A discovery was made, on the 26th ult., at Chiswick, where, on the site of Old Chiswick House, which dates back to about 1500, some Roman remains have been brought to light. Whilst excavations were being carried on in connexion with the building of some flats on the estate, which was once the residence of Oliver Cromwell's daughter, the workmen came upon a filled-up vault, which experts have pronounced to be of Roman origin. The chamber measures 12 ft. by 10 ft. 6 in., and is composed of squared rubble chalk set in Roman mortar, whilst the floor is paved with 2-in. Roman red brick, and is 7 ft. below the present ground surface. It is surmised that, when Sutton Court, or Chiswick House, was built, the vault was filled in to help the foundations, as amongst the rubbish was discovered a fine specimen of early Fulham pottery, together with fragments of English and German pottery of the XVth century, besides other interesting archaeological relics. These include a portion of a carved stone shaft and a subterranean passage which is believed to have been connected with the River Thames.—Standard.

CAPITAL AND LABOUR.

SUNDERLAND BUILDING TRADE DISPUTE.—The stonemasons at Sunderland have agreed to accept a reduction of 4d. per hour. The masters asked for a reduction of 1d. but, after several conferences, a compromise was arranged. Under these circumstances there will be no stoppage in this branch of the building trade at Sunderland. The joiners have agreed to a reduction of 4d. an hour, bringing their wages down to 94d. The representatives of the bricklayers refused, at a meeting recently, to accept a modified offer of the masters, whereby their wages would be reduced 4d. per hour. The employers have intimated that, failing an acceptance of this proffered compromise, a reduction of 1d. would be insisted upon.

NEWCASTLE BUILDING TRADE DISPUTE.—On Saturday, last week, a conference was held in Newcastle of delegates of the men out on strike in the building trade. The object was to see whether uniformity of hours amongst the

injunction was granted last sittings, and defendant proceeded with his building on the ordinary course, and his new premises now reached a height of about 32 ft.

Mr. E. Jenkins, K.C., Mr. Sebastian, and Mr. Carson Road appeared for the plaintiffs, and Mr. Upjohn, K.C., and Mr. J. Tanner for the defendant.

At the close of the evidence and the addresses of counsel, his lordship, in giving judgment, said that, as this was the first light and air case, he had been called upon to decide since the decision in the *Collis* case by the House of Lords, and he wished to say a few words as to his understanding of that case. He thought it was clear that the present action would never have been defended had it not been for that judgment.

There was a general impression that the decision in the *Collis* case had disturbed the law, and that things more than his existing premises had disturbed the law. He had thought it actually had. He had considered the judgments delivered in the cases of *Kine v. Jolly* and *Ambler v. Ambler*. He had put down the result in writing, and it was as follows:—"Apart from express contract or grant, the owner of a house has no right to any access of light to the premises, and his neighbour's land cannot be acquired by prescription or otherwise under the Act. When he has so acquired it, he has a house with an easement of light attached to it. Any substantial interference with the comfortable use and enjoyment of his house, according to the usages of ordinary persons, is actionable as a nuisance under the law. His neighbour's brick-burn, or a fried-fish shop may be a nuisance in respect of smell, his pestle and mortar in respect of noise, and in like manner his neighbour's new building may be a nuisance in respect of light. The difference between the right to light and the right to freedom from light is that the former has to be established as an easement in addition to the right of property before it can be enforced, the latter, *ab initio*, incident to the right of property. But the wrong done is in both cases the same—viz., the disturbance of the owner in his enjoyment of his house. Inasmuch as the acquisition of the easement was a necessary condition precedent to the right to the Courts appear, in many cases, to have pressed themselves rather to the extent of easement acquired, and the amount of such easement taken away by the defendant, than to the sufficiency for ordinary purposes of the right of light left, so much so that many cases can be found that lend support to the argument that the right to light was a right of property for which trespass would lie. The owner was never entitled, either by prescription or under the Act, to all the light that came through his windows. It was not enough to show that some light had been taken away, but the question always was whether or not it had been taken as to cause a nuisance. For many years the tendency of the Courts has been to measure the nuisance by the amount taken from the light acquired, and not consider whether the amount left was sufficient for the reasonable comfort of the house according to ordinary requirements. If it was not, the house was held to be a nuisance. It was treated as a nuisance if he was deprived of a substantial part of it, even although a fair amount for ordinary purposes was left. It is in this respect that *Collis*' case has, to my mind, adjusted the law. It is still as it always has been, a question of nuisance or no nuisance; and the test of nuisance is not how much light has been taken, and is that enough materially to lessen the enjoyment and use of the house as his owner previously had, but how much light, and is that enough for the comfortable use and enjoyment of the house according to ordinary requirements of mankind. This was the direction in *Back v. Stacey*. Chief Justice Best told the jury, who had viewed the premises, that they were to judge rather from their own ocular observation than from the testimony of any witnesses, however respectable, of the degree of diminution which the defendant's ancient lights had undergone. It was not sufficient to constitute an illegal obstruction that the plaintiff had, in fact, less light than before; nor that his warehouse, the use of his house principally affected, could not be used for all the purposes to which it might otherwise have been applied. In order to get a right of action and sustain the issue, there must be a substantial privation of light sufficient to render the occupation of the house uncomfortable and to prevent the plaintiff from carrying on his accustomed business (that is, a process) on the premises as beneficially as had formerly been done. Chief Justice Best said that it might be difficult to draw the line, but the jury must distinguish between a substantial privation and a real injury to the plaintiff in the enjoyment of the premises."

But the case of nuisance by interference with light on the same footing as other cases

of nuisance—viz., noise; for apart from the question of locality, which was always important in considering the question of nuisance or no nuisance, the fact that the owner of a house had enjoyed exceptional quiet gave him no right to more than the ordinary freedom from extraordinary noises. The practical difference arose from the necessary limitation of the plaintiffs' rights by the extent of his ancient lights. Turning to the facts in the present case, his lordship said they were reasonably simple. The plaintiffs were, respectively, the lessee and the owners of the Red Lion public-house. It had an exceptionally good light to the west, where it faced over a large open space. The front, which formed the subject of the present action, was not in Cow Cross-street, but in Benjamin-street, which was a narrow street of 13 ft. Opposite to the plaintiffs' premises was an old building which, at a certain point, had a large gap in it. The defendant proposed to build up the whole of that gap, and add a height of 6 ft. along the whole of the building. He had no hesitation in finding that the erection of a house so close to the plaintiffs' premises would have such an effect upon the plaintiffs' windows as to be a nuisance. The windows he found to be affected were these: First of all the window of the private bar was affected, but, in this case, it was not very large. The damage to the light of the saloon bar was very serious, and he found, as a fact on the evidence, that before the defendant's building was erected the saloon bar, by reason of the gap, was a reasonably well-lighted, and comfortable room. It was now a dark and gloomy room, and the business of the plaintiffs was very seriously and prejudicially affected. In the dining-room the plaintiffs were left 32 deg. of light only in the place of 79 deg. He had to consider what was left, and not what had been taken away. The defendant had put up a wall where there had been an open space before. He thought this constituted a most material and substantial privation of light, sufficient to render the occupation of the house uncomfortable, and to prevent the plaintiffs from carrying on their accustomed business on the premises as beneficially as they had formerly done. His lordship said he would grant an injunction in the *Yates v. Jack* form, with the addition of "as to as to a nuisance," and with the qualification which counsel had agreed on. There would be liberty to apply as to a mandatory injunction, but he hoped that the architects on both sides would be able to come to some reasonable arrangement, and so prevent the case coming back for consideration again.

AN ARCHITECT'S CLAIM.

In the Lord Mayor's Court, last week, before Mr. Bosanquet, K.C., Common Sergeant, sitting without a jury, Mr. W. H. Burt, architect and surveyor, of Bush-lane, Cannon-street, sued Mr. W. F. Revill, builder, for forty guineas for professional services rendered. The plaintiff's claim was made up of two items of twenty guineas each, and in respect of one of the items the defendant paid 100 l. into Court. Mr. Frank Dodd (instructed by Mr. Hammond) was counsel for the plaintiff, and Mr. Walter Payne (instructed by Mr. Pearce) represented the defendant. The plaintiff said that the first item claimed was in respect of services rendered by him in a "light and air" action, the (plaintiff) being instructed to act as the surveyor. The second item was for preparing drawings and a draft specification of buildings which the defendant proposed to erect in Hatfield-street. Where the erection of buildings was not carried out an architect was entitled to charge 1 per cent. on the probable cost. The buildings would have been of the value of 6,000 l. or 7,000 l., and therefore he (plaintiff) was entitled to charge considerably more than the twenty guineas claimed. The defendant denied liability to pay the plaintiff anything in respect of the first item, the work having been done through the instructions of another person. A sum of 100 l. was paid into Court to satisfy the latter demand. The Common Sergeant found in favour of the plaintiff.—*City Press*.

PATENTS OF THE WEEK.

APPLICATIONS FOR PATENTS.

14,070 of 1904.—J. H. CARTLAND and J. LILLY: Apparatus for Opening and Closing Swinging Windows, Ventilators, Fanlights, or similar Swinging Bodies.

Apparatus for closing and opening swinging windows, ventilators, fanlights, and the like, consisting in the combination of a spindle having a worm solidly formed thereon; a cord operating wheel, a rack gear wheel simultaneously engaging with said rack and the

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

said worm, a two-part box member in which said gearing and rack are enclosed, said box part being provided with suitable bracket for attachment to the casement or the fixture.

14,427 of 1904.—J. C. SNELLING: Concrete Partition Slab for Building Purposes.

This invention has for its object to provide a slab for building purposes. The slab is adapted for forming partitions, and the like, and is moulded, pressed, or otherwise formed from a composition of furnace slag particles and Portland cement, ground or crushed in a mill to such a size as to be able to pass through a 4-in. ring. This concrete slab is formed with any desired number of tapered or conical holes or perforations running through the slab, and when the slabs are built into the partition the said perforations are vertically disposed and tapered towards the lower side. The concrete slabs serve to resist the action of damp, and are sound-proof. They may be combined or locked together by being feathered and grooved at their opposite sides.

14,775 of 1904.—J. S. DUMBLELL and A. G. KIRBY: Locks.

This invention relates to locks, and has for its object to construct a simple and reliable form of lock which, whilst necessitating the use of a key to effect its opening or releasing, can be conveniently closed or secured without such use of a key by external operation of the bolt or catch releasing mechanism. This invention comprises employment, in combination with a sliding bolt or other locking element, of an abutment piece arranged to automatically engage and retain the said locking element when the latter is withdrawn to its innermost position, and adapted to be readily pressed out of engagement when it is desired to release the locking element for the purpose of closing or securing the lock. In one manner of applying this invention to the construction of a lock suitable for use with a travelling trunk, a sliding bolt is employed, carried by guide-pieces within an enclosing case of any ordinary and convenient form. Upon suitable supports, secured to the back plate of the lock, an abutment-piece is loosely mounted and adapted to engage an extending shoulder provided upon the sliding bolt when the said bolt is in its innermost position. The abutment-piece is retained in engagement with the sliding bolt by means of suitable springs. Upon the abutment-piece a projecting stud is provided and arranged to pass through the front plate to the exterior of the lock casing. In conjunction with the sliding bolt an actuating spring is employed whereby the said bolt can be advanced to and retained in its outer or locking position. By means of a suitable key the bolt can be withdrawn against the resistance of its spring to the innermost position, where it is retained by the engagement of the said abutment-piece.

14,860 of 1904.—C. DEAN and J. W. REDFERN: Kilns for Drying and Burning Bricks, Tiles, or the like.

This invention relates to continuous kilns having a number of chambers separated by division walls, and the objects are to construct a kiln and arrange the flues, dampers, fire-grates, etc., so that more effective drying and warming, burning, soaking and cooling of the whole of the articles in the chamber can be obtained. This is accomplished by providing means for supplying heated or cold air, or a mixture thereof, to each chamber or for entirely closing all openings to each chamber. In carrying out this invention openings are formed in the division walls near the bottom, and dampers are provided of freelay slabs, movable in slots in the walls, to regulate or close the openings. The tops or arches of the chambers are provided with the usual feed-holes and flues connected therewith, controlled by dampers, and leading to the hot-air flue and smoke flue. From the hot-air flue damper-controlled flues lead into the bottom of the chambers underneath fire-grates preferably at one end of each chamber, guarded by a flash wall. A damper-controlled passage from the outer air leads into the flue under the grates. Some of the feed-holes are disposed directly above the fire-grates, so that fuel may be dropped thereon, or the grates can be fired from side wickets if desired.

14,862 of 1904.—E. RAYBONE: Reversible Latching-bolts of Locks and Latches.

Means for use with a latch-bolt of a lock or latch, or a portion of a latching-bolt of a lock or latch, which is adapted to be reversed without removal of the bolt or cap plate of the case, which comprises a stop-piece having a portion within the case which may be turned into a position which prevents such bolt or such portion of a bolt from becoming accidentally disconnected from the part by which it is directly operated, and may be turned into a position which allows such bolt or such portion of a bolt to be disconnected from such

part reversed and again connected therewith, said portion of the stop-piece being pivoted to the case by a pin through the medium of which it is turned from the exterior of the case.

24,579 of 1904.—A. G. HARLEY-JONES: *Manufacture of Vases, Flower Pots, Baskets, Toilet Sets, and other Articles of Pottery.*

This invention relates to the manufacture of vases, flower pots, baskets, toilet sets, and other articles of pottery. In carrying out this invention the articles are shaped in the usual manner in plaster moulds, the surfaces of which have a pattern border or panel produced by piercing, boring, incising, or engraving. This panel is designed to encircle a lithographic or other picture, to be subsequently applied, and around the incised parts, which appear on the raised articles, gold is applied for purposes of decoration, or a solid face of gold may be arranged to surround the lithographic or other picture, this face extending up to and covering the border. This border is patterned in the manner described, that is to say, inside the border or panel, and approaching the picture-holes or patterns are incised or bored so as to give raised gold effects when finished.

27,834 of 1904.—J. JONES and J. OAKES: *Means for Fixing Seat-pads, Rims, and the like to Closets, Sinks, and the like.*

This invention relates to the fixing of seat-pads, seat-rims, closet seats, or protecting pads of hardwood or other material to flushing rims or that part upon which seats, rims, pads are fixed, of closets or edges of sinks and the like articles. Hitherto, seats, etc., have been fixed to flush rims of closets or sinks by means of an L-bolt and one screw, which had to be passed through open rim or open slots on under side, and which open rims or slots sometimes did not allow proper cleansing of the closet or sink. The improved L, or other shaped bolt fitting, has two screw-nuts, and is adapted to be applied through top of seat, rim, or top bed of the sink, thus allowing of a close or perforated rim on under side. This L or other shape bolt, after having passed through hole in rim is held in position, and first nut screwed home, thus allowing the pad or seat to be placed in position and screwed down secure by top bolt in usual way. The fixing of the bolt by first screw firmly secures it so that it cannot possibly be disturbed by the fitting on of seat rim.

27,885 of 1904.—S. E. MAAS: *Apparatus for the Manufacture of Strengthened Paper or Card-board for Roofing, Fencing, Pipes, Packing, and the like.*

A process of manufacture of strengthened paper or cardboard in a continuous sheet, consisting in the introduction of a continuous metallic netting into the interior of the thickness of paper or cardboard during the formation of the layer of paper or cardboard by means of pulp, a support for the reel upon which the netting is wound placed immediately after the pulp strainer, a tension roller and guide-bars under which the netting successively passes, and an endless apron by which the netting is carried along with the pulp.

1,192 of 1905.—J. LANG: *Platform Elevators.*

Platform elevators, characterised by the fact that the corner supports are formed of pairs of chains which are interlocked at a suitable angle, the said chains of platform, characterised by dovetail tenons and mortices interlaced successively along one edge of each chain, each mortice being distributed between two links and being also opposite a corresponding dovetail tenon on the other chain of a pair, apparatus for winding up and off the chains of the platform, characterised by rollers arranged at an advanced angle to one another with projections which engage in each pair of chains, and by which the doubled chains can be pushed up into position for supporting the platform at the desired height.

1,883 of 1905.—R. KÖRNER: *A Device for Changing the Length of the Legs of Furniture.*

This invention has for its object a device for changing the length of the legs of such pieces of furniture, and so on, which, owing to the unevenness of the floor or any other place, they stand on, cannot be put up as desired. According to the invention, a bell-shaped ring is placed around the leg which is to be lengthened, and secured by a screw bolt. By means of this screw bolt the width of the ring can be changed and it can be made to suit the different thicknesses of legs of furniture. At any desirable place of the ring an eye, or the like, is provided in which can be moved up and down, and fixed, a sliding-piece with a ring of teeth. The fixing device consists of a bolt standing under the action of a spring.

4,187 of 1905.—J. W. BARTELS and G. DE LA PORTE: *Cement Brick-moulding Machines.*

This invention relates to cement brick-moulding machines, and has for its object to provide means for ramming the cement or the like material into the moulds. Hitherto the ramming in of the cement mortar was effected by ramming the material into the moulds with a hand hammer, or the like. The moulding machine comprises a box, mounted on standards, which box is divided by partitions into brick moulds of the required size and shape, these partitions being attached by screws to the standard frame by means of angle-irons. The bottom plate of the moulds is arranged movable, so that it can be made to slide forward or backward by a wheel operated by a handle, and operating a shaft provided with pinions gearing into racks fixed under the bottom plate. The moulds are closed in front by a plate, adapted to swing back horizontally on hinges, and secured by a locking-bolt on the frame. For convenient removal of the ready moulded bricks, a second plate, adapted to be lifted off, is superposed on the bottom plate, so that it can be removed together with the bricks upon it, and replaced in the course of operation by similar plates.

10,924 of 1904.—A. H. BARKER: *Hot Water Heating Apparatus.*

A method of heating rooms and buildings by means of radiators, consisting in the combination of a radiator mounted on wheels or castors, and having the inlet or inflow and outlet or return flow openings combined in one plug, or spigot, or socket part of a connexion, outflow and return pipes from same source supplying the heating fluid having their ends combined in one wall plug, or spigot, or socket part of a wall connexion, and a flexible double flow pipe having the separate passage ends at one of the same end of the pipe combined in one plug or socket part of a connexion, so that the inlet or inflow passages lead towards the radiators of all three—i.e., radiator, flexible pipe, and wall plug—are connected or communicate with each other, and the return or outflow passages of all three likewise are connected or communicate with each other, by the mere connecting up of the ends of the flexible pipe to the radiator and wall plug respectively.

14,777 of 1904.—J. C. VERREX: *Ventilating of Public Buildings, Houses, Shops, and the like.*

This invention relates to the construction of, firstly, a revolving cowl in such a manner that an air sail or scoop is formed, and always kept facing the wind in such a manner that fresh air is forced downward through an annular space, for subsequent conveyance to any desired place, and at the same time an exit pipe end is arranged at the opposite side at a higher level than the intake, and in such a manner that the passing air assists in drawing foul air up the said pipe. The air pipe or shafts are constructed of an inner and outer tube, the inner forming the upcast or foul air shaft and the outer the downcast or pure air shaft. Suitable connexions between the upcast and the upper portions of rooms to be ventilated will be made through the annular ring forming the downcast; also suitable connexions between the downcast and the lower portions of the rooms. Automatic doors can be attached to each inlet and outlet for controlling the ventilation. The revolving cowl works on ball bearings of the usual construction.

16,400 of 1904.—E. D. DE LIEBHABER: *Method for Preserving the Surfaces of Macadamised Roads and Streets.*

The object of this invention is to preserve the surfaces of macadamised roads and streets and other surfaces subjected to traffic by preventing the disintegration and grinding of the stone and other road material, and, secondly, the formation of dust resulting from such disintegration and grinding. In the case of macadamised roads or streets already constructed which it may be desired to preserve, it is necessary to proceed as follows, choosing dry weather, so as to have a dry road surface capable of well absorbing liquid substance:—All refuse is removed by means of a horse broom, without sweeping the road. The road is then well sprinkled with a solution of calcium chloride of 20 deg. to 24 deg. Beaumé, at the rate of about 200 gallons of such solution per 1,000 sq. yds., supplied from an ordinary water-cart furnished with a spreader ensuring steady distribution. The solution is then allowed to penetrate the road surface, and on the next day, if the weather is dry, the operation is repeated with a solution of about one-half the above strength, also distributed at the rate of about 200 gallons per 1,000 sq. yds. Afterwards the dressings are repeated with a solution of the latter strength in the same manner at progressively increasing intervals of time.

16,788 of 1904.—H. G. V. RYDAHL: *Fire-proof Skeleton Floorings.*

This invention relates to fire-proof skeleton floorings, consisting of iron or cement beams of I-shaped cross-section and cast-iron hollow plugs inserted between said beams. The object of the invention is to obtain floorings which are strong and cheap and at the same time present smooth and flat floor and ceiling surfaces above and below the beams. According to the invention plugs of cement or other similar material are inserted between iron or cement beams of I-shaped cross section, the said beams being, preferably, coated by a sound-deadening material—for instance, pasteboard or the like. The said plugs rest direct on the lower flanges of the beams or on the said coating by means of the upper sides of screws provided at the bottom of the plug ends. Furthermore, the plugs are at their ends formed with comparatively large flat surfaces, by means of which the plugs bear against the web of the beams or against the aforesaid covering. At the top of the ends the plugs are bevelled in order to enable the plugs to be conveniently inserted between the beams. Finally the upper and under sides of the plugs are flat, and the plugs are of such thickness that with their upper and under sides they form smooth and flat floor and ceiling surfaces, which extend both above and below the beams.

TO CORRESPONDENTS.

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We cannot undertake to return rejected communications, and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for their return.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any communication to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisement and other exclusively business matters should be addressed to THE PUBLISHERS, and not to the Editor.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.		
May 11.—By COOK & BROS. (at Llandudno), Llandudno, Montg.—“The Penzance Estate,” 291 a. 0 r. 2 p., £1,000, £4,350		
“Verdoddefield Meadow,” 7 a. 1 r. 8 p., £1,000, 30g		
May 16.—By MORRIS, SOYS, & FRANK (at Clun), Clun, Salop.—“The Pitts Farm,” 31 a. 0 r. 8 p., £1,000, £4,410		
By R. PENNINGTON (at Birmingham), Isleworth, Midd.—“The Grove, four blocks of freehold building land (in lots), £1,000, £4,765		
By E. G. RIGHTON (at Evesham), Alstone, Glos.—“Alstone Farm,” 265 a. 3 r. 21 p., £1,000, £4,535		
May 17.—By HARGRELL & SONS (at Bagshot), Bagshot, Surrey.—“High-st., ‘Crownright House’ (business premises), 7 r. 106 a. 10k, also two cottages adjoining, £1,000, £2,000		
High-st., “The Red Lion” and shop adjoining, £1,000, £2,000		
Guldford rd., three freehold building plots, £1,000, £250		
London-rd., a freehold building plot, £1,000, £250		
By E. G. RIGHTON (at Basingstoke), Basingstoke, Hants.—“Hardwick Farm,” 422 a. 3 r. 0 p., £1,000, £16,325		
May 18.—By W. BURGESS (at New Deal, Kent), “The Middle Deal,” “Try House,” and 8 a. 2 r. 15 p., £1,000, £1,280		
By W. WIGMORE (at Sheerness), Eastchurch, Isle of Sheppey.—“Part of Sheep-pitt Farm,” 82 a. 3 r. 36 p., £1,000, £760		
By LANGRISH & FREEMAN (at Maidstone), East Peckham, Kent.—“Snail Hatch Meadows,” 201 acres, £1,000, £600		
“Island Field,” 10 a. 2 r. 1 p., £1,000, £200		
“Latters Field,” 1 a. 2 r. 1 p., £1,000, £100		
Stansted, Kent.—“The Hook and Hatch” (two cottages), 59 yds., £1,000, £150		
w.r. 101. 10s., £1,000, £200		
C o m p. £ a. s. £1,000, £200		
By BORTON SONS & CO. (at Waltham Cross), Fulham, 62, Waldemar-av., 40 yds., £1,000, £745		
71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, £1,000, £1,000		
10 to 20 (even), Burlington-rd., 44 yds., £1,000, £1,000		
10 High-st. (s. w.), £1,000, £1,000		
7 r. 46s., £1,000, £1,000		

[illegible]

By MONTAGU & ROBINSON.
Brompton.—Cathcart rd., l.g. rents 65L, u.t.
57½ yrs., g.t. 7L (with reversion) £1,855

By TURNER & CO.
Marylebone.—8, 9, 13, 17, and 27, Shouldham-
st., l.y. 223L 4,466
8 and 9, Molyneux-st., l.y. 100L 2,000
51, Molyneux-st. (s.), l.y. 60L 1,190
Molyneux-st., s. rent charge of 21L 510

Contractions used in these lists.—E.g., for freehold ground-rent; l.g. for leasehold ground-rent; l.g. for improved ground-rent; g.t. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.t. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cro. for crociat; av. for avenue; gdu. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

SATURDAY, JUNE 3.

Royal Institution.—Mr. A. H. Savage Landor on "Exploration in the Philippines," 1. 3 p.m.
Northern Architectural Association.—Visit to Whitley Schools, S. George's Church, Cultercoats, and Tyne-mouth Priory, etc.

MONDAY, JUNE 5.

Society of Engineers.—Mr. G. Scott Meik and Mr. W. Beut on "The Improvement of London Traffic," 8 p.m.
Royal Institute of British Architects.—Business Meeting to (1) receive report of the scrutineers appointed to direct the election of the Council, Standing Committee, etc.; (2) to elect candidates for membership; (3) to resume discussion on the Institute paper on the Conduct of Architectural Competitions as revised by the Competition Committee. The motion upon which the discussion adjourned was a proposition of Mr. C. E. Hutchinson that the Council be associated with the President in advising promoters as to their appointment of scrutineers; and an amendment by Mr. George Hubbard, F.R.S.A., that the matter be referred back to the Competitions Committee. Mr. Horace T. Bonner to bring forward the following motion:—That in the event of the President or Council being applied to by promoters of competitions to nominate competing architects, notice of such application shall be published in the *Journal*, and members of the Royal Institute of British Architects who are willing to take part in such competitions be invited to send in their names for selection by ballot as competitors." 8 p.m.

TUESDAY, JUNE 6.

Royal Institution.—The Rev. H. G. Woods, D.D., on "Velasquez III. The Impressionist," 8 p.m.

WEDNESDAY, JUNE 7.

Builders' Foremen and Clerks of Works' Institution.—Ordinary Meeting of the Members, 8 p.m.

THURSDAY, JUNE 8.

Royal Institution.—Professor J. A. Fleming, M.A., on "Electromagnetic Waves," III, 6 p.m.

SATURDAY, JUNE 10.

Royal Institution.—Mr. A. H. Savage Landor on "Exploration in the Philippines," II, 3 p.m.
Edinburgh Architectural Association.—Visit to Inchcolm.

PRICES CURRENT OF MATERIALS.

* * Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.	
# s. d.	
Hard Stocks.....	1 10 0 per 1000 alongside, in river.
Bought Stocks and	
Grizzles.....	1 6 6 " " " "
Facing Stocks.....	2 2 0 " " " "
Shippers.....	2 2 0 " " " "
Plethons.....	1 7 0 " " " "
Red Wire Cuts.....	1 14 0 " " " "
Best Furcham Bed	3 12 0 " " " "
Best Red Pressed	
Buabon Facing	5 0 0 " " " "
Best Blue Pressed	
Staffordshire.....	4 2 6 " " " "
Do. Bullnose.....	4 7 6 " " " "
Best Stourbridge	
Fire Bricks.....	4 0 0 " " " "
Glazed Bricks.....	
Best White and	
Ivory Glazed	
Stretchers.....	12 0 0 " " " "
Headers.....	11 0 0 " " " "
Quoins, Bullnose,	
and Flats.....	16 0 0 " " " "
Double Stretchers	19 0 0 " " " "
Double Headers.....	16 0 0 " " " "
One Side and two	
Ends.....	19 0 0 " " " "
Two Sides and	
one End.....	20 0 0 " " " "
Spays, Cham-	
ferred, Squints	20 0 0 " " " "
Best Dipped Salt	
Glazed Stretch-	
ers, and Header	12 0 0 " " " "
Quoins, Bullnose,	
and Flats.....	14 0 0 " " " "
Double Stretchers	15 0 0 " " " "
Double Headers.....	14 0 0 " " " "
One Side and two	
Ends.....	15 0 0 " " " "
Two Sides and	
one End.....	15 0 0 " " " "
Spays, Cham-	
ferred, Squints	14 0 0 " " " "
Second Quality	
White and	
Dipped Salt	
Glazed.....	2 0 0 " " " "

less than best.

BRICKS, &c. (continued).

# s. d.	
Thames and Pit Sand.....	7 0 per yard, delivered.
Thames Ballast.....	5 9 " " "
Best Portland Cement.....	0 0 per ton, "
Best Ground Blue Lias Lime	20 0 " " "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.

Stourbridge Fireclay in sacks 2s. 0d. per ton at rly. dpt.

STONE.

# s. d.	
BATX STONE—delivered on road wag-	
gons, Paddington Depot.....	1 6½ per ft. cube.
Do. do. delivered on road wag-	
gons, Nine Elms Depot.....	1 8½ " " "
PORTLAND STONE (20 ft. average)—	
Brown Whitbed, delivered on road	
wagons, Paddington depot, Nine	
Elms depot, or Fimlico Wharf.....	2 1 " " "
White Bassebed, delivered on road	
wagons, Paddington depot, Nine	
Elms depot, or Fimlico Wharf.....	2 2½ " " "

ANCASTER IN BLOCKS.....1 11 per ft. cube, deld. rly. depot.

Beer.....1 6 " " "

Greenhill.....1 10 " " "

Darley Dale in blocks.....2 4 " " "

Red Cornehill.....2 5 " " "

Closeturn Red Freestone.....2 0 " " "

Red Mansfield.....2 4 " " "

YORK STONE—Robin Hood Quality.

Scrapped random blocks 2 10 " " "

6 in. sawn two sides

landings 2 3 per ft. super. " "

6 in. rubbed two sides

ditto, ditto.....2 6 " " "

8 in. sawn two sides

slabs (random sizes) 0 11½ " " "

2 in. to 2½ in. sawn one

side slabs (random

sizes) 0 7½ " " "

1½ in. to 2 in. ditto 0 6 " " "

HARD YORK—

Scrapped random blocks 3 0 per ft. cube, " "

6 in. sawn two sides,

landings 2 3 per ft. super. " "

6 in. rubbed two sides

ditto.....3 0 " " "

8 in. sawn two sides

(slabs random sizes) 1 2 " " "

2 in. self-faced random

flags.....0 5 " " "

HOPTON WOOD (Hard Red) in blocks 2 0 per ft. cube,

deld. rly. depot.

" " " 6 in. sawn both

sides landings 2 7 per ft. super,

deld. rly. depot.

" " " 3 in. sawn both

sides random

slabs 1 0 " " "

" " " 2 in. do. 0 8½ " " "

SLATES.

s. d.

20 x 10 best blue Bangor 13 2 6 per 1000 of 1200 at r. d.

20 x 12 " " " 13 17 6 " " "

20 x 10 first quality " 13 0 " " "

20 x 12 " " " 13 15 0 " " "

16 x 8 " " " 7 5 0 " " "

20 x 10 best blue Port-

madoc.....12 12 6 " " "

20 x 10 best Eureka un-

fading green.....15 17 6 " " "

20 x 12 " " " 13 17 6 " " "

18 x 10 " " " 13 5 0 " " "

16 x 8 " " " 10 5 0 " " "

20 x 10 permanent green 11 12 6 " " "

18 x 10 " " " 9 12 6 " " "

16 x 8 " " " 6 12 6 " " "

TILES.

s. d.

Best plain red roofing tiles.....43 0 per 1000 at rly. depot.

Hip and Valley tiles.....3 7 per doz. " "

Do. Drossely tiles.....50 0 per 1000 " "

Do. Ornamental tiles.....59 6 " " "

Hip and Valley tiles.....4 0 per doz. " "

Best Eubon red, brown, or

brindled do. (Edwards) 57 6 per 1000 " "

Do. Ornamental do.....60 0 " " "

Hip tiles.....4 0 per doz. " "

Valley tiles.....3 0 " " "

Best Red or Mottled Stafford-

shire do. (Peakes) 51 8 per 1000 " "

Do. Ornamental do.....54 6 " " "

Hip tiles.....4 1 per doz. " "

Valley tiles.....3 8 " " "

Best "Rosemary" brand

plain tiles.....48 0 per 1000 " "

Best Ornamental tiles.....50 0 " " "

Hip tiles.....4 0 per doz. " "

Valley tiles.....3 8 " " "

Best "Hartshill" brand

plain tiles, sand faced, 50 0 per 1000 " "

Do. pressed.....47 6 " " "

Do. Ornamental do.....50 0 " " "

Hip tiles.....4 0 per doz. " "

Valley tiles.....3 6 " " "

WOOD.

At per standard.

Deals: best 3 in. by 11 in. and 4 in. # s. d.

by 9 in. and 11 in.....13 10 0 15 0 0

Deals: best 3 by 9.....13 0 0 14 0 0

Battens: best 2½ in. by 7 in. 11 0 0

8 in. and 3 in. by 7 in. and 5 in. 11 0 0 13 0 0

Battens: best 2½ by 6 and 3 by 6.....10 0 0 less than

best.

Deals: seconds.....1 0 7 in. and 8 in.

Battens: seconds.....0 10 0 less than best.

2 in. by 4 in. and 2 in. by 6 in.....9 0 0 10 0 0

2 in. by 4 in. and 2 in. by 6 in.....8 10 0 9 10 0

Foreign Saw Boards.....

1 in. and 1½ in. by 7 in. 0 10 0 more than

battens.

2 in. 1 0 0 " "

WOOD (continued).

# s. d.	
BUILDING WOOD (continued).	
Fire timber: best midding Danzig	
or Memel (average specification) 4 10 0	
Second.....4 0 0 4 10 0	
Small timber (3 in. to 10 in.).....3 10 0 3 10 0	
Small timber (6 in. to 8 in.).....3 0 0 3 0 0	
Swedish balks.....3 10 0 3 10 0	
Pitch-pine timber (50 ft. average) 3 5 0	
Joistings: WOOD.	
White Sea: first yellow deals,	
3 in. by 11 in. and 3 in. by 7 in. 24 0 0	
8 in. by 8 in. 22 0 0 22 0 0	
Battens, 2½ in. and 3 in. by 7 in. 15 0 0 15 0 0	
Second yellow deals, 3 in. by 11 in. 12 0 0 12 0 0	
11 in. 13 10 0 13 10 0	
3 in. by 9 in. 12 10 0 12 10 0	
and 9 in. 13 10 0 13 10 0	
Third yellow deals, 3 in. by 11 in. 13 10 0 13 10 0	
Battens, 2½ in. and 3 in. by 7 in. 15 0 0 15 0 0	
Petersburg: first yellow deals,	
3 in. by 11 in. 22 0 0 22 0 0	
Do. 8 in. by 9 in. 18 0 0 18 0 0	
Battens.....12 10 0 12 10 0	
Third yellow deals, 3 in. by 11 in. 13 10 0 13 10 0	
11 in. 13 10 0 13 10 0	
Do. 8 in. by 9 in. 12 10 0 12 10 0	
Battens.....11 0 0 11 0 0	
White Sea and Petersburg:	
First white deals, 3 in. by 11 in. 10 10 0 10 10 0	
8 in. by 9 in. 13 10 0 13 10 0	
Battens.....11 0 0 11 0 0	
Second white deals, 3 in. by 11 in. 10 10 0 10 10 0	
8 in. by 9 in. 13 10 0 13 10 0	
Battens.....11 0 0 11 0 0	
Pitch-pine: deals.....14 10 0 14 10 0	
Under 2 in. thick extra.....2 0 0 2 0 0	
Yellow Pine—First, regular sizes 4 0 0 upwards.	
Oddments.....3 0 0 " "	
Seconds, regular sizes.....0 1 " "	
Yellow Pine oddments.....2 0 0 " "	
Kauri Pine—Planks, per ft. cube, 0 3 6 0 5 0	
Danzig and Stettin Oak Logs—	
Large, per ft. cube.....0 3 0 0 3 0	
Small.....0 2 6 0 2 6	
Wainscot Oak Logs, per ft. cube, 0 5 0 0 5 0	
Dry Wainscot Oak, per ft. sup. as	
inch.....0 0 8 0 0 8	
Selected, Figury, per ft. sup. as	
inch.....0 0 7 " "	
Dry Mahogany—Honduras, Ta-	
basco, per ft. super. as inch.....0 0 9 0 1 0	
Selected, Figury, per ft. sup. as	
inch.....0 0 8 0 0 8	
Dry Walnut, American, per ft. sup.	
as inch.....0 0 10 0 1 0	
Teak, per load.....17 0 0 17 0 0	
American Whitewood Planks,	
per ft. cube.....0 4 0 0 4 0	
Prepared Flooring, etc., Per square.	
1 in. by 7 in. yellow, planed and	
shot.....0 13 6 0 17 " "	
1 in. by 7 in. yellow, planed and	
matched.....0 14 0 0 18 " "	
1½ in. by 7 in. yellow, planed and	
matched.....0 16 0 0 18 0 0	
1 in. by 7 in. white, planed and	
shot.....0 12 6 0 14 6 0	
1 in. by 7 in. white, planed and	
matched.....0 13 6 0 15 6 0	
1½ in. by 7 in. white, planed and	
matched.....0 15 0 0 16 6 0	
2 in. by 7 in. yellow, matched	
and beaded or V-jointed brds. 0 11 0 0 13 6 0	
1 in. by 7 in. do. do. 0 10 0 0 11 6 0	
1½ in. by 7 in. white do. 0 13 6 0 15 6 0	
1 in. by 7 in. do. do. 0 13 6 0 15 6 0	
6 in. at 6d. to 8d. per square less than 7 in.	

JOISTS, GIRDERS, &c.

In London, or delivered
Railway Vans, per ton.

s. d. # s. d.

Rolled Steel Joists, ordinary

sections.....7 10 0 8 10 0

Compound Girders, ordinary

sections.....9 2 6 10 12 6

Steel Compound Stanchions.....

Angles, Tees and Channels, ordi-

nary sections.....7 10 0 8 10 0

Flitch Plates.....16 10 0 16 10 0

Cast Iron Columns and Stan-

chions including ordinary pat-

terns.....6 18 6 7 15 0

METALS.

Per ton, in London.

s. d. # s. d.

IRON—

Common Bars.....7 10 0 7 10 0

Staffordshire Crown Bars, good

merchant quality.....7 10 0 8 10 0

Staffordshire "Marked Bars".....9 10 0 9 10 0

Mild Steel Bars.....8 10 0 9 0 0

Hoop Iron, best price.....16 10 0 16 10 0

"Galvanized.....16 10 0 16 10 0

LEAD, &c.	Per ton, in London.
Sheet, English, 3lb. and up	15 12 6
Sheet, English, 2lb. and up	15 12 6
Sheet, English, 1lb. and up	15 12 6
Sheet, English, 3/4lb. and up	15 12 6
Sheet, English, 1/2lb. and up	15 12 6
Sheet, English, 1/4lb. and up	15 12 6
Sheet, English, 1/8lb. and up	15 12 6
Sheet, English, 1/16lb. and up	15 12 6
Sheet, English, 1/32lb. and up	15 12 6
Sheet, English, 1/64lb. and up	15 12 6
Sheet, English, 1/128lb. and up	15 12 6
Sheet, English, 1/256lb. and up	15 12 6
Sheet, English, 1/512lb. and up	15 12 6
Sheet, English, 1/1024lb. and up	15 12 6
Sheet, English, 1/2048lb. and up	15 12 6
Sheet, English, 1/4096lb. and up	15 12 6
Sheet, English, 1/8192lb. and up	15 12 6
Sheet, English, 1/16384lb. and up	15 12 6
Sheet, English, 1/32768lb. and up	15 12 6
Sheet, English, 1/65536lb. and up	15 12 6
Sheet, English, 1/131072lb. and up	15 12 6
Sheet, English, 1/262144lb. and up	15 12 6
Sheet, English, 1/524288lb. and up	15 12 6
Sheet, English, 1/1048576lb. and up	15 12 6
Sheet, English, 1/2097152lb. and up	15 12 6
Sheet, English, 1/4194304lb. and up	15 12 6
Sheet, English, 1/8388608lb. and up	15 12 6
Sheet, English, 1/16777216lb. and up	15 12 6
Sheet, English, 1/33554432lb. and up	15 12 6
Sheet, English, 1/67108864lb. and up	15 12 6
Sheet, English, 1/134217728lb. and up	15 12 6
Sheet, English, 1/268435456lb. and up	15 12 6
Sheet, English, 1/536870912lb. and up	15 12 6
Sheet, English, 1/1073741824lb. and up	15 12 6
Sheet, English, 1/2147483648lb. and up	15 12 6
Sheet, English, 1/4294967296lb. and up	15 12 6
Sheet, English, 1/8589934592lb. and up	15 12 6
Sheet, English, 1/17179869184lb. and up	15 12 6
Sheet, English, 1/34359738368lb. and up	15 12 6
Sheet, English, 1/68719476736lb. and up	15 12 6
Sheet, English, 1/137438953472lb. and up	15 12 6
Sheet, English, 1/274877906944lb. and up	15 12 6
Sheet, English, 1/549755813888lb. and up	15 12 6
Sheet, English, 1/1099511627776lb. and up	15 12 6
Sheet, English, 1/2199023255552lb. and up	15 12 6
Sheet, English, 1/4398046511104lb. and up	15 12 6
Sheet, English, 1/8796093022208lb. and up	15 12 6
Sheet, English, 1/17592186444416lb. and up	15 12 6
Sheet, English, 1/35184372888832lb. and up	15 12 6
Sheet, English, 1/70368745777664lb. and up	15 12 6
Sheet, English, 1/140737491555296lb. and up	15 12 6
Sheet, English, 1/281474983110592lb. and up	15 12 6
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Sheet, English, 1/4503599729769472lb. and up	15 12 6
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Sheet, English, 1/36028797838155776lb. and up	15 12 6
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Sheet, English, 1/9578097124554887000895656206353030711104lb. and up	15 12 6
Sheet, English, 1/19156194249107740017911312412706061422208lb. and up	15 12 6
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Sheet, English, 1/98079714514313228891705918722550346489144lb. and up	15 12 6
Sheet, English, 1/19615942902862645783541183745100692977888lb. and up	15 12 6
Sheet, English, 1/39231885805725291567082367490201385955776lb. and up	15 12 6
Sheet, English, 1/78463771611450583134164734980402771911552lb. and up	15 12 6
Sheet, English, 1/15692754322290116626832946996080554222304lb. and up	15 12 6
Sheet, English, 1/3138550864458023325366589399216111084448lb. and up	15 12 6
Sheet, English, 1/6277101728916046650733178798422221768896lb. and up	15 12 6
Sheet, English, 1/12554203457832093301466357596844443537792lb. and up	15 12 6
Sheet, English, 1/25108406915664186602932715193688887075552lb. and up	15 12 6
Sheet, English, 1/5021681383132837320586543038737777411104lb. and up	15 12 6
Sheet, English, 1/10043362766265676401173088677475548222208lb. and up	15 12 6
Sheet, English, 1/20086725532531352802346173554951097444448lb. and up	15 12 6
Sheet, English, 1/4017345106506270560469234710990219488896lb. and up	15 12 6
Sheet, English, 1/8034690213012541120938468421980438977792lb. and up	15 12 6
Sheet, English, 1/1606938042602508241867693684396077795552lb. and up	15 12 6
Sheet, English, 1/3213876085205016483735387368792155591104lb. and up	15 12 6
Sheet, English, 1/642775217	

CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be received
School Desks	Bradford Education Committee ..	T. Garbutt, Sec., Manor-row, Bradford ..	June 5
Tar Paving School Playgrounds	do.	do.	do.
Signal Cabin at Ferrybridge Station	N.E. & Midland Railway Directors ..	W. J. Cadworth, Engineer, York ..	do.
Girders	Bongal and N.W. Railway Co., Ltd. ..	A. Izat, 237, Gresham House, Old Broad-street, E.C. ..	do.
Electric Lighting School of Art, Gt. Horton-road ..	Bradford Education Committee ..	City Architect, Whitaker-buildings, Brewery-street, Bradford ..	do.
580 yds. of Kerb. & Chan., Leeds & Bradford M'n Rd.	Calverley U.D.C.	W. Walker, Surveyor, Calverley U.D.C.	do.
Private Street Works, Howard-road, Southampton ..	Southampton Corporation	Borough Engineer's Office, Southampton ..	do.
Haulage of Stone, Flint, and Gravel	Doxford R.D.C.	H. J. Norris, Surveyor, Meonstons, Bishops' Waltham ..	do.
Purchase of Electrical Machinery and Plant	London C.C.	Council's Valuer, 9, Spring-gardens, S.W.	do.
A Tumbler Slop-cart	Warrington Heath Committee ..	Cleaning Superintendent, Central Sanitary Depot, Howley ..	do.
Boundary Wall & Gate Pillars, Holytown Cemetery ..	Bothwell Parish Council	R. W. Dron, Engineer, 65, West Regent-street, Glasgow ..	do.
Roads, Drains, etc., Holytown New Cemetery	do.	do.	do.
Extension of Car Pits at Tinsley	Sheffield Tramways Committee ..	C. F. Wike, City Surveyor, Town Hall, Sheffield ..	do.
Bridge, Bond-street, Strichley (in Ferro-concrete) ..	King's Norton, etc., U.D.C.	A. W. Cross, Engineer and Surveyor, 23, Vale-street, King's N.	do.
Granite-set Paving, Halifax & Wakefield Main Road	Liverpool U.D.C.	F. Langley, Engineer and Surveyor, Council Offices, Liverpool ..	June 5
Workpeople's Dining-room, Stansfeld Mills, Triangle	Bombay, Baroda, etc., Railway Co.	T. W. Wood, Gloucester House, Bishopsgate-st. Without, E.C. ..	do.
Rebuilding Front of Manse, Ballynahinch	Messrs. Morris & Sons, Ltd.	W. Clement Williams, Architect, 20, Southgate, Halifax ..	do.
Broken Whinstone, etc.	The Committee	J. A. Bothwell, C.E., 178, Ravenhill-road, Belfast ..	do.
Repairs to Midlothian rail Peebles Asylum, Roslynlee	Gosforth U.D.C.	G. Nelson, Surveyor, Council Offices, Gosforth, Northumberland ..	do.
Drainage Works at Walker East Council School	Newcastle-on-Tyne Educa. Com. ..	R. A. Smith, Clerk and Treasurer, 19, Heriot-road, Edinburgh ..	do.
Alterations to Classrooms, Golders-ct. Schs., Gildersome	Edinburgh Town Council	A. Goddard, Sec., Educa. Office, Northumberland-rd., Newcastle ..	do.
Asphalting yards, etc., Golders-ct. Schs., Gildersome	West. Riding C.C. Education Com. ..	Burch Engineers, City-chambers, Edinburgh ..	do.
Park Shelter, Victoria Park, Clayton, Bradford ..	do.	J. Vickers-Edwards, County Architect, County Hall, Wakefield ..	do.
Partick Electricity Works Extension	Partick Town Council	do.	do.
Oil and Engine-room Stores	do.	S. Spencer, Architect, Old Bank-chambers, Great Horton, Bradford ..	do.
Two Street Watering Vans	Broadstairs and St. Peter's U.D.C. ..	J. A. Robertson, Burgh Electrical Engineer, Hunter-pl., Greenock ..	do.
House, Stables, etc., Midway-avenue, Bridlington ..	Mr. J. Smith	H. Hurd, Town Surveyor, Broadstairs ..	do.
Agricultural Drain Pipes	Manchester Corporation	A. T. Martinale, Architect, Bridlington ..	June 7
Telephone System at Isolation Hospital, Singinghill	Wetherby R.D.C.	E. H. Coates, Clerk, Wetherby ..	do.
Paint. Work, Redfere, Com. Poorhouse, Crookston	do.	Macwhannel & Rogers, Architects, 55, West Regent-st., Glasgow ..	do.
Winding Pont-y-groes, Cwmgora	Glamorgan C.C.	T. M. Franklin, Clerk, Westgate-street, Cardiff ..	do.
Widening Olchfa Bridge, etc.	do.	do.	do.
Widening Sketty and Fafnwood Common Main Road ..	do.	do.	do.
Widening Cowbridge and Pont-y-hu Main Road	do.	do.	do.
Widening Bridgend, etc., Road at Aberkenfig	do.	do.	do.
Closets at Wern School, Ystalyfera	Glamorgan C.C. Education Com. ..	do.	do.
Alterations, etc., at Castell Coch School, Tonguevialls	do.	do.	do.
Class-room, Corychurch Council School	do.	do.	do.
Path, etc., Porth Intermediate School	Leeds Highways Department	City Engineer's Office, Municipal-buildings, Leeds ..	do.
Paving and Flagging Streets	do.	do.	do.
Flagging, etc., and Making Tar Macadam Roadways	West Ham Education Committee ..	W. Jacques, Architect, 2, Fen-court, E.C.	do.
Tar Paving Playgrounds of Three Schools	do.	do.	do.
Cleaning, Repair, and Painting of Schools	Warrington Health Committee ..	T. Longdin, Borough Surveyor, Warrington ..	do.
Painting, etc., Works	Trustees, Salisbury Mun. Charities ..	M. Harding, Surveyor, 68, High-street, Salisbury ..	do.
A 4-h.p. Vertical Steam Boiler at Workhouse	Hambledon Guardians	R. L. Lunn, Surveyor, 36, High-street, Guildford ..	do.
Additions to Glaston Council School, Swansea Valley	Glamorgan C.C. Education Com.	T. M. Franklin, Glamorgan County Offices, Westgate-st., Cardiff ..	do.
Exten. Playground, Plasnewydd Boys' School, Maesteg	do.	do.	do.
Removal, etc., Offices, Plasnewydd Boys' Sch., Maesteg	Portland U.D.C.	R. S. Henshaw, Engineer, Council Offices, New-road, Portland ..	do.
Repair of 12-in. Iron Pipe Sewage Outfall, Cheshilton	Glasgow Corporation	City-chambers, 61, Cochran-street, Glasgow ..	June 4
Sewerage Works, Sheldhall	County of Southampton	W. J. Taylor, County Surveyor, Winchester ..	do.
*Additions and Alterations to School	Main Roads and Bridges Committee ..	W. Tanner, F.S.I., County Surveyor, Newport, Mon.	do.
Altering, etc., Gradients & Widening Rds., Cymernau	Friendly and Trades' Societies ..	T. Kenahaw, Architect, L. and Y. Bank-chambers, Ealing ..	do.
Alterations to Oddfellows' Hall, St. James'-rd., Halifax	do.	H. Mansfield, Poor Law Officer, 3, Pocklington's-walk, Leicester ..	do.
Painting the David Lewis Hospital, Liverpool	Leicester Guardians	G. Harrison, Thurbury ..	do.
Supplies	Edinburgh Town Council	Burgh Engineer, City-chambers, Edinburgh ..	do.
Sewage Tank and 250 yds. Sewers, Newton Harcourt	Edinburgh Town Council	Water Superintendent, Anderson-street, Port Glasgow ..	do.
Sewer, West Merchiston and Gorgie District Drainage	Ogmore and Garw U.D.C.	F. E. Hughes, Town Hall, Manchester ..	do.
100 tons of Arran Sand	Committee, Wesleyan Reform Chapel ..	H. D. Williams, Surveyor to Council, Brynmam ..	do.
Road Works, Gworne Valley	Ruddersfield Corporation	C. R. Ross, Architect, York-chambers, Long Eaton ..	do.
Schoolroom, etc., Donisthorpe	West Riding C.C. Education Com. ..	K. P. Campbell, Borough Engineer, 1, Peel-street, Riddersfield ..	do.
Wood-Paving Blocks	Manchester Corporation	J. Vickers-Edwards, County Hall, Wakefield ..	June 9
Two Class-rooms, etc., Doncaster-rd. School, Mashro.	do.	C. Nickson, Town Hall, Manchester ..	do.
Stores (Gasworks)	do.	F. E. Hughes, Town Hall, Manchester ..	do.
Additions to Mill Barns, Malbon	Crown Agents for the Colonies	C. O. Dolg, Architect, Elgin ..	do.
Warehouse and Cask Shed, Malbon	do.	Office of the Crown Agents, Whitehall-gardens, S.W.	do.
9,425 tons of Steel Balls	Sir R. Harvey	Bourne & Son, Surveyors, Totnes ..	June 10
45,000 Fish-plates	Newcastle-on-Tyne Guardians ..	Newcombs & Newcombs, Architects, 89, Pilgrim-st., Newcastle ..	do.
Farm Building at Breckhill, near Totnes	West Riding C.C.	J. Vickers-Edwards, County Architect, County Hall, Wakefield ..	do.
Boiler House & Laundry, Westgate-road Workhouse	The Bryn Building Club	W. A. Griffiths, Architect, Pontillanfrith, Mon.	do.
Forcing Ho., Scalebar-pk. Asy., Burley-in-Wharfedale	Middlesbrough Corporation	W. Wilkins, F.S.I., Llanelly ..	do.
Sixteen Houses at The Bryn	Southampton C.C.	R. V. Thompson, jun., 42, Commercial-street, Middlesbrough ..	June 12
C.M. Chapel, Penygroes, near Llandabio	do.	M. Sellers, Engineer and Surveyor, Town Hall, Dundalk ..	do.
Schoolroom at Greshams	G.N.Ey. Co. (Ireland)	W. J. Taylor, County Surveyor, The Castle, Winchester ..	do.
Stores	Todmorden Health Committee ..	W. H. Mills, Engineer-in-chief, Amiens-street Terminus, Dublin ..	do.
Municipal Technical Schools, Dundalk	Acton U.D.C.	W. T. Taylor, County Surveyor, The Castle, Winchester ..	do.
Carting Materials for Repair of Main Rds., New Forest	Twickenham U.D.C.	Borough Surveyor's Drawing Office, Market-around, Todmorden ..	do.
Timber, etc., Station Buildings, Castlewellan	Wiltshire C.C. Bridge Committee ..	W. G. Hunt, Architect, 17A, Vicarage-gate, W.	do.
Steam-rollers for Main Road	Glasgow Corporation	S. Evans, County Surveyor, County Buildings, Mold ..	June 13
Sewerage Works, Halifax-road Sewer	Haverhill U.D.C.	J. Dalrymple, 46, Bath-street, Glasgow ..	do.
*New Public Offices and Town Hall	Cupar Town Council	E. W. Kneass, Engineer, Haverhill, Suffolk ..	do.
Trafalgar Schools, Third Cross-road	Oxford Guardians	H. Bence, Engineer, 67, Crossgate, Cupar, Fife ..	June 14
Painting Queensferry Bridge	Osselt Town Council	A. Ballard, 5 and 6, Magdalen-street, Oxford ..	do.
Tramway in Dalmanock-street, etc.	St. Asaph (Flint) R.D.C.	W. Emmott, Engineer, 35, Commercial-street, Halifax ..	do.
Road Macadam	Lindsey C.C. Education Committee ..	T. B. Farrington, Engineer, Trinity-square, Llandudno ..	do.
Sewage Disposal Works	Women's Institute	C. E. Hutton, District Clerk, Northleach ..	do.
Electricity Works	Grangemonth Town Council	A. Ellis, Borough Electrical Engineer, The Hayes, Cardiff ..	do.
Add. to Infirmary Bldgs., Cowley Poor Law School	Warrimster Fire Brigade	H. H. Nankivill, Surveyor, Ventry Hall, Brantree ..	June 16
School for 934 Children, Galsborough	Northall U.D.C.	A. J. Cameron, Architect, 53, St. King-street, Edinburgh ..	do.
Swimming Bath, etc., at Liverpool	Cardiff Asylum Committee	H. Shaw, Engineer, Town Hall, Lifford ..	June 18
Storage Reservoir near North Third, St. Ninians	Brantree U.D.C.	J. Cheyne, The Ley, Lymann, and J. Guster, F.S.I., Glasgow ..	do.
Fire-station, Close-road	The Trustees	F. E. Priest, Engineer, 15, Harrington-street, Liverpool ..	do.
Granite, Cement, Fillets, etc.	Edinburgh Town Council	do.	do.
Electric Lighting, Whitechurch Asylum	Mr. E. A. Christy	do.	do.
Making-up Victoria-street, Brantree	Wirral R.D.C.	do.	do.
Erection of Almshouses, Farnham	do.	do.	do.
Hot-water Heating Instal., Council Offices, Castle-ter.	do.	do.	do.
Dust Destructor	do.	do.	do.
Pair of Cottages at Llanged	do.	do.	do.
Sewers at Moreton, Bidston, and Upton	do.	do.	do.

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Advertised.	Form of Tender, etc., supplied by	Tenders to be Delivered
Macclesfield Gas Committee	Mr. Newbigging, Engineer, Gas Works, Macclesfield	do.	June 17
do.	do.	do.	do.
do.	do.	do.	do.
Ruislip-Northwood U.D.C.	W. Louis Carr, Surveyor, Council Offices, Northwood, Middlesex	do.	do.
Leish Corporation	T. Hunter, Borough Engineer, Council Offices, Northwood, Middlesex	do.	do.
Woodhall Spa U.D.C.	E. E. T. Bolton, Surveyor, Council Offices, Woodhall Spa	do.	do.
Romford R.D.C.	G. Lapwood, Highway Surveyor, Victoria-road, Romford	do.	June 19
Rumby & Fordingham U.D.C.	A. Atkinson, C.E. Briggs	do.	do.
Pontypridd U.D.C.	P. R. A. Willoughby, Eng. and Sur., Council Offices, Pontypridd	do.	do.
do.	do.	do.	do.
do.	do.	do.	do.
Finchley U.D.C.	Engineer, Council Offices, Church End, Finchley, N.	do.	do.
Cromer U.D.C.	Council's Surveyor, West-street, Cromer	do.	do.
West Ham Education Committee ..	W. Jacques, Architect, 2, Fen-court, E.C.	do.	do.
do.	do.	do.	do.
Trustees	Morgan & Elford, Architects, 1, Jeffrey-street, Mountain Ash	do.	do.
West Ham Borough Council	Borough Engineer, Town Hall, West Ham, E.	do.	do.
Surrey Education Committee	Jarvis & Richards, Architects, 36, Victoria-street, S.W.	do.	June 20
Chelsea Guardians	The Clerk, 250, King's-road, Chelsea	do.	do.
Hull Education Committee	J. T. Riley, Sec., Education Offices, Albion-street, Hull	do.	June 21
do.	do.	do.	do.
Metropolitan Water Board	District Secretary, 172, Rosebery-avenue, E.C.	do.	June 22
Nottingham Water Committee	F. W. Davies, Water Engineer, St. Peter's Church-ward, Nottingham	do.	June 24
Edinburgh and Leith Gas Commis..	W. R. Herring, Engineer, New-street Works, Edinburgh	do.	June 25
Feltham U.D.C.	R. E. Stewart, Surveyor, Town Hall-chambers, Feltham	do.	do.
Pop. & Rep. Sk. Asy. Dist. Managers	J. & W. Clarkson, 180, High-street, Poplar, E.	do.	June 27
Tipton U.D.C. Education Committee ..	A. Long, Architect, 21, New-street, West Bromwich	do.	July 3
Manchester Education Committee ..	C. H. Wyatt, Education Offices, Deansgate, Manchester	do.	do.
Durham Co. Education Authority ..	W. Rushworth, Architect, Education Offices, Durham	do.	No date.
do.	"Fairholme," Fairmile, Cobham, Surrey	do.	do.
Mr. Ezra Hillingworth	Richards, Builder, Hawksworth Estate, Vespers-road, Epsom	do.	do.
The Committee	P. Fox, Architect, Manchester-road, Bradford	do.	do.
do.	S. W. Grant, Architect, 63, Finsbury-pavement, E.C.	do.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
Derbyshire Education Committee ..	120L	do.	June 13
Northern Polytechnic Institute ..	125L per annum	do.	June 19
do.	150L per annum	do.	do.
Admiralty	Not stated	do.	June 23

Those marked with an (*) are advertised in this number.

Competitions. —

Contracts, iv. vi. viii. x.

Public Appointments, xviii.

TENDERS.—Continued from page 611.

CRICK.—For the reconstruction of gasworks, Gas Committee. Mr. J. McDougal, gas engineer, Hamilton. Quantities by Messrs. D. Wilkie & Co., Glasgow. Work tendered on a schedule of prices.

MISS MENDEN (Bucks).—For two houses for Mr. Bruce Merson, architect, Kilburn, N.W. Right, £2,175 0 0 Aldridge & Son* £2,115 0 0 Left, £2,149 0 0 M. Dymock, 1,951 15 0

LEWIS.—For erecting a house and shop in the street for Mr. C. H. Ives. Mr. A. Pellis, architect. Right, £1,335 Howard Bros. Left, £1,200 Haleworth, £1,060 Accepted subject to slight alteration.

WYNN.—For the erection of farm buildings at the village and the Epiphany Colony, for the County Council. Messrs. Enness, Bros. £3,828 Mr. W. Potter, 66, North-street, Horsham*, 3,700

WYNN.—For the erection of farm buildings at the village, for the London County Council. Messrs. Sutherland & Co. £2,407 Mr. W. Potter, Horsham*, 2,007

WYNN.—For building a detached house in Elgwood Lane, for Mr. E. T. Sheneld. Messrs. Overton, architects, Warnham House, 22, Ship-street, Chichester. Right, £2,880 0 0 A. Chilton, £753 0 0 Left, £2,828 0 0 G. P. Kerridge, Brighton*, 750 0 0

WYNN.—For erecting an elementary school children, for the Education Committee. Quantities by Mr. C. Huntingdon. £5,000 (Right eight tenders.)

WYNN.—For private street works, for the Urban Council. Mr. W. Dawson, Surveyor to Council, Llandudno. Right, £3,550 15 0 C. J. Anderson, 3,058 15 0 Left, £3,998 7 6 J. Jackson, Pilsnig*, 8,043 12 1

LEYTON.—For erecting a branch library, Lea Bridge-road, E., for the Urban District Council. Mr. W. Jacques, architect, 2, Fen-court, Fenchurch-street, E.C. 4. 4,595 0 0 Sims & Woods, 23,907 0 0 Wollaston & Co. 4,575 0 0 W. H. Hyde, 3,871 0 0 Ferguson & Co. 4,272 0 0 Groves & Sons, 3,819 0 0 S. E. Moss & Co. 4,250 0 0 S. and S. 4,200 0 0 W. Harris, 4,200 0 0 W. J. Maddison, 3,998 0 0 Parsons, 3,989 0 0 H. C. Horwell, 3,960 0 0 J. T. Robey, 4,159 0 0 B. E. Nightingale, 3,917 0 0 F. W. Harris & Co., Ltd. 4,148 0 0 F. J. Coxhead, 3,916 0 0 C. N. Math, 4,076 0 0 A. E. Symes, 3,969 0 0 W. Manders, 3,949 10 4 Oak Building Co. 4,057 0 0 A. G. Crisp, Kirk & Randall, 3,945 0 0 Waltham Shawmur & Sons, 3,933 0 0

LICHFIELD.—For the construction of about 400 yds. 15-in. 780 yds. of 12-in., 2,300 yds. of 6-in., and 2,810 yds. of 8-in. stoneware pipe sewers at Chaseton, together with the necessary manholes, lamp-holes, etc., also for the construction of an open septic tank and the laying-out of about 44 acres of land in the same village, for the Rural District Council. Mr. F. L. Tomkys, Engineer, Chesterfield, near Lichfield. L. & E. £4,940 2 4 Barton, 29,980 0 0 W. D. Oakley, 4,802 12 10 Parkin & Co. 6,570 0 0 J. & J. 4,883 0 0 W. E. B. East, 4,250 0 0 Warner, 4,700 0 0 E. Blewit, 4,670 0 0 Thorpe, 6,040 2 4 G. Holloway, 4,855 4 10 A. J. Cottie, 5,778 10 0 H. E. Buckley, 4,752 6 0 E. Moore, 5,959 19 11 Barker Bros. 4,299 0 0 T. Egan & Sons, 5,873 8 8 Lowe & Sons, J. Atkins, 6,259 4 8 Burton-on-W. Heaps, 5,268 0 0 Trent*, 4,100 0 0 C. J. Nevitt, 5,194 9 8

LIVERPOOL.—For North Homeopathic Dispensary, Roscommon-street, Liverpool. Mr. F. U. Holme, architect, Liverpool. Jones & Sons, £2,500 H. E. B. Greene, £1,935 Wearing & Son, 2,010 Hughes & Stirling, 1,865 Holme & Green, 1,854 W. Hall & Son, 1,798 S. Webster, 1,945 J. & E. Rimmer, 1,760

LONDON.—For erecting stores, offices, etc., on the site of Nos. 47 to 51, Hatfield-street, Southwark, S.E. Mr. A. Conder, architect, Palace-chambers, Westminster. Trollope & Colls, Ltd. £9,455 H. Lawrence & Son, £9,025 Ltd. 29,545 Biggs & Hill, Ltd. 8,994 T. Rider & Son, 9,456 W. Cubitt & Co. 8,991 McCormick & Son, 9,409 H. Young, 8,973 L. H. & R. Roberts, 9,369 Holland & Hannan, 8,875 J. Mowlem & Co. 9,163 J. Grover & Son*, 8,663

LONDON BOARD OF EDUCATION TENDERS. Holborn, Drury-lane Day Industrial School (Cleaning Interior).

G. Foxley, £340 0 J. R. Sims, £228 0 J. Appleby & Sons, 298 0 T. L. Green, 57, Barrett & Power, 295 10 59, and 60, Holloway Bros. 286 0 Holborn*, 197 0 W. Hornett, 260 0

Finsbury, C., "Hugh Myddelton" School (Playsheds). W. Irwin, £75 G. S. S. Williams & Son, £70 T. L. Green, 75 General Builders, Ltd. 73 Staines & Son, 61, Stevens Bros. 72 Gt. Eastern-street*, 66

Barnes, R., "Barnes" School (Playsheds). R. Hies, Ltd. £220 8 J. J. Reslaud, 255 0 0 Rice & Son, 87 0 0 Sons, 48 0 0 Maxwell Bros. 61 0 0 H. Line, 51, Peckham-rye*, 45 0 0 L. Whitehead & Co., Ltd. 57 0 0

LONDON.—For the construction of the foundations for the road between the river wharf and the engine-house, and the foundations of any other paving works necessary in connection with the Greenwich electricity generating station. Messrs. H. Lovatt, Ltd., at the same schedule rates as those provided for in their present contract for the erection of the superstructure of the station portion of the generating station; the remainder of the paving works and track-work in connection with the generating station to be executed by the staff of the tramways department under the supervision of the chief officer of tramways.

LONDON.—For alterations and additions at the Custom House Hotel, Custom House, E., for Mr. H. Elliston. Mr. J. M. H. Gladwell, architect, Essex House, High-street, Stratford, E. Quantities by Mr. L. E. G. Collins, 31, St. Helena, E.C. Newmans & Todd, £7,800 Sheffield Bros. £3,795 Harris & Wardrop, 7,200 Hibbard Bros. 6,781 Pringle, 7,050 W. J. Madison, 6,595 Harper, 6,853

LONDON.—For iron fencing, gates, etc., at the playground, Morton-road, and at St. Mary's Church-gate, Upper-street, Islington, for Islington Borough Council. Mr. J. P. Barber, Surveyor, Town Hall, Upper-street, N. Hewitt Bros. £365 14 6 The Dudley Howard Bros. 228 10 9 Art Metal Co., Ltd. £187 18 3 Lockyer & Wilson, Ltd. 223 15 0 E. J. Raybould & Co., Ltd. 180 10 0 W. Gratix & Sons, 212 9 6 T. W. Palmer & Co. 179 12 6 Bayliss, Jones, & Bayliss, Ltd. 193 13 3 M. McVey, Kennington-road, S.E.*, 163 16 7

LONDON.—For erecting a disinfecting station, for the Royal Borough of Kensington. Mr. W. Weaver, Borough Engineer and Surveyor, Town Hall, Kensington, High-street.—

	Price, if with Glazed Bricks	Price, if with Red Pressed Bricks
Cunningham, Forbes, & Co.	£7,181 15 6	£7,777 19 2
J. Barker & Co., Ltd.	6,002 0 0	5,566 0 0
R. Haynes	5,985 1 9	5,514 7 4
J. Wright	5,450 10 0	5,000 0 0
Palman & Fotheringham, Ltd.	5,223 0 0	4,773 0 0
W. King & Son	5,135 0 0	4,863 0 0
W. Wallis	5,105 0 0	4,802 0 0
Higgs & Hill, Ltd.	4,904 0 0	4,594 0 0
F. Webster	4,393 13 8	4,698 7 0
Matlock & Parsons	4,392 0 0	4,688 0 0
Kirk & Randall	4,387 0 0	4,627 0 0
J. Mowlem & Co., Ltd.	4,980 0 0	4,640 0 0
R. Dean & Co.	4,900 0 0	4,526 0 0
L. R. Lamplough	4,872 0 0	4,449 0 0
C. Darling & Son	4,822 15 1	4,545 5 6
Martin, Wells, & Co.	4,865 0 0	4,550 0 0
T. Bendon	4,775 0 0	4,445 0 0
W. Lawrence & Son	4,773 0 0	4,354 0 0
A. Hudson & Co.	4,727 0 0	4,450 0 0

MILTON-NEXT-SITTINGBOURNE.—For 1,800 ft. lineal of Norwegian kerb, for the Urban District Council. Mr. W. B. Warlow, Surveyor, Town Hall, Milton.—

A. F. Manuels, 57, Gracechurch-street, E.C.—Flat kerb, 12 in. by 6 in., 10d.; edge kerb, 6 in. by 12 in., 10d.; channel, 12 in. by 6 in., 9d.; quadrants, 7s. 6d.

MOUNTMELLICK.—For waterworks extension, for the Rural District Council. Mr. F. Bergin, engineer, 30, Westmoreland-street, Dublin:—
J. Graham... £1,695 0 0 J. Kelly, Kilkeny... £1,468 11 3
P. Blake... 1,482 5 0

NOTTINGHAM.—For stabling, Popham-street. Mr. H. Alcock, architect:—
P. Messom... £135 14 Richardson & Co. £128 0 0
W. Crane & Co. 134 17 Hewerdine... 127 0 0
J. Wright... 133 0 H. W. Lee... 127 0 0
G. Kerry... 130 0 W. Inger... 125 10 0
J. G. Short... 129 10 A. B. Clarke... 120 0 0
J. & H. Vickers... 129 0

NOTTINGHAM.—For erecting a building for the Nottingham Butchers' Products and Casing Co., Ltd. Mr. H. Alcock, architect:—
T. Whitaker... £849 0 0 F. Messom... £588 0 0
W. Crane & Co. 825 0 0 F. Booth... 587 14 0
W. Inger... 616 16 0 J. Hutchinson... 585 0 0
Dennett & Logie 612 0 0 T. Fish & Son... 582 0 0
J. Wright... 605 0 0 A. B. Clarke... 575 0 0
H. Vickers... 595 0 0 G. M. Kerry... 556 11 1
J. G. Short... 595 0 0 J. H. Vickers... 520 0 0

NOTTINGHAM.—For the erection of four houses, Colwick-road and Meadow-lane. Mr. H. Alcock, architect:—
P. Messom... £1,825 W. & J. Simons... £1,655
H. Vickers & Son... 1,793 G. Sadler... 1,650
T. Whitaker... 1,750 G. Lovell... 1,650
J. Wright... 1,725 Richardson & Co. 1,650
A. B. Clarke... 1,720 Hewerdine... 1,629
F. Booth... 1,714 Fish & Son... 1,615
J. G. Short... 1,697 Crane & Co. 1,598
G. A. Pillatt... 1,651 J. Wright... 1,598
T. Barlow... 1,660

NOTTINGHAM.—For the erection of four houses, Meadow-lane. Mr. H. Alcock, architect, Nottingham:—
T. Fish & Son... £1,186 6

REIGATE.—For constructing a new arch at Pym's siding and other works in Wray Common-road, for the Council. Mr. Fred T. Clayton, Borough Surveyor. Quantities by Surveyor:—
Hewett & Sons C. Nightingale
(Barking), Ltd. £1,292 2 8 & Sons... £1,088 0 0
Saunders Juel 1,110 0 0 E. Worsell
G. S. Faulkner 1,173 1 7 Redhill... 1,040 0 0
J. J. Pink... 1,139 0 0

ROYDON.—For the erection of an eight-roomed house near Roydon, Essex, for Mr. C. F. Steel. Messrs. Barrett & Driver, architects and surveyors, 23, York-place, Baker-street, London, W.:—
C. S. Foster & A. M. Byott... £387 7
Son... £420 0 S. Charter... 310 0
R. Archer... 395 0 W. E. Clarke,
C. King... 360 0 Hodgeson... 298 10

SELBY.—For constructing a road at the new waterworks at Brayton Bar, for the Urban District Council. Mr. P. Griffith, Engineer, 54, Parliament-street, Westminster, S.W. Quantities by Mr. Bruce McGregor Gray, Engineer, Selby:—
W. Keighley... £605 12 0 J. Wood... £510 0 0
J. T. & C. Lister 570 0 0 J. Ellis... 459 2 5
J. Brunton... 541 2 2 T. Bell... 420 10 5
J. Spright... 539 7 0 A. Dickinson... 379 12 11
Parker, Sharpe, & Co. 531 4 0 Sen... 320 0 0
B. Graham & Smith Bros... 303 8 3
Sons... 514 10 0 Selby... 303 8 3

SOUTHAMPTON.—For converting Nos. 102, 104, 106, and 108, Above Bar into business premises, for Messrs. Smith, Bradbeer, & Co., Ltd. Mr. W. Burrough Hill, architect and surveyor, Southampton:—
J. J. Udall & Plavfair & Toole £2,727 0
Co. £23,305 16 H. Stevens & Co. 2,544 0
Dyer & Sons... 3,070 0 A. Wright & Son 2,495 0
D. Drake... 2,875 0 H. Cawley, South-
Jenkins & Sons 2,764 0 ampton... 2,431 0

SOUTHAMPTON.—For converting 100, Above Bar into business premises, for Mr. William Dale. Mr. W. Burrough Hill, architect and surveyor, Southampton:—
H. Stevens & Co., Southampton... £354

SOUTHAMPTON.—For converting 98, Above Bar into business premises. Mr. W. Burrough Hill, architect and surveyor, Southampton:—
H. Stevens & Co., Southampton... £400

TIPPERARY.—For building six houses on the estate of the Right Hon. Lord Barrinmore. Messrs. W. H. Hill & Son, architects, 28, South Mall, Cork:—
M. Kirby, Tipperary, Ireland... £1,725

WEST BOLDON.—For alterations and additions to the National Schools. Mr. J. Spain, architect, 12, John-street, Sunderland. Quantities by architect:—
O. Lavin... £670 11 0 J. Armitage... £487 0 0
Walker Bros. 627 7 10 M. Hall, jun... 495 0 0
W. J. Robert-son & Sons 530 0 0 J. Musgrave... 485 7 0
J. H. Scott... 525 7 4 Swales & Ridley 479 0 7
J. Young... 519 0 0 J. W. White... 472 15 6
G. P. Gildespy 510 15 0 J. Eirick... 470 10 0
J. Johnson & Sons, Ltd. 508 18 8 J. W. Tiffin,
J. Davidson... 506 14 7 Sunderland... 459 0 0
J. Brovell... 498 0 0

CORRECTION.—In reference to the list of tenders published last week for disinfecting-station for the Kensington Borough Council, the name "F. Wolsell" should have been F. Webster (Fenwick-road, Peckham Rye).

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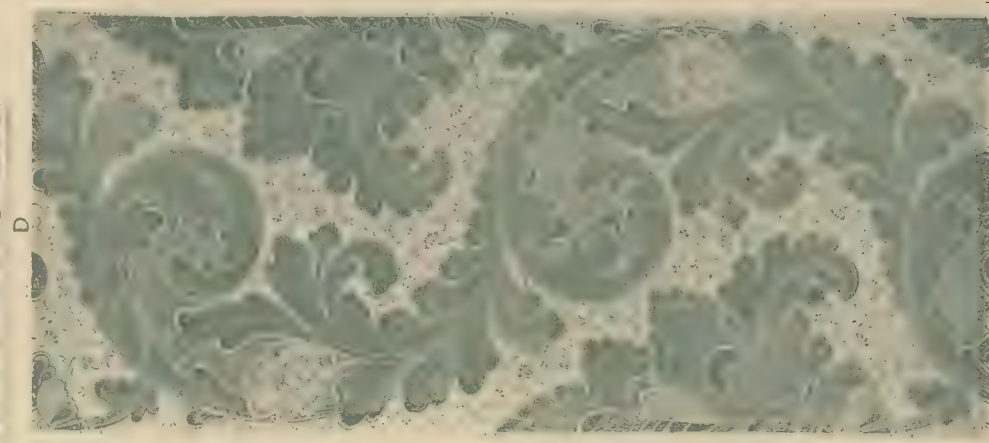
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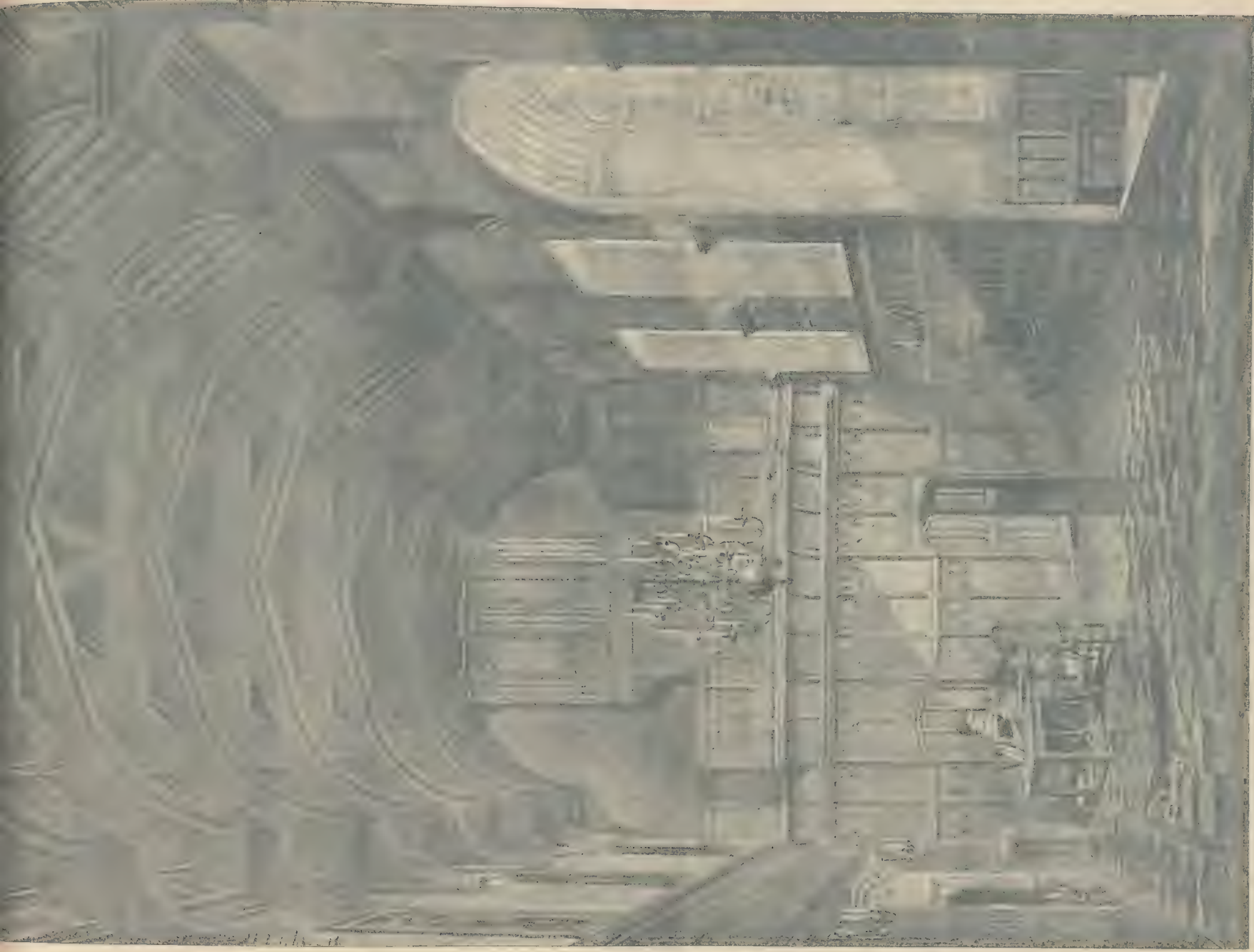
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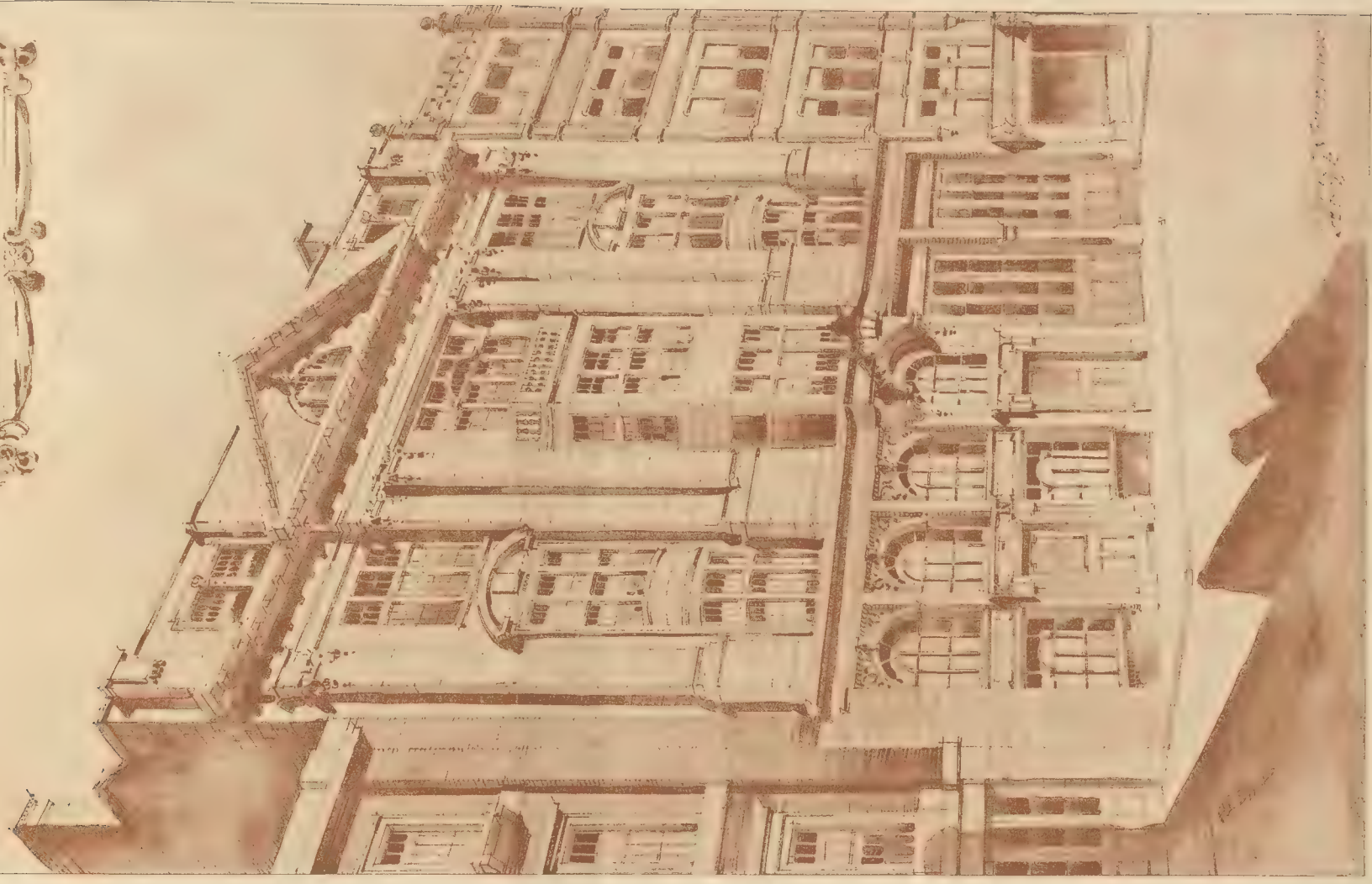
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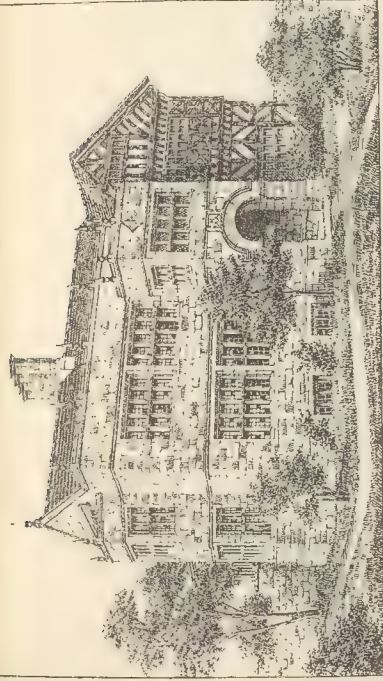


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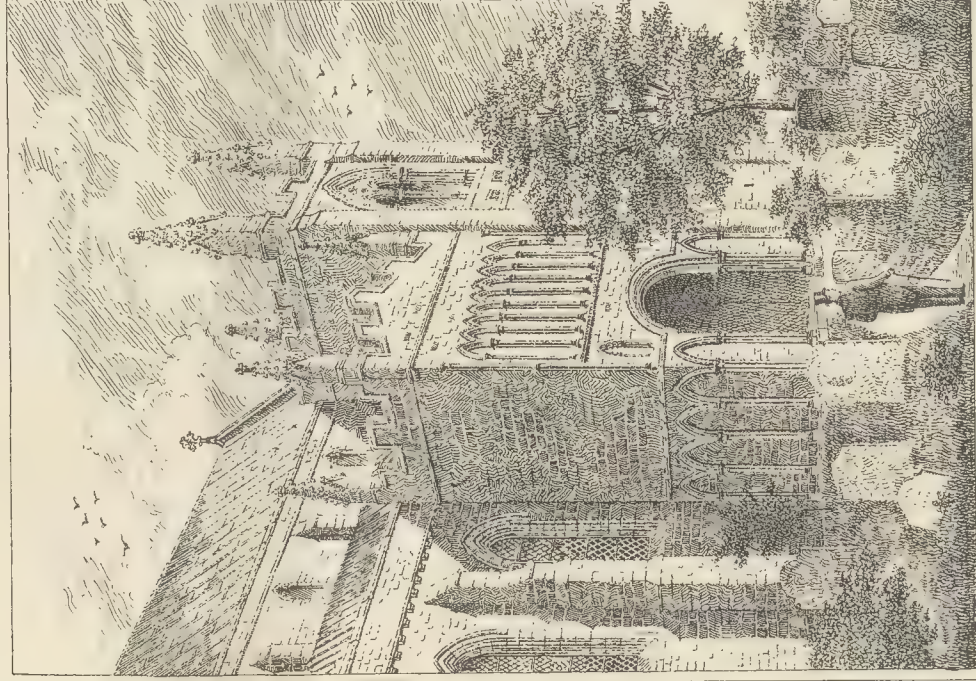
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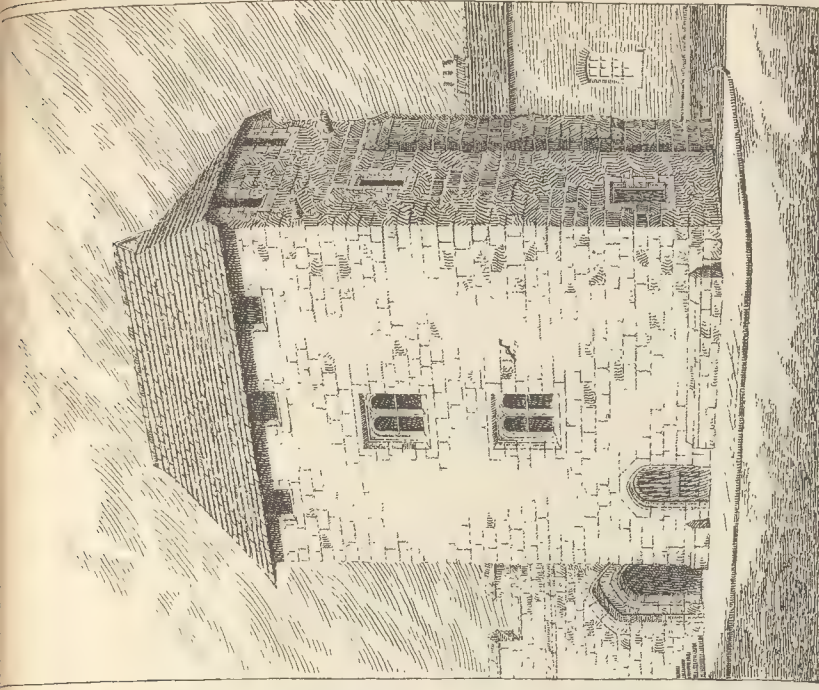


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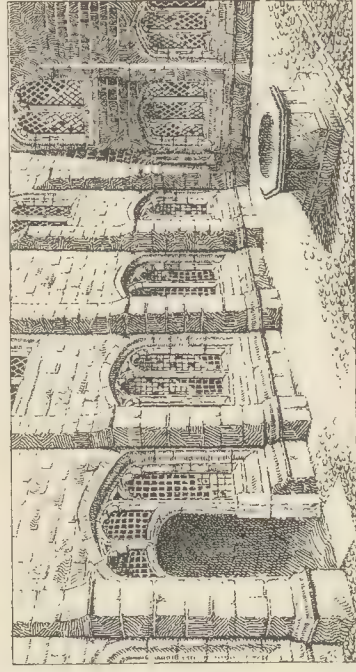
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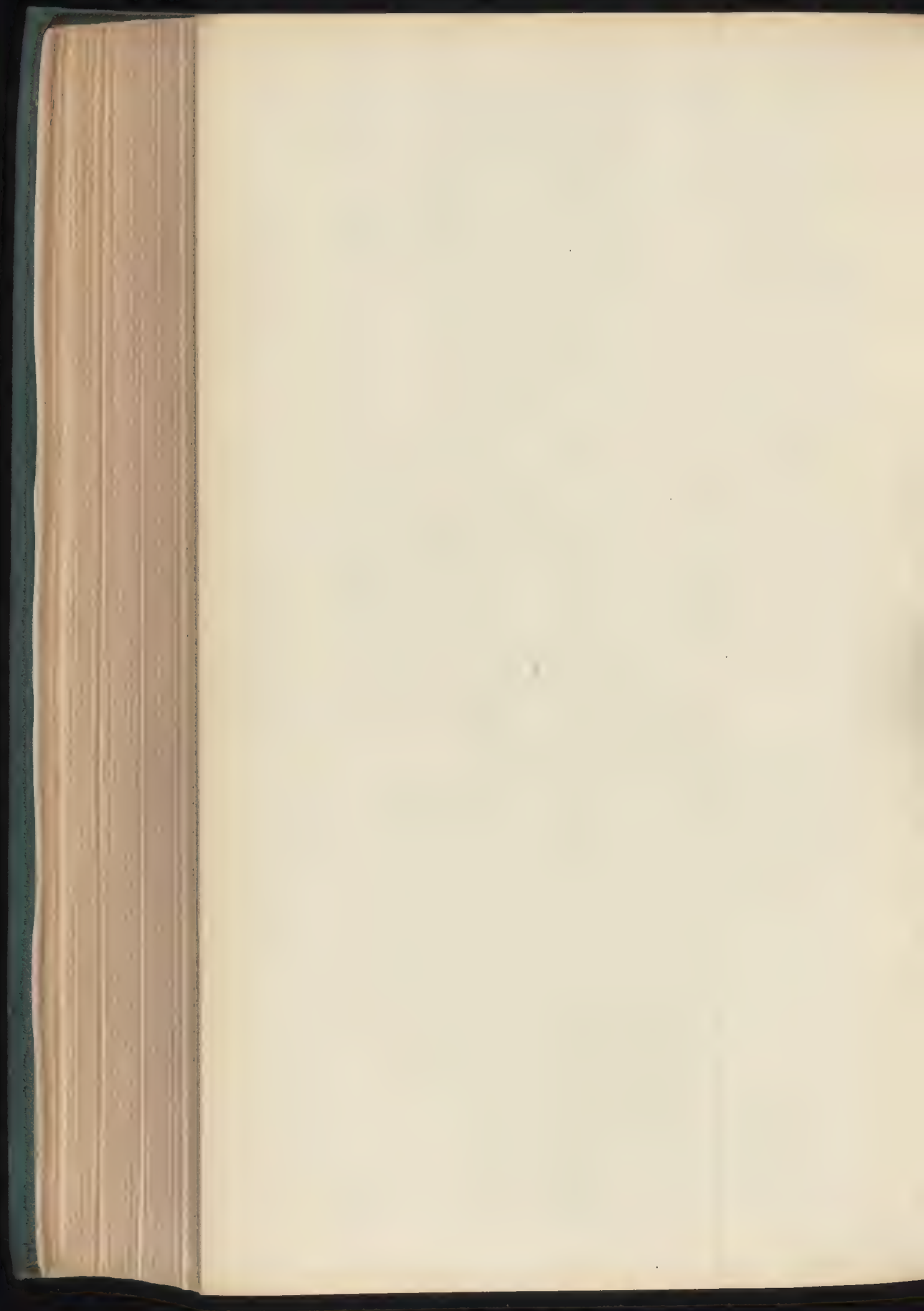
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VOL. LXXXVIII.—No. 3253.

JUNE 10, 1905.

Army Medical Corps Memorial (South African), Aldershot.....	{ Mr. R. Weir Schultz, Architect.
Tullylagan, Co. Tyrone.....	{ Mr. W. Goscombe John, A.R.A., Sculptor.
House at Denbigh.....	Messrs. Hart & Waterhouse, Architects.
Church of St. Chad, Longdon.....	Mr. E. Guy Dawber, F.R.I.B.A.
Illustrations of Lostwithiel Church, Cornwall.....	Mr. Gerald C. Horsley, Architect.
	From Photographs.

Notes and Sketches in Southern Italy.—XI. :—

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THE ancient town of Lostwithiel, Cornwall, is pleasantly situated at the head of the picturesque estuary of the Fowey. Its situation accords with that usually met with in such localities, namely, at the mouth of a river, by which vessels or boats could be carried by the tide from the old borough of Restonnel Castle. It has not much to boast of, but it has the Church of St. Andrew, with its noble spire.

Robert de Cardinham was lord of Lostwithiel temp. Richard I., and the town owed to him much of its former importance. He obtained the privilege from the Crown of establishing a weekly market, paying ten marks for the licence. He also granted a charter to the town about the year 1196, confirming the burgesses and men of Lostwithiel in all honours, liberties and quittances, and establishing new ones. Among the ordinances of this charter is one prohibiting a stranger out of a ship keeping shop in the town, save by permission of the provost and community, thereby proving the considerable foreign trade that was even then done in this town and district.

About 1219 Andrew de Cardinham gave the town and the advowson of the church to the Priory of Tywardreth. This Benedictine priory lay about 3½

miles south-west of Lostwithiel; it was itself only an alien priory, being a cell of the Abbey of St. Sergius and St. Bacchus, in Normandy. Most of the churches immediately around were appropriated to this priory. The priors were appointed direct by the mother-house, and were almost invariably foreigners (together with the majority of the monks), up to the time of the suppression of the alien houses at the beginning of the XVth century, and hence there was considerable foreign influence in the town and district. When most of the alien priories were suppressed, Tywardreth had sufficient influence to obtain a charter of denization. The vicar of Lostwithiel in the old days could have had comparatively little influence as compared with the prior of Tywardreth, for, although appointed for life on the prior's presentation, the vicarage was about the most poorly endowed in all Cornwall. Not only did all the big tithes go to the priory, but the vicar himself had to pay a pension of 20s. to the priory, and when that was paid his own assured income was only 2*l.* 13*s.* 4*d.*

It will be presently seen that these brief historical statements are of interest as pertaining to the architecture of the church. There is also one other recorded incident in the past history of Lostwithiel that has an important bearing on the story of the fabric and its present condition. In the summer of 1644 this town was made the headquarters of the Earl of Essex's Parliamentary forces, who had recently defeated the Royalists in a battle near the borough. In

Dugdale's "Short View of the Late Troubles in England" (1681) occurs in this passage, under date August, 1644:—"At Lestithiell in Cornwall, when the Earl of Essex was there with his Army, one of the Souldiers brought a Horse into the Church, led him up to the Font; and made another hold him, whilst he Sprinkled water on his Head, and said 'I signe thee with the signe of the Cross in token thou shalt not be ashamed to fight against the Round Heads at London,' with a deal more of such Blasphemous stuff; blowing up that Church with Gunpowder at their departure." We get further particulars both of the sacrilege at the font, and of the damage done to the church by gunpowder, from the diary of Richard Symonds, a lieutenant in the King's forces, who went through the whole of the Cornish campaign of 1644.

The church of St. Bartholomew, situated in the centre of the town, consists of quasi-chancel, clearstoried nave of five bays, north and south aisles, north and south porches, with western tower and spire. The whole ground plan of the church, exclusive of the tower, has an interior measurement of about 75 ft., whilst the width (including the aisles which are continued flush with the chancel) is 48 ft.

It is not known when a church was first built at Lostwithiel, but probably not until Norman days. In the charter of Robert de Cardinham, at the end of the XIIth century, he refers to the privileges of the inhabitants which "his ancestors gave them of old on the day when they

founded the town." There can be no manner of doubt that the town had a church during the Norman period, which was probably one of some magnitude; but nothing now remains of such a structure. In the south wall of the church, in the most western bay, between the porch and the tower are two plain exterior sepulchral recesses. They have never contained effigies within memory, but a steady tradition has been maintained that here were buried Robert de Cardinham and his wife. During the alteration of 1890 human bones were found beneath the slabs in each recess, but no trace of any kind of coffin. It is by no means impossible that tradition is right, and that these recesses were originally constructed for the great lord of the town and his lady, when the church (then a rectory in their own control) was proposed to be rebuilt in the new English style then coming into vogue, at their expense. Robert de Cardinham (or Cardinan) was by far the largest landowner in the county, and his lady was the wealthy heiress of FitzWilliam. We may be quite certain that these recesses are over the graves of persons of importance and locally respected, for it is obvious that they are of earlier date than the walling around them, and were carefully preserved when a later church was built.

The only part of the church that can be now assigned to the Early English period is the tower, which was originally a plain but well-built structure early in that period of two stages, and apparently crowned with a low, broached spire. On the west side there are three low buttresses that reach up about two-thirds of the height of the first stage. Probably these are all of later work than the tower itself; at all events, this is the case with the centre one of the three, for there are indications of the head of a blocked-up window above it. There are lancet lights in the first and second stages of the north and south walls of the tower, and in the upper stage of the west wall. The angles of the low broached spire rising from an elementary third stage can be detected on close examination both on the west and south sides.

A remarkable feature of this tower—which fully accounts for its somewhat exceptional shape and construction—is that it was built over a right of way. There was a public footpath that passed beneath this tower, through north and south open doorways, until the restoration of 1878-9, when the way was closed and doors supplied to these two tower doorways. This tends to prove that the *circa* 1200 church was an extension to the west of its Norman predecessor. The evil result of such an arrangement as this, so far as the dignity or beauty of the interior of the body of the church is concerned, was that there could be no archway from the tower into the nave. There is merely a somewhat mean-looking doorway at the west end, with a square light into the ringing-chamber above it.

On the west front of the tower there are the weather mouldings of the acutely-pitched Early English roof still discernible above the present roof of the nave.

Fairly early in the XIVth century came about the enrichment of this church by the addition of an exceptionally

beautiful spire, which the late Mr. Street termed "the pre-eminent glory" of the West of England. It required, too, consummate skill to add such a work to an earlier tower. An octagonal lantern was built up around the base of the old broached termination to the tower; each of the eight sides is pierced by gabled coupled lights, having a quatrefoil in the apex and crossed in the centre by a transomed panel of four open quatrefoils—save that in the north-east light a circle of six trefoils forming a wheel takes the place of the four quatrefoils. The whole effect of this singular arrangement is surprisingly light and graceful. The octagonal spire that rises from amidst this lantern to a height of about 110 ft. has four dormered lights on the cardinal faces. The actual spire seems scarcely worthy in its finish and proportions of the noble lantern, and it has probably often been, perforce, repaired in the six centuries of its life. It is known that it was struck by lightning in 1757, and on that occasion it is supposed to have been restored to only a portion of its original height. In 1876 it suffered from a violent gale; and in 1883 it was repaired and raised to its present height, which is still considered to be somewhat less than its original proportions.

Somewhat later in the XIVth century than the construction of this lantern and spire, the work of completely rebuilding the church, such as it now stands, was taken in hand. The nave and continuous chancel are divided from the aisles by arcades of five arches on each side. The piers have no capitals, the mouldings being carried up continuously into the arches. Such an arrangement, common enough in the north of France, is decidedly uncommon in England. The whole effect of these arcades is distinctly foreign; they closely resemble the arcades of like date at the fine church of Fowey at the mouth of the estuary. Mr. Street had no doubt that the idea, if not the actual workmanship, came from across the seas; and Mr. Street had made no study of the history of the place. Had he done so he would at once have seen the reasonableness of such a notion, for the prior of the alien priory of Tywardreth, himself a foreigner, would have the chief say, as rector and townsman, in this general scheme of rebuilding. Moreover, the stonework of the arcading is almost certainly from Normandy; and it would be probably almost as cheap, if not cheaper, to bring this freestone across the seas and up the Fowey than to use English freestone carried overland by bad roads from Bath or from places yet more remote.

The westernmost arches of these arcades are rather lower, and in other respects slightly different from the remainder. Possibly this denotes the beginning and interruption of a plan at the same time as the spire, which was taken up and completed on somewhat different lines later in the century. Can it be that this is one of the several instances wherein church building was for a time checked by the ravages of the Black Death of 1348-9?

The clearstory windows over the lean-to aisles—irrespective of clearstories

being of highly exceptional occurrence in Cornwall—are most unusual. There are only four on each side, and they consist of three grouped lancet lights, the centre light somewhat the highest. They are of the plainest construction, and, without the gunpowder incident detailed by Symonds and Dugdale, would have been difficult to explain. But, an explosion strong enough to lift the roof would be certain not only to blow the glass out of all the windows, but to materially damage the walls on which the roof rested. There can be no doubt whatever that the walls above the arcades would require much reconstruction after the explosion of 1644. Possibly there would be mere patching up until after the restoration of monarchy and episcopacy in 1660. The somewhat plain square-headed windows of the side walls of the aisles are not original; a good deal of the work is of last century restoration. One noble feature of the church was spared, so far as the XIVth century mullions and tracery (though somewhat repaired) are concerned, when the gunpowder wrought such havoc. The great east window of the chancel of five lights is unusually large, measuring 34 ft. high by 14 ft. wide. The tracery is a remarkably good example of the later geometrical style. Above each light is a trefoil, and above these five trefoils are rows of four, three and two quatrefoils respectively, with a single quatrefoil in the apex. It may be remarked that this window was filled with stained glass (Clayton & Bell) in 1886, which is exceptionally good for that date.

The large XIVth-century octagonal font of Pentewan stone has a diameter of 33 in., and stands 47 in. high. The bold carvings on the different faces are not a little remarkable. Facing east is the rood with Saints Mary and John. Next comes, in bold relief, a huntsman on horseback, with horn held to his lips by his right hand, and falcon on his left hand; a hound precedes the horse. The north face has two lions passant. Projecting 6 in. from the next face is a grotesque human head, with two interlaced snakes dependant from the crown, the head of each snake being just over each ear. The west face has a tracery pattern of quatrefoils: The next panel has the figures in relief of two quadrupeds; one, perhaps a hound, seizing the other (? a wolf) by the hindquarters; a figure above these is much mutilated, but is possibly a second hound. The south face is also tracery work, chiefly quatrefoils: The eighth face represents a mitred head, which projects 4 in.; from the ears and corners of the mouth proceeds foliage. The bowl stands on five shafts with channelled mouldings. An ingenious explanation has been offered of the series of carvings on the font panels as denoting the outline life of a man once given up to worldly lusts and pleasures who, by the power of the Holy Spirit, was changed and became a bishop of the Church. This is creditable to the ingenuity of the inventor, but scarcely probable. Hunting scenes are often found on early fonts, and no one would have regarded such a pursuit as an evil; but that there is an intentional contrast between the snake-entwined head listening to all the suggestions of

evil, and the regenerated mitred head bringing forth the fruit of good works, there can be but little doubt. The twolions passant doubtlessly betoken the arms of the donor of the font; but such a charge, especially without the tinctures, is difficult to identify, for it was borne by so many families, among others by Carter of St. Columb, Cornwall.

This remarkable font used to stand at the west end of the nave. It was moved early in last century, when an interesting alabaster tablet sculptured in relief was found beneath it; it was in good condition, and had doubtless been buried (as was the case with the fine alabaster *Pieta* in Breadsall Church) for preservation during the iconoclastic period of the Reformation. The carving represents the painful scene of the martyrdom of St. Bartholomew, the patron saint of the church. The style of the work dates the XIVth century, and it was doubtless brought to Lostwithiel at the time of the rebuilding of the parish church. It is of Derbyshire alabaster, and almost certainly came from the great gypsum quarries of Chellaston, whence the Nottingham artificers in such objects of devotion obtained their material. This alabaster panel, which is 1 ft. 10 in. long, was placed over the doorway into the tower, at the west end of the nave, in 1879. It is too high for inspection, but as the scene (repainted) of the flying of St. Bartholomew is too realistic for modern taste, its height is, perhaps, an advantage.

Against the pier by the south entrance, close to the font, is a singular oak alms-box, which stands 38 in. high, apart from the modern box now affixed to the front. On the upper face is the following, in raised characters:—"W. T. Water. 1645." The lower part represents a clumsily-executed human figure with hands erected, bearing a large uncharged shield. On one side of the upper part were the initials R. L. Bad taste is the taste of this alms-box, the date shows that the church was at least in some kind of use the year after the explosion.

Outside the south porch is the tomb of the donor of this poor's box, consisting of a substantial granite chest tomb, with a somewhat mutilated covering slab of slate, having a well-cut floral border of rose and thistle. The inscription is partially obliterated, but commemorates William Taprell (often Mayor of this Borough.)

There is a trefoil-headed piscina niche on the south side of the chancel, and there are also piscinas in each of the chancel chapels. In the south porch there is a somewhat unusual holy water stoup of quatrefoil shape.

When the church was restored in 1878-9 some handsomely-carved corporation pews, dated 1776, were removed. However, the well-carved arms of the chancel and those of the first Earl Mount-Edgcombe (Recorder of the Borough) have been preserved, and are placed against the piers each side of the chancel. Like over 90 per cent. of Cornish churches, Lostwithiel has no chancel arch, but there are signs of where the rood-loft stood, which went right across the church.

Against the north wall is the much worn brass of a squire in plate armour,

with well-defined circular spur rowels of five points; the lower part of the cross-hilted sword is missing. The epitaph below runs:—*Hic jacet Tristramus Curteys Armiger qui obiit quintodecimo die Aprilis Anno dni millesimo CCCCLXIII. cuius amine propicietur Deus, Amen.* The ancient family of Curteys held a high position in the town and neighbourhood, and represented the borough in several Parliaments from Edward I. onwards. Tristram Curteys of this monument was Member for Lostwithiel in the Parliament of 1421. Leland, in the time of Henry VIII., wrote of his descendant as "a man of 100 marks land, dwelling between Blowgham and Penknek by Lostwithiel." A stained-glass window of the south aisle is to the memory of various members of the Curteys family between 1810 and 1866; though Lysons, writing in 1814, states that the family is extinct.

The only other monument of any age in the church is one to Temperance, the wife of William Kendall, 1579.

There is a singularly fine double set of silver-gilt communion plate, of the date 1775.

For certain particulars in this account of Lostwithiel church we are indebted to information kindly supplied by the vicar, the Rev. R. D. Purves.

NOTES.

THE Secretary of the Society
York Minster. for the Protection of Ancient

Buildings has written to the *Times* protesting against the erection of new buttresses and flying buttresses on the north side of the nave of York Minster, in imitation (as we conclude) of those existing on the south side. We have printed one or two letters from residents in York protesting against the work, which we did not at the time support by any comment of our own, as it is so difficult to get at the truth in these cases; local correspondents almost always exaggerate these things, and we were unwilling to join in an attack on Mr. Bodley, who is the architect in charge. If, however, Mr. Thackeray Turner has got the facts correctly, we must say that we agree with him. There is no doubt that the original builders of the nave would have vaulted it in stone if they had not been afraid, and that they erected flying buttresses on one side at all events in preparation for the thrust of the vault, but subsequently shirked it, and constructed a sham vault of wood (for there were shams even in the Middle Ages). Now, if it were proposed, at this eleventh hour, to carry out the stone vault, and build the necessary buttresses to resist its thrust, we should be in sympathy with that (though we have no doubt Mr. Turner and his Society would hold up the hands of horror at such an idea), because that would be carrying out in a logical and constructional manner a work which would complete what the original builders wished but were afraid to do, and would make the nave a monumental erection in a sense in which it is not so now. But if there is no such intention (and we have not heard of it), then the building of flying buttresses which will be not only useless but prejudicial to the

structure, is an absolute absurdity and a waste of money, and ought to be strongly opposed on grounds of ordinary common sense.

The
Kilmarnock
Bridge
Collapse.

FORTUNATELY we very seldom hear in this country of accidents such as that which occurred at Kilmarnock last Saturday afternoon. The structure, which failed almost immediately after it had been formally opened, was a small wire-rope suspension bridge over the river Irvine. Being designed simply for foot passengers, the bridge was only calculated for a maximum load of 20 tons, and it appears that, upon the conclusion of the opening ceremony, numbers of the people who had collected on either bank of the river rushed upon the platform with the object of being among the first to make use of the new means of communication. This ambition was defeated by reason of two developments: the first being a scrimmage caused by the meeting of the competitors in the middle of the span, and the second the sudden collapse of the structure. As the platform of the bridge was only a few feet above the water, which is of no great depth at the site in question, no lives were lost, although several persons were somewhat seriously injured. The suggestion has been made that the mishap was due to a flaw in a link of the anchor chains and that this caused the chain to give way, thus throwing the whole strain upon one side, and pulling one of the wire ropes through the socket of the fastening block. No doubt the bridge may have failed in this way, for a chain is bound to give way at its weakest link, but we think the contributory cause is less likely to have been a flaw in the metal, than the weight and dynamic effect of some two or three hundred athletic Scotsmen wildly struggling in a dense mass on the platform of the frail structure. The Ibrox Park and the Perth disasters* already teach us that the influence of crowds on the safety of structures is not universally recognised in Scotland. These disasters, however, might have suggested to the authorities of Kilmarnock the desirability of taking precautions to prevent any dangerous overcrowding on the new suspension bridge.

THE debate on Motor-Car
Motor-Cars. Traffic and Regulations, if it has done nothing else, has

shown the general feeling of the country upon the subject, as expressed by the county members. There is no use in blinking the fact that the moderate motorist is such a *rara avis* that few have the pleasure of meeting him, at any rate in the country, and that the large majority of motorists take little care to consider anyone but themselves. Two points at least require consideration in the law. In the first place, it is the owner who should be made liable to penalties for offences against the Act, and not merely his servant, the chauffeur; and in the second place, the local authorities should be given a free hand in regulating this traffic in their districts. It is difficult to appreciate the attitude of the Local Government Board in this matter.

* The Builder, Vol. lxxxiii., p. 27, and Vol. lxxxv., p. 153.

They are often jealous that the sanctity of local government should suffer no violation; thus in the matter of building by-laws the public are informed that the discretion of the local authorities must not be interfered with from headquarters, and that, having got local self-government, we must abide by it; yet under section 9 of the Motor-Car Act the local authorities have to obtain the consent of the Local Government Board before making any restrictive order in their districts. What has been the result? We are informed by the President of the Local Government Board that only forty-nine authorities made an application out of a total of 277, but when we find that only two applications have been granted, and when it is remembered that these applications are followed by local inquiries, at which motorists are represented by legal practitioners, and much expense is involved, it is hardly surprising that more applications have not been received. Many roads are entirely unfit for express traffic; they were not made for it, and abound in curves and dangerous places. These dangers are particularly within the knowledge of the local authorities, and here at least they should be given a free hand.

Tramways on the Embankment. AFTER full discussion a Select Committee of the House of Commons have now decided in favour of the proposals made by the London County Council for joining up the Westminster and Blackfriars tramways by means of a connecting line along the Victoria Embankment. But this decision is very wisely qualified by the conditions that Blackfriars Bridge must be widened and that provision must be made for safeguarding the tunnel of the District Railway. The matter is not yet settled, because there is no power in the present Bill for widening the bridge, and it will not be known until the end of this month whether the City Corporation will be prepared to facilitate the tramway project by exercising their own powers. If the Corporation should prove unwilling to make a working agreement with the County Council, the only alternative will be the presentation of another Bill next year. In the meantime it is satisfactory to find that the Select Committee are agreed that the scheme generally is a beneficial one, and that the tramway will constitute a much-needed improvement in traffic facilities.

Bridge Building in the Report of the Public Works Department of New South Wales. South Wales some interesting particulars are given relative to the maintenance of existing bridges, to the number of 3,508, and with an aggregate length of 328,941 ft.; the completion of forty-six new bridges in various parts of the country; the progress made upon twenty-nine bridges in course of construction; and the designs for projected works of the same character. Bearing in mind the comparatively small sum annually placed at the command of the Commissioner and principal engineer, it is quite clear that new construction must be retarded and maintenance requirements must fall into arrears unless considerable additions be made to future votes.

Of the new bridges opened for traffic last year the most noteworthy is one across the Hunter River at Luskintyre, having a total length of 917 ft., and including two steel truss spans each 198 ft. long and 25 ft. deep, in addition to fifteen timber spans, two of 30 ft. and the remainder of 35 ft. The centre pier, 60 ft. high above the river bed, is sunk 38 ft. below that level to bed rock, and owing to its great height the wrought-iron cylinders were placed on a batter of 1 in 12 to secure a wide base, the cylinders being braced together laterally and connected to 6 ft. diameter cast-iron cylinders forming the foundation below the river bed. It is satisfactory to note that this structure has sustained without injury several high floods, one of which completely carried away a low-level bridge a short distance downstream. Another point worthy of remark is that the independent truss design adopted in this work shows a considerable saving in first cost over the continuous girder bridges previously built across the Hunter River. Moreover, the cost of maintenance should be much less, as the area of members requiring to be painted is comparatively small.

Timber for Railway Sleepers. RAILWAY engineers, like all professional and business men, are apt to let their practice run in grooves, sometimes created by themselves but more frequently by their predecessors. The point of this note is to draw attention to the superiority of hand-hewn over sawn sleepers for permanent-way construction. Established custom in England is in favour of the last-mentioned treatment, which continues to be specified as a matter of course. In progress of time the marked superiority of axed sleepers will be duly recognised in this country as elsewhere. Australian railway engineers, who ought to be capable of forming reliable opinions on the subject, are unanimous in the adoption of nothing but hand-hewn sleepers, thinking durability more important than mere appearance. After all, as the bottom of a sleeper is never seen, and as the sides are more or less covered by ballast, very little is gained by insisting upon the use of a saw, if the top surface be truly faced up. Timber experts show that the hand-dressed sleeper is the more durable, as it is axed with the grain, and the action of the tool, effectually closing up the outer pores of the wood, results in comparative immunity from cracking and splitting when the sleeper is laid in the road. Another important consideration is that sawing involves an increased cost of from 3d. to 6d. per sleeper, according to size. A railway track is never a thing of beauty, and there is no reason for wasting money and sacrificing strength and durability out of regard for mere appearances in such work.

Electric Lamps. In the *Bulletin* of the Société Internationale des Électriciens, which has just been published, there is a valuable and suggestive paper by M. Bainville discussing methods of improving the design of glow lamps. He points out that the ratio of the energy of the light rays emitted by a carbon filament to the total energy radiation is less than 3 per cent.,

and thus it is possible that the cost of the electric light may be very considerably reduced in the near future. From the theoretical point of view, the ideal filament should possess a polished white surface which would remain unaltered at high temperatures. The carbon filament, therefore, is far from satisfying the theoretical requirements, and the author tested lamps with filaments of osmium and tantalum respectively to see whether higher efficiencies could not be obtained. He found that one of the osmium lamps made by Dr. von Welsbach only took about one-third of the current required by an ordinary glow lamp in order to give the same light. The drawback to this type of lamp, however, is that, as at present constructed, it is not suitable for running on ordinary lighting circuits as the filament is so brittle. With the tantalum lamps of Messrs. Siemens & Halske equally high efficiencies were obtained, and the lamp is quite suitable for everyday use. The experiments of physicists during the last few years have proved conclusively that the emissivity of a body for light rays does not depend merely on its temperature. The laws, therefore, which are given in nearly all the standard works on light and photometry as to the light emissivity of incandescent bodies need to be extensively modified. A square inch of incandescent platinum gives out much more light than a square inch of carbon when both are at the same temperature. Now the physical properties of tantalum are very similar to those of platinum, and thus the high efficiency of the tantalum lamp is probably due to the fact that as its temperature increases the ratio of the light radiation to the total radiation also increases. In commenting on this paper, M. Guillaume, one of the leading continental physicists, emphasises the importance of the new physical laws discovered, and points out their application in lamp manufacture. He also states that he has found that the "luminous efficiency" of a carbon glow lamp—that is, the ratio of the luminous radiation to the total radiation—is much less than 3 per cent.

Sanitary Condition of the Local Government Haverfordwest. DR. J. SPENCER LOW's report upon the sanitary Board upon the sanitary circumstances and administration of the Haverfordwest rural district discloses a disgraceful state of things. Dwellings presenting unhealthy conditions abound throughout the district. The common defects are dampness and absence of sufficient light, ventilation, eave-spouting, and proper flooring. In some instances the interiors of dwellings are very dirty. Water supply is in a most unsatisfactory condition; water for many outlying cottages being derived from roadside dippings, liable to pollution by road washings and to fouling by cattle. A large proportion of the houses in the district is absolutely unprovided with closet accommodation; the occupants of such houses being compelled to resort to their gardens, to fields, or to other convenient places; or to use pails inside their houses, emptying the pails of excrement wherever they can. The contents of middens and privies are disposed of in Fishguard by emptying them over the cliff, thereby occasioning filthy accumulations on the

and causing grave nuisance. It is not surprising to find, after this, that there has been an outbreak of diphtheria in Fishguard."

There is at present on view at the Montague Fordham Gallery a charming collection of jewellery and shagreen by Mr. Paul Cooper. Perhaps the greatest test of a jeweller's ability in design is whether he can turn out a cup or bowl of good design; Mr. Cooper shows both. After looking at these we can enjoy to the full the beauty and quaintness of the gold and silver jewellery ornamented with precious stones, the work of the same hand. Each piece is a romantic little design of the pre-Raphaelite or Gothic type of inspiration. In nearly all cases the stones are used to ornament the metal and not the metal to set the stones. The workmanship throughout appears to be thorough and much more highly finished than is too often the case with modern English jewellery. Other exhibits of interest at the gallery are some pieces of pottery by Messrs. Martin Brown, and useful objects in iron, brass, and bronze by Mr. E. Spencer.

LETTER FROM PARIS.

The Musée des Arts Décoratifs, definitely managed in the Pavillon Marsan, has at last been formally opened. The ceremony has afforded an opportunity for appreciating the work of the architect to the Louvre, M. Redon, who has entirely transformed the portion of the Louvre along the Rue de Rivoli and facing the Salon de Flore. Sixty new rooms have been added to the Union Centrale, which at its commencement was installed in the Palais de l'Industrie. The removal of that building has now the occasion for giving the collection a larger and more sumptuous home, in which, thanks to M. Peyre and other generous donors, can be grouped on a methodical system and with provision for future extension. The new rooms have been arranged by M. Redon around a very large central gallery lighted from a series of small cupolas. The central hall, preceded by a vestibule, leads to a large gallery looking on the Tuilleries, the balcony of which overlooks the old "Jardin Royal." The museum will be open every day, from mid-day on Mondays and from 10 o'clock on other days, till 5 p.m. in summer or 4 p.m. in winter. The entrance will be one franc on ordinary weekdays, half a franc on special holidays, and free on Sundays.

At the other end of Paris, in the middle of the Bois de Boulogne, another museum has just been opened which will find great favour in Paris, especially in the artistic world—that of the Château de Bagatelle, the former home of Sir Richard Wallace, purchased by the Municipality of Paris, and put gratuitously at the disposal of a group of wealthy amateurs, who allow their collections to be seen there at the cost of a small entrance fee, the proceeds of which will be devoted to the purchase of the works of eminent masters as may be offered to the City of Paris with the view of making a permanent collection. Various pictures of the English school have formed the subject of the first exhibition, which occupies one of the pavilions, and includes works by Gainsborough, Hopper, Reynolds, Romney, Lawrence, and Constable. In the other pavilion, which is a kind of small edition of the museum, built by the Comte d'Artois and bearing his motto "Parva Domus sed Apta," is a collection of furniture and curiosities of the 17th century art, containing many rare and beautiful objects, arranged so as to give an impression of the interior of a princely mansion of the pre-Revolution period.

At the Galliera Museum the illustration of industrial art is well kept up. Following on the exhibitions of bookbinding, of ivories, and of bronzes, we have now an exhibition of metal work—wrought iron, copper, and pewter. No exhibition in Paris is of more value to artists and craftsmen. In instituting these annual

exhibitions the Municipal Council has proposed to render the Galliera Museum a place for the encouragement and instruction of those, either already famous or still unknown, who are applying original invention and technique to objects of practical use. The present exhibition includes lamps and lighting standards of various kinds, doors, stair balustrades, cages for lifts, etc.; many of them representing the work of the best artists of this class in the present day—Jules Brateau, Carrière, Alexandre Charpentier, Desbois, Brindeau, Deschamps, Larche, Pierre Roche, Lucien Magne, Damp, Heintschel, and others; the whole forming an excellent and valuable illustration of applied art.

On the 10th inst. the Académie des Beaux-Arts will proceed to the election of an artist to succeed the late lamented sculptor Jules Thomas. The most prominent among the candidates spoken of are M. Injalbert and M. Saint-Marceaux; after them, MM. Peynot, Verlet, Hugues, Tony Noël, Gustavo Michel, and Gardet. The last-named is supposed to have considerable chance, especially in view of the fact that the predecessor of Jules Thomas was a celebrated animal sculptor, Barye. The Académie, it may be added, is at present in much anxiety in regard to one of its most brilliant members, M. Henner, whose serious illness, at his advanced age, threatens a new loss from their ranks.

The new and energetic Under-Secretary of State, M. Dujardin Beaumetz, whose zeal for art and artists is constantly displayed in some new form, has just put an end to an abuse which has existed for many years. It is known that the Government possesses, at the Dépôt des Marbres in Rue de l'Université, a series of studios, the use of which has been granted gratuitously to artists, some of whom have assumed a permanent right in what was only intended as a temporary convenience. This will now be altered, and these studios will only be lent to artists who have to execute an important Government commission, and then only during such time as the work is in progress. This perfectly reasonable and just decision has caused a great deal of umbrage to some well-known artists, who had got into the habit of considering themselves on their own premises in these large and convenient studios, where they could carry on their private commissions without paying any rent for their studio. M. Dujardin Beaumetz has also appointed, as a member of the "Conseil Supérieur de l'Enseignement des Beaux-Arts," M. Antonin Carles, the sculptor, in place of M. Gustave Michel, who has been appointed a Professor at Ecole des Beaux-Arts.

In spite of the Parliamentary debates on the separation of Church and State, the work of the Church of Sacré-Cœur goes on, slowly indeed, but without interruption. The foundations are just completed for the great campanile which is to be raised near the *chevet* of the church, and will dominate all Paris. The substructures have now been brought up to the grand level, and the building of the tower itself can be commenced without further delay.

A great deal of criticism has been aroused by the bad taste shown in the decoration carried out in the Avenue de l'Opéra in honour of the visit of the King of Spain; the more so as there is talk of retaining permanently what was at first carried out only as a temporary scheme. This decoration comprises a series of flower vases of commonplace and heavy design, in imitation bronze surface, placed at intervals all along the avenue, mounted on pedestals or pillars destitute of style. At each extremity of the street have been established two erections consisting of basins supported by terminal female figures, also in imitation bronze. There is no really artistic note in the whole scheme, and it would have been anything but gratifying to Chas. Garnier as an accompaniment to his great building.

The Médaille d'Honneur for Architecture at the Salon has been awarded to M. Chérol, for his set of drawings exhibited under the title "Etude sur l'habitation antique," and described in our article on "Architecture at the Paris Salon." In the section of Painting the medal has not been awarded; in that of Sculpture it has been awarded to M. Sicard.

APPOINTMENT OF SANITARY OFFICER.—The Local Government Board has sanctioned the appointment of Mr. W. Johnson as a sanitary inspector in the Metropolitan Borough of Poplar.

COMPETITION FOR PUBLIC BATHS AND WASHHOUSES, HAMMERSMITH.

Six architects were invited to compete for this building, and their designs have been exhibited this week in the Hammersmith Town Hall. The site selected for the building is of simple area but curious shape. On the east side it has a frontage of only 70 ft. to Lime-grove, while the total depth of the site is about 520 ft. The only other street adjoining the site is Scott's-road, which runs along the rear two-thirds of the south side. On the north of the plot of ground the technical school will be built, and to the west of a projecting wing of this building, the width of the ground is approximately double that of the easterly portion. With the exception of the two frontages to Lime-grove and Scott's-road, there appear to be no rights of light over any of the adjacent properties, and this fact has added materially to the difficulty of planning the buildings.

The accommodation required included a first-class swimming-bath, 105 ft. by 34 ft., arranged for use by women on certain days, a second-class swimming bath, 100 ft. by 30 ft., four unequal groups of shower and shower-baths (first and second class for men, and first and second class for women), with provision for future extensions, a public washhouse and ironing-room, with provision for a future doubling of the accommodation, residences for the superintendent and engineer, a committee-room and offices, clubroom, lavatories, etc. Competitors were also asked to provide a chimney-shaft for the joint use of the Baths and Technical Institute, and as the boilers of the latter building are to be placed in the wing mentioned above, the best position for the boilers of the baths is obviously near this point. Another condition, which has not been fully considered by all the competitors, was to the effect that the requirements of the London County Council in connexion with the granting of a music and dancing licence in respect of the first-class swimming bath must be provided for. Other accommodation necessary in a building of this class, such as a separate laundry for the bathing establishment, was not mentioned in the instructions. The limit of cost was fixed at 45,000*l.*, and each competing architect will receive a fee of 25 guineas.

The six designs submitted in the competition were hung in the council chamber in numerical order, but the authors' names were not given. In the accepted design (No. 4), Mr. J. E. Frank has mastered the difficulties of the site more thoroughly than any of the other competitors, and has produced a simple and convenient plan. By careful restriction of the space given to open areas he has been able to provide all the accommodation on the ground floor, with the exception of the committee-room and the residences for the superintendent and engineer. As these rooms on the upper floors are placed along the frontages to Lime-grove and Scott's-road, windows can be used for lighting them and the rooms under, while for all the other rooms and corridors direct top-lighting can be adopted. The administrative portion of the building occupies the frontage towards Lime-grove, and has the ticket-office in the middle of the front, with the women's entrance on the left and the men's on the right. Corridors are continued back from these entrances, and between the corridors are the ticket-office already mentioned, a small refreshment-room, and a cycle-room, all of which have doors opening into the two corridors, the refreshment-room and cycle-room being divided by screens into two portions for men and women respectively. To the right of the men's entrance is the superintendent's office, and beyond this is the private entrance to the stairs leading to the committee-room and superintendent's residence on the first and second floors. The space to the left of the women's entrance is occupied by an entrance-hall of ample size, with two entrances from Lime-grove, and with a separate ticket-office, and from the back of this hall the main corridor, 10 ft. wide, runs along the south boundary of the site to the first-class swimming-bath the corridor terminating with exit doors at the east end of Scott's-road. The entrance-hall and main corridor are intended to form the public approach to the first-class swimming-bath when this is used for entertainments. There is also a doorway between the entrance-hall and the women's corridor, so that the main corridor can be used by women on the days when the swimming-bath is reserved for them. The women's corridor runs in a straight line past

the question of cost and the amount and apportionment of the premium or premiums.

(b) To determine whether the designs conform to the instructions, and to exclude any which do not.

(c) To advise the promoters on the relative merits of the designs admitted to the competition, and to make a selection in accordance with the instructions.

3. It is essential in drawing up the instructions to state definitely which of the conditions must be strictly adhered to, and which are merely optional or of a suggestive character.

4. The promoter of a competition, and no assessor, may, upon it, nor any employee of either, should be engaged to complete, or act as architect, for the proposed work.

5. The number, scale, and method of finishing of the required drawings should be distinctly set forth, and they should not be more in number, or to a larger scale, than necessary to clearly explain the design, and such drawings should be uniform in size, number, mode of mounting, and mounting. If the assessor advises that separate drawings are desirable, it should be so arranged.

6. Competitions should be conducted in one of the following ways:—

(a) By advertisement, inviting architects willing to compete for the intended work to send in designs. The promoters, with the advice of the assessor or assessors, should make their selection from such designs. The author of the design awarded the first place should be employed to carry out the work.

(b) By advertisement, inviting architects willing to compete for the intended work to send in their designs by a given day; with such other information as the candidate may think likely to advance his claim to be admitted to the competition. From among the designs so received, the promoters, with the advice of the assessor or assessors, should select a limited number to compete, and each competitor thus selected should receive a specified sum for the preparation of his design. The author of the design awarded the first place should be employed to carry out the work.

(c) By personal invitation to a limited number of selected architects, to join in a competition for the intended work. Each competitor should receive a specified sum for the preparation of his design. The author of the design awarded the first place should be employed to carry out the work.

7. No design should bear any motto, device, or distinguishing mark; but all designs should be numbered by the promoters in order of receipt. Any attempt to influence the decision of the promoters, or of the assessor or assessors, should disqualify a competitor.

8. The author of the design placed first by the assessor should be paid in accordance with the schedule of charges sanctioned and published by the Royal Institute.

9. No instructions are given to him to proceed within twelve months from the date of selection, or if the proposed works are abandoned by the promoters, then the selected architect should receive payment for his services in connection with the preparation of the competition drawings of a sum equal to 10 per cent. on the amount of the estimated expenditure.

10. In every case the amount of premium or remuneration for the competitive designs should be fixed under advice of the assessor or assessors.

11. Where a deposit is required for supplying the instructions, it should be returned on the receipt of a bona fide design; or if the applicant declines to compete and returns the said instructions, within a month after the receipt of replies to competitor's questions. The deposit required should not exceed the sum of one guinea.

12. Each design should be accompanied by a declaration, signed by the competitor, stating that the design is his own personal work, and that the drawings have been prepared under his own supervision.

13. A design should be excluded from a competition (a) If sent in after the period named (accidents in transit excepted);

(b) If it does not substantially give the accommodation asked for;

(c) If it exceeds the limits of site as shown on the plan issued by the promoters, the figured dimensions on which should be adhered to;

(d) If the assessor or assessors should determine that its probable cost will exceed by 10 per cent. the outlay stated in the instructions, or the estimate of the competitor should no outlay be stated. If the assessor or assessors be of opinion that the outlay stated in the instructions is inadequate, he or they should not be bound in the selection of a design by the amount named in such instructions, but the question of cost shall nevertheless be a material element in the consideration of the award;

(e) If any of the other instructions are violated.

12. It is desirable that all designs and reports submitted in a competition, except any excluded under clause 11, should, with the consent of their authors, be publicly exhibited after the award has been made, which award should be published at the time of exhibition. At the close of the exhibition all the designs, with the exception of the one placed first, should be returned, carriage paid, to their authors.

13. It is essential to the success of any competition that the promoters should agree in their instructions that the award of the assessor should be adhered to unless there is some valid objection to the employment of the author of the design placed first, as to which the assessor should be satisfied.

14. In the case of works of inconsiderable magnitude it is desirable that three assessors should be appointed. As stated above, the President of the Institute is always ready to advise on this or other points.

Mr. Horace T. Bonner moved—"That in the event of the President or Council being applied to by promoters of competitions to nominate competing architects, notice of such application shall be published in the *Journal*, and members of the R.I.B.A. who are willing to take part in such competitions be invited to send in their names for selection by ballot as competitors."

After discussion the motion was negatived.

NOTES AND SKETCHES IN SOUTHERN ITALY.—XI.

MOLFETTA AND TROJA.

MOLFETTA was the principal city of Puglia Peucetia, the district now known as the Terra di Bari. It stands on a peninsula, with a modern suburb joining the old town to the railway station, having the sea on north, west, and east. It is only three miles from Giovenazzo. Its foundation is of course ascribed to Trojan heroes, and greater antiquity is claimed for it than for Rome by its historians. A Greek city, as is proved by vases and arms which have been found in tombs, it had to submit to the Romans after the Samnite war, in which it had been on the Roman side, not being allowed to withdraw from the connexion. It suffered like the rest of Italy from barbarian incursions, but was restored by Roman refugees, who gave it the name of Melfito, "because life was like honey there compared with what they had gone through." The confusion between the three Melfis in the chronicles

allows of the same story being told of the founding, or refounding, of Molfetta, Melfi, and Amalfi. Lombardi, the historian of Molfetta, gives this detail from Rubeo, and makes a point of Melfi not being a seaport, and therefore could not be a place at which refugees from Dalmatia would arrive. The original name appears to have been Chahalfetus, the bishop appearing in the Vatican register as "Epi: Chahalfetanus." It was under Byzantine rule in the XIIIth century, and was besieged by Bohemond and Roger, the former of whom left the siege to go to the Crusades. The earliest bishop whose monument still exists in the cathedral is Riccardo, who died just after Charles of Anjou's victory over Conradino, August, 1271. The city was consistently faithful to the Angevins. It was given to Amelio del Balzo by Robert III., son of Charles II. of Anjou, together with Bari, Giovenazzo, Trani, Gioja, and Bisceglie. In 1484 Innocent VIII. (Cibo), who had been bishop of Molfetta for nearly eleven years, was elected Pope. Five years later he freed the city from the jurisdiction of the archbishop of Bari and put it directly under the Holy See. Together with the bull, he sent to the bishop a white horse without a bit, as symbolic of the taking away of the ancient bridle. It remained thus free till 1551, when it again had to submit to Bari. In 1515 the chronicler relates that the walls were restored and the port and streets cleaned. Before this the Emperor Frederick II. wrote a sarcastic distich upon it, and the city still has a bad repute for its filth. In 1522 it was given by Charles V. to Ferrante of Capua, Duke of Termoli; it then lost the title of "royal city," and the municipal liberties were extinguished. Shortly after it was sacked by Lautrec. It has now some 25,000 inhabitants, still retains part of its walls, gates, and great towers of defence, and is of some importance as being the outlet for the produce of Terlizzi, Ruvo, Bitonto, Palo, and even of Giovenazzo and Bisceglie. In 1835 Giovenazzo and Terlizzi were united to its bishopric, but the bishop's seat was moved to the XVIIIth century Jesuit church after the expulsion of that order, and the ancient cathedral is now little thought of.

It is, however, an exceedingly interesting building (Fig. 1), bearing much resemblance to the Byzantine churches of the IXth and Xth centuries—in plan a Greek cross with three cupolas over the nave, and with the aisles vaulted with a half wagon vault as at S. Francesco, Trani. The central cupola is the highest. It and the lower one to the west are octagonal externally, the eastern one appearing square, the two latter being hemispherical in the interior. The date of its foundation is not recorded, but the eastern façade is arranged in the same manner as the Barese churches, with similar



Fig. 1. Cathedral of Molfetta.

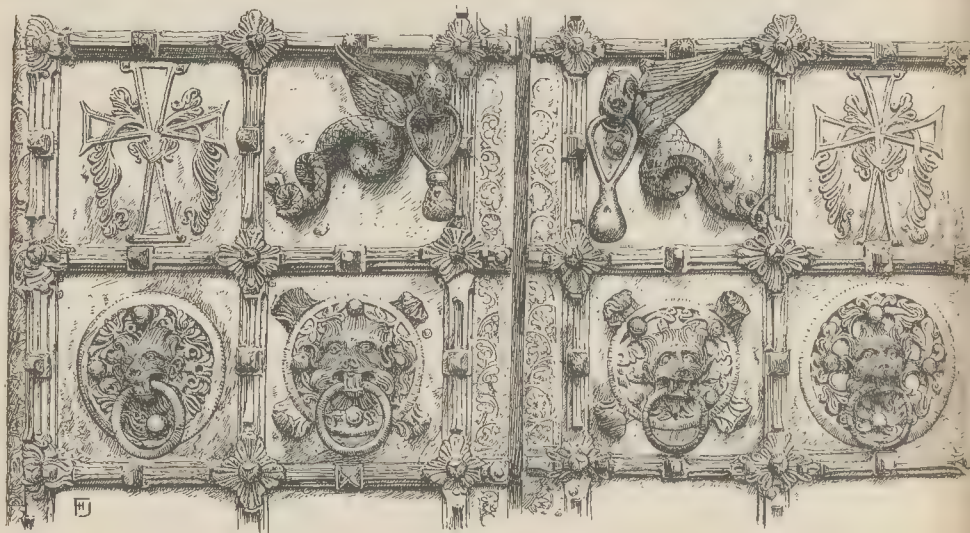


Fig. 2. Part of West Doors of Cathedral, Troja.

details, and it is probably a building of the XIIIth century. It was dedicated to the Virgin and later to S. Conrad, whose relics were preserved within. The original rose window still exists on the west front, but the entrance has been destroyed by a later chapel. The whole western façade was walled up in 1870 to preserve the church from incursions of the sea, which washes the north side. The east end has a simply decorated window (with lions at the sides and rather Oriental enrichments in places) in the wall between the towers, and interlaced flat arading supported alternately on pilasters and corbels. Beneath the window the interlacing stops and the arading drops to a lower level, with a moulding above at the height of the springing of the other arches. A similar interlaced arcade may be traced on the side next the sea. The windows in the towers resemble those at Trani. The first story has a blank tall arch in one and in the other a two-light lintelled window with a low-gabled tympanum above a central colonnette. The second story has a high arched sinking with a two-light pointed window with a central column, a cinquefoiled head, and a diamond piercing in the tympanum. The third has a two-light round-headed window in a recess, the upper edge of which is formed by a corbel-table of four round arches beneath another of six, above which is an ornamental frieze, terminating with a projecting cornice. There were inscriptions on them; all that is legible now is "*E. Turris sacros ante annos*." The western end and the sides of the western part of the nave have chapels round them, some of the XIVth century and some later. There is a narrow stair of approach, but the usual entrance is through the sacristy. Three XVth century windows above one of the doors were the gift of Innocent VIII. The cupolas spring from great piers with richly-carved caps, the re-entering angles running up plain to the abacus moulding, which is generally carved. Sometimes figures and heads appear among the foliage. The aisles have small, round arches behind the piers thrown across to corbels in the outer wall, and a wall above them to the height of the vault. The choir was once on a higher level than the nave, as is shown by the piers on which the columns stand in this part of the church, and by little windows behind and at the sides, which once lighted the crypt. This had to be filled up owing to the infiltration of sea-water. A Byzantine-looking relief is encrusted in the pier, representing Christ and the Apostles, perhaps part of the choir enclosure, and portions of the XIIIth century choir stalls are preserved, carved with great vigour. In the chapel to the north of the apse is an ancient picture in which the donor kneels with raised hands before the

Madonna, who is suckling Christ. Angels hold a curtain behind and SS. Paul and James stand at the sides. The next chapel has ribbed vaulting springing from corbels, and a band of ornament round the window. The chapel of S. Julian, which has a round window in the gable beneath ramping corbelled arches (externally seems to be at least as old as the main building, which shows by the interruption of the arcades of the south wall that it was built at two periods. The bay before the apse has pendentives with a projecting moulding, and corbels of grotesque heads; in the wall above the keystones of the arches are shapeless angels, and a carved band runs round the base of the dome. The central dome has squinches. M. Bertaux, the latest writer on the art of Southern Italy, thinks that the Apulian domed churches are imitations of Byzantine models by Italian craftsmen—S. Andrea, Trani, S. Margherita, Bisceglie, and S. Pietro di Balsignano are evidently such copies or adaptations. He bases his opinion on facts of construction for which Sig. Bernich, who has superintended many of the restorations, vouches and believes that the "trulli"—the rude stone circular buildings which are so frequent in Apulian vineyards and olive groves—are the real fathers of these domes, for the joints of the courses are not normal to the curve but horizontal—a construction traditional from prehistoric times (I believe that some of the Byzantine domes were built in this manner, however). These domes at Molfetta are constructed of a series of horizontal rings gradually narrowing, and the cupola of the cathedral of Bari is so also.

The other interesting church at Molfetta is S. Maria dei Martiri, which was erected between 1156 and 1162 in the cemetery of the two hospitals built by Roger, fifth Count of Apulia, to shelter crusaders and pilgrims going to or returning from the Holy Land by way of Brindisi and Otranto. It lies on the coast about a mile from the city. The foundation-stone was laid by request of Roger, archdeacon and vicar of the Molfetta bishopric, by Urrone, Bishop of Ruvo. The archdeacon and Sifando, advocate of the cathedral, gave two olive-yards to the church, which it still possessed 600 years later. William II. granted it protection by a diploma of 1174. It was then a square chapel, with pointed arches, upon which flat octagonal cupolas pierced with little windows rested, divided from the lower portion by a simple moulding. The nave has been rebuilt of late years, and calls for no remark, but the domed portion and the apse behind are interesting. In the crypt a copy of the Holy Sepulchre was made in 1500. The founder, Bernardino Lepore, brought with him from Syria sixty-two stones from holy places with which to construct

it. Here there is a Byzantine-like image of the Virgin of the XIIIth century. A holy picture brought from Syria in 1188 is taken by water Molfetta every year, where it stays for a time and then is brought back with great pomp. In the cloister outside is an ancient ciborium with an inscription on its architrave giving the date 1419. The shapes of the piercings of the upper part make this possible, though it looks early but the caps and columns which support are certainly more ancient. M. Bertaux thinks it came from the cathedral.

The town of Troja was founded by the Greek prefect Bugianus as a bulwark against Lombard power. Leo of Ostia gives the date 1022, and the inscription on the bronze door of 1127 says, "108 years from its foundation which makes the date 1019, but it seems probable that its real date is somewhat earlier, since it was certainly besieged for three months 1022 by the Emperor Henry II. The Amalfitan chronicler says it occupies the site of the ancient city of Eclanum. After pillaging the town 1060, Robert Guiscard began building a stronghold there, but lost it again twenty-two years later. It was sacked several times before Frederick II. levelled its walls in 1235 and it was again fortified and was a stronghold during the wars between Alfonso of Ferdinand of Aragon. The inhabitants carried off in procession with the Host and requaries in the endeavour to soften the hearts of the besiegers twice. With Henry II. the expedition answered, with King Roger II. it was not so successful. The town crests a hill of some size, six miles from a railway station, and though the walls no longer exist, is evident that it must have been a very strong place before the invention of gunpowder. The bishops had rule over Foggia and all its churches, and the later occupants of the see spent much of their time in that city because the climate was pleasanter, and so Troja became of little importance. Under John XIX. (1024-33) the bishopric was made directly subsidiary to the Holy See, the Pope sending the relics of forty martyrs as well as those of SS. Sergius, Bacchus and Sebastian to the cathedral. The bull engraved on a stone in the wall. Three councils were held in Troja—one under Urban II., March, 1093, at which fifty-five bishops and twelve abbots were present; the second under Paschal II., in 1115, principally with reference to the Truce of God; the third under Honorius II., in November, 1127, when King Roger was excommunicated.

The present cathedral (which is dedicated to S. Maria Assunta) was commenced in 1041 under Bishop Gerard, but one must have existed already one would think, for the Amalfitan chronicler says that Robert Guiscard brought to Troja from Palermo, as signs

factory in 1073, iron doors and many marble pillars with capitals. The greater part of the building was done by Bishop William II., Bugeotes, after a fire which took place in 1097, and it was nearly finished in 1105, when he brought thither many relics of saints. The celebrated bronze doors are of his time, and are dated 1119 and 1127. He was a warlike prelate, and attacked William of Hauteville for molesting pilgrims to Jerusalem, burnt his castle, and took him prisoner. The bronze doors and took in the western façade, and on the north side. They have considerable Byzantine character. Most of the inlaid heads and hands have fallen out, and where they remain they are of a reddish metal, cast, but they were originally silvered. On the left side, at the top of the western doors, are two figures together in the first panel, Odisius and Berardus. The second has Christ enthroned on the rainbow, with a cruciferous nimbus; his right hand is raised, the left holds a book. The third panel has Bishop William with a crozier, and the fourth SS. Peter and Paul, one with a triple and the other with a double nimbus. The second and fifth rows have eight heads of beasts, different in size and design, projecting considerably, and supposed to represent lions, but with noses well turned up, and showing also elements of other animal forms. The third row bears coats-arms referring to the restoration of 1573. The fourth has two crosses, with leafwork springing from them in the external panels and two dragons of wonderful technique with floor-knockers in their mouths. The crosses are very Byzantine in design, showing great affinity with those of the doors of S. Sophia, Constantinople. The sixth row has XVIIIth century bishops, and the seventh bears the inscription which gives Bishop William II.'s name and the date 1119. The door on the north side has the top row of panels somewhat similarly arranged. The first has an illegible inscription, the second Bishop William, with the tower before him, the right hand blessing and the left holding his crozier. In the third and fourth panels are SS. Peter and Paul. The next row gives four bishops ("Gualterius, Gerardus, Ubertus," and "Gulielmus.") Then three more bishops—Oranus with an ancient mitre, the first bishop of Troja; Angelus, Jeanes, and Stephanus, the second, third, and fourth bishops. Stephanus also has an ancient mitre, all are in the same attitude as Bishop William. The outlines are finely drawn and filled with a red mastic; faces, hand, and feet have fallen out. They all have nimbi. A row of four lions' heads comes next, very much like those of the western doors, the only portions in relief, and the two rows beneath them bear a long inscription, giving the names of Bishop William II., and of Odisius of Beneventum, who made the doors, and the date 1127. The lower part of the walls (Fig. 3) has external arcading in the Pisan manner, above which is a strongly carved frieze. The arches are often horseshoe in shape, the vousoirs are yellowish, and remain stones are used to make the ornament (either in the construction or inlaid), which is very elaborate in some parts, as at Caserta Vecchia, while the general construction is of grey tufa. On the architrave over the west door are rough sculptures. In the middle is Christ enthroned, blessing with the right hand and holding a book in the left; on both sides are candlesticks; on one side stands the Virgin, and on the other S. Peter in prayer, beyond on each side are two symbols of the Evangelists in entwined medallions, and then two bishops with croziers, blessing, at each end; those on the right are SS. Eleutherius and Secundinus. The carving is a good deal like Beneventan work.

Above the frieze a lion on each side, with an amazingly sentimental expression, bears on its back a slab on which two shafts stand coupled. On one side one is of porphyry and the other is cipollino. A round arch starts from their caps with heavily-carved archivolts, but there are traces of a pointed arch below it. Lions, a bear, and an ox spring from the wall at the sides. Under this arch is the elaborate rose window. The radiating colonnettes of it are mostly white marble, but one is of Breccia and two others veined and spotted, while one is quite dark. The spandril triangles outside the trefoiled arches (which interlace) are green and white inlaid in various patterns; the filling of the lights is of sheet-lead, with variously shaped piercings. On the north side are some fine carved roundels with birds, etc., on them

and inlays round. The eastern rose has rough tracery built of brick. The tympanum of the side door on the north side shows Christ treading on the lion and the dragon, blessing with the right hand and holding the book of life in the left. Angels on each side of him bend down and fit into the arch. The work is not so good as at Trani and Bari and again suggests Benevento. The lower portion of the western part of the church probably dates from 1069-83. The apse and the crossing are later, due to Bishop William (1173), and the upper portion of the south side has an arcade which finishes with a half arch butting against the wall of the crossing. Later alterations are also evident. The apse bears great resemblance to some of the Syrian churches of the VIth century, but is partly hidden by later buildings. It has fine bold arches with roughly and vigorously cut caps of foliage and lions' heads and two series of columns, one above the other. The angle piers terminate with simple mouldings beneath a corbelled cornice. The walls are some 3 ft. thick. The pillars all have a strong entasis and are made up to the proper height with additions. This suggests their being antique. Two lions prowl by the window above the lower row of shafts which have high bases. A deep cornice carved with leaves separates the two orders of four columns each.

Each side of the nave has six high granite shafts, which may be some of those brought by Robert Guiscard or may have come from the ancient Aclana, which was near, the last on the right being a coupled pair, a curious irregularity. In several cases they are made up to the right height by the addition of pieces either at the top or bottom. Their chamfered pedestals are so large that two pieces of marble are used for them. On some of them are little lions' heads. The caps are based on Corinthian and are carved with leaves and heads of beasts, among which one may see men's heads of an African type. They vary enormously in height, the deepest being quite twice the height of the shallowest. They are none of them antique; their abaci are unmodelled. The slightly later piers at the crossing have caps with sharply-cut foliage. The side aisles and the choir are vaulted with a pointed vault. The nave and transept have flat roofs, though the left arm has pendentives in preparation for a dome. On the piers of the crossing on one side are the four apocalyptic beasts, very Byzantine in feeling, on the other an angel with a book in the corre-

sponding place. The nave is unusually high, the tribune arch is round, but becomes pointed on the extrados, and there are some horseshoe arches on the exterior. The interior has been restored and beautified. Painted figures of the Apostles are in vestiges above the six columns with little scroll things as corbels below them. Some detestable blue glass modifies the whole interior with its colour. In the treasury are three ivory coffrets, two rectangular and one cylindrical, decorated with Coptic characters and paintings and with bronze feet. Perhaps Lucera work, or imitations of such work by Italians? The ambo of 1169, which was brought from S. Basilio, is rectangular, and rests on four shafts with high bases and spreading caps of Byzantine acanthus; the projecting parts have once been gilded and the other parts painted green. The faces above are divided into panels enclosed in broad bands or borders of ornament based on the vine. The front panel is plain with a colonnette in the centre supporting an eagle with outspread wings and book-rest. He holds a beast in his claws and stands on a man's head, which rests on the cap of the colonnette. One of the side panels has a Byzantine-looking lion with great eyes, which grips a sheep, surrounded with sharply-cut foliage. Behind the lion is another of smaller size. The other panel also is carved and the whole crowned with a rich cornice on two sides, which has traces of red on the ground. The meandering of the vine is rather sudden in its twistings, and the bunches of grapes lie sideways, as if this piece of the carving had originally been fixed in a perpendicular position. The sculptures are in a grey-green tufa, the rest yellow limestone. The Pisans had an establishment at Bovino, a few miles away, and some of the French archaeologists assume that the cathedral at Troja is either a direct copy of a Pisan church or built by a Pisan architect. It appears more probable that the inspiration was Byzantine for both the Pisan churches and those in Apulia which show the same characteristics, the more so that many of them appear in the beginning of the XIth century in the churches built at Ani in Armenia under the Bagratid Dynasty, where Pisan influence is impossible; which also show examples of the constructional use of the pointed arch and piers of a developed type usually associated with the Gothic of a much later period. The resemblance to the cathedral of Foggia, especially in the carving, is so great that it seems probable that the upper part of the façade



Fig. 3. Façade of Cathedral, Troja.

and the dividing cornice are the work of the same hands in both buildings, which may be assumed to date from the latter part of the XIIIth century.

S. Basilio is believed to be the oldest church in Troja, having been built soon after the founding of the town. It is a Latin cross in plan, with a little apse. The north arm of the cross was taken for a sacristy, the aisle wall being continued across it, and above this portion is an ancient tower with two bell openings slightly pointed; over the crossing is a cupola with four little windows and a pointed roof. The nave of four bays is lofty and has two windows on each side (over the second and fourth arches), as have the aisles. The arches are round and unadorned, except those opening from the aisles into the transept, which are pointed. The aisles are vaulted with a wagon vault, but plastered and painted to imitate cross-vaulting, and the nave has cross vaults resting on corbels. The columns are made up of several pieces, and some of the simple caps have two rows of leaves. Round arches span the transept (which is raised one step above the nave) to the sides of the apse.

The façade is simple and almost undecorated. There is one window above a door with a stilted arch. The arch is of yellow stone, the tympanum green. On the left side is a little door with an arch of white stone and an architrave formed of a piece of antique carving, which is also white; the tympanum is again green. Round the apse are four slender half columns with caps of foliage; between each pair are ten corbelled arches. The font has an arched round the bowl with shallow sinkings in the dividing ribs and is supported on a section of a column.

The "municipio" opposite the cathedral at the angle of the piazza has the lower portion panelled in stone, work of the period of the Early Renaissance, and a mass of solid masonry projects some distance beyond the panelling below it. A few Roman inscriptions are built into the wall of the post-office on the side of the *Vico Opeale*. Troja is so highly placed that in bad weather it is in the clouds, and the summit of the XVIth century campanile was often hidden by the drifting mists during the time I was in the city. F. H. J.

MAGAZINES AND REVIEWS.

THE *Art Journal* commences with a review of the Royal Academy by Mr. A. C. R. Carter, which is a happy variation from the fashionable habit of the typical art-critic of the day, of sneering at the Academy. Mr. Carter says, and truly:—"There never was an Academy exhibition without some works of promise, of inspiration, and of achievement. It is the business of him to whom the duty falls of writing about an annual display, to search for and find these redeeming features in the huge variety entertainment provided." One wishes that more art-criticism was written in this spirit. With the opinions expressed we feel generally in agreement, though we would have mentioned some things that are omitted. Mr. R. E. D. Sketchley contributes an article on "Buckinghamshire Lace," telling how in this day of hurry and machine-work "lace of pure design and fine quality is being made in many Midland cottages," and giving some beautiful examples, four of which are produced in stamped relief, which gives the exact appearance and texture of the work.

The *Burlington Magazine* contains a short and useful article by Mr. Roger Fry on Tempera painting and its distinctive effects and capabilities as compared with oil. Constantin Meunier is the subject of two articles, one of personal reminiscences, by Professor Petrucci, the other on his aim and place in the art of the XIXth century, by Mr. Charles Ricketts. Meunier is now taken up by the modern art-critics, as a sculptor of humble life, just as Millet was taken up, twenty years ago, as a painter of humble life; in both cases the recognition came too late to benefit the artist much, and in both cases the artist has been exaggerated, as people will find out in another twenty years. Meunier was draughtsman as well as sculptor, and some reproductions of his are given. An article by Sir E. Maunde Thompson on "A Rothschild MS. in the British Museum" is illustrated by reproductions of some most interesting mediæval illustrations to the said MS., which is a French translation from Boccaccio's Latin book "De Casibus Virorum et Feminarum Illustrum." Two of the illustrations include architectural subjects, one of them

a view of the attack on a château, by troops of course on quite a different scale from that of the buildings, the architectural details of which are nevertheless pretty carefully made out. Mr. Clouston's article (the seventh) on "Minor English Furniture Makers of the Eighteenth Century," deals with the now nearly forgotten name of Shearer, who nevertheless was probably the real author of pieces often attributed to Hepplewhite, with whom he seems ultimately to have been connected. His "horse shoe" dining-table, the plan of which "in repose" (as one may say) is the segment of a circle, but which extends, with unfolding legs, into a complete half circle, is a form of table both picturesque and practical; the guests sat round the outer circumference and were served with great convenience from the inner one, which certainly suggests an economy of labour in waiting. A "scren writing-table," which serves at once as a fire-scren and a writing table, and which is said to be especially and solely Shearer's, is another piece of furniture both practical and elegant; the scren is formed by the upright cupboard just deep enough to contain pigeon-holes for paper, supported on two pairs of widely spread legs; the door enclosing the pigeon-hole portion lets down, with metal holdfasts, to form the writing-desk; the portion below has folding doors with oval mirrors in them; altogether a most interesting device in furniture.

The *Berliner-Architekturwelt* contains illustrations of the building for the "Landesversicherungsanstalt" (the Germans certainly have a genius for coining long words!), which we take to mean "Lands Insurance Institute," at Berlin, by Herr Messel, which has a certain character of a somewhat mechanical kind; the exterior consists of a row of perfectly plain narrow brick piers running from ground line to eaves, with the windows recessed between them, and panels between the head of one window and the sill of the next filled up with symbolical carved hieroglyphic devices. In sharp perspective, as in the first illustration, it looks wretchedly bad, all vertical stripes, but as a business building there is a character about it, and some of the detail seems to be good. The Stephanus-Kirche in Prinz-Alten-Strasse, Berlin, by Herr Bückner, is "a mighty mass of brick" with an immense high-pitched roof over it; the interior, with its solid brick piers and mouldings, is more satisfactory than the exterior, which to English eyes seems hard and unsympathetic to a degree. Herr Bruno Schmitz's warehouse building, No. 167, Friedrichstrasse is bold and clever enough in treatment, with its immense multilined windows, on a segmental plan, filling up the greater part of the height and the balustraded gallery over them; it presents a kind of architectural scheme which, with a different kind of detail, is suggestive for the architectural treatment of a city warehouse. Some interiors of rooms designed by various architects, and forming part of the A. S. Ball exhibition at Berlin (whatever that is), show meritorious suggestions in decorative treatment.

The *Architektonische Rundschau* contains nothing worth special comment, except that it includes illustrations of interiors and exteriors of the new building for the Finance Minister at Stuttgart, which, however, it is impossible to admire. A doctor's house in the Margaretenstrasse, Berlin, designed by Herr Dybwad, of Leipzig, is refined in its classic style, and at all events keeps clear of eccentricity. We may again ask when the so-called "Rundschau" is going to include anything by an English architect.

In the *Antiquary* Captain Purchas writes an article on the Chandos portrait of Shakespeare, in comparison with the Droeshout and other extant portraits. He goes very carefully into differences of detail in these, but only with the result that it is impossible to conclude which comes nearest to being the likeness of Shakespeare. The Chandos is a more pleasing and more intellectual head than the others; on the other hand, they all have a certain general resemblance in the character of the physiognomy, and the Chandos differs from them a good deal. The Stratford bust has the same general character as the majority of the others, but it is a clumsily executed affair, and we may feel pretty sure that Shakespeare's mouth and expression, at all events, were not like that. Mr. Abell continues his interesting article on "The Other End of Watling Street."

The *National Review* contains some "Candid Impressions of England" by "A German Resident," which are a good deal more than

candid, being in fact filled with a spirit of hate and contempt, which does not sit very well upon an alien who admits that he has been treated in England; but which nevertheless is better read by Englishmen of all professions to consider how much truth there may be at bottom of them. There is certainly some truth which ought to cause us to reflect seriously. A good many of the subjects touched upon outside of our special province, but one of points we may refer to. To quote one passage:

"Though your workers are now earning high wages I observe that they do not use their money well. Instead of spending it upon their homes, and paying high rents, or buying better food, or saving for bad times, it goes too often to the bookmaker or the public-house, and yet you will hear these men complain that they are not provided with better houses by the municipality of the State. They are allowed to travel on railways at a price which does not pay the companies, by a special law made in favour of their class, yet they seem to think that they ought to pay nothing for their journeys. They actually expect everything to be given to them, and themselves to give nothing. We in Germany have no free education, but then we compel our men in return to serve in the army, so that there is no injustice in the arrangement. In England, however, you make one quarter of the State pay for the education of the children of the other three-quarters, as well as the cost of their own children. You are even getting ready, I see, to feed the children of the poor, and to suppose you will clothe them as well, winding up by maintaining their parents. In fact, you seem bent upon producing a nation of degenerate paupers, not of sturdy men."

In regard to the administration of our towns, our German critic observes that it is impossible to find out who is responsible for what is done or left undone; "the maximum of money expended for the minimum of effect by a host of 'jarring authorities.'" Is not this too true? In Germany the administration of our towns is regarded as a matter of business and not a matter of politics. We have a host of experts, salaried and responsible, at the head of our towns, instead of your extraordinary collection of elected authorities, so that you know whom to blame if matters go wrong. Then he touches on a point we have often referred to—municipal debt. "The first principle of sound business is sound accountability; but in your towns, with their 450,000,000 £ debt, you have not even got that." The writer speaks with respect of our management in India; but that, he says, is because we send our best and strongest men there, but we do not allow the best and strongest to rule at home. There is not also too much truth in that. The writer is insolent and offensive to his towns, as only a German, perhaps, can be; but it may be worth while to take account of what he says. It seems a pity, however, that the Germans cannot have an equally "candid" lesson in one of their own magazines, on their own shortcomings as viewed with English eyes; but that is out of the question, for no decent English writer would have the bad taste and ill manners to write in such a strain about Germany in a German publication. One wonders what would be said of him in Germany if he did!

Temple Bar contains a thoughtful article by Mr. Benjamin Taylor on "The Housing Question," taking the line that this is not a subject for a municipal but for private enterprise. A municipality builds under certain restrictions, written or understood, and does not provide for the poorest class. A private builder can provide for either a millionaire or a scavenger. Then the law says "that the municipality must re-house all the people in unwholesome when a slum is demolished, but then the demolished slum is always, or nearly always, very much more populated—overcrowded—than the new buildings are allowed to be. The excess must go somewhere else, but the law does not say who and what the excess is. In point of fact, a municipality does not and cannot re-house more than a fraction of the people it displaces." And in regard to the lowest class, the vicious class, the opinion of Mr. Fry, the chief sanitary inspector of Glasgow, is quoted that it was useless to build houses where such people could dwell as citizens with citizens' rights and privileges:—

"His solution of the problem was to place all vicious, incorrigible, and known non-rent-paying persons in reformatories, or working colonies, where work must be done; that they should be kept there until a commission is satisfied that a reasonable prospect of reformation has set in; that the cost of these reformatories should be partially maintained by government and partially by the communities utilising them; and that the dens which these persons at present inhabit should be if found insanitary, closed against human habitation, or made sanitary and wholesome for corrigible, decent citizens, who were not prepared to grant these powers, and pay part of the cost, then he saw no other reasonable way of dealing with these people than by closing the slums they at present inhabit, and

all proprietors to co-operate with the municipal authorities to make it extremely difficult, if not impossible, for them to retain a footing in the city."

Taylor adds that "the more one thinks of the view of the treatment of the worthless and shiftless unit of the population the more one is convinced that it seems."

The *Revue des Deux Mondes* contains a very interesting and thoughtful article by the eminent French critic M. Robert de la Sizeranne, "La Geste Moderne aux Salons de 1905," written more especially in relation to the sculpture of the year, and is an attempt to suggest a possible modern element in the manner of regarding and treating the human figure in sculpture. This is at all events a serious and thoughtful article, and well worth attention both of artists and art-critics.

The *Century* contains several articles of interest to our readers. Mr. Gilbert H. Grosvenor, under the title "Our Heralds of Cloud and Wind," gives an account of the service methods and some of the experiences of the United States Weather Bureau. Inhabitants of the States have some not infrequent experiences which we never have in England; we know, for instance, what a tornado is, knowledge from which we may be thankful to be preserved. A West Indian hurricane may have a diameter of from 100 to 500 miles; a tornado is measured in feet, and may be from 1,000 ft. across, but against its power, that its range, forests and brick walls are blown down. Some of the photographed examples of the work of tornadoes seem almost incredible.

Whitehead continues his essay on French sculpture, with illustrations of Amboise, Blois, and Chateaux. There is a clever restored picture by Mr. Castaigne of the celebrated painter at Blois occupied by figures of the king and Henri III. Mr. Welch's article on the Piercing of the Simplon is a more practical and scientific one than we usually find in a general magazine, and includes a geological description of the country through which the tunnel was pierced, showing what a variety of different stratifications had to be encountered. Illustrations are given of some of the mural paintings of an American lady artist, Miss Violet Oakley, in the decoration of the new Pennsylvania State Capitol at Harrisburg. They deal principally with the history of Tyndal and his Bible, and, as far as can be judged from black and white reproductions, to be fine work in which decorative and dramatic elements are well combined. Their colour scheme is said to be of a good kind.

In the *Pall Mall Magazine* Mr. Lewis Hind, in an amusing account, "Pictures and the Public," gives a very amusing account, which reads as if it were real, of taking a young City man, who professed no knowledge of art, through a permanent collection at the Guildhall, in order to record his impressions and opinions, some of which are delightfully naïve. Mr. Thegnue did not please him; "he could not tell that sunlight on the man's arm for five minutes" (is it possible that there is something in this criticism?); nor Mr. Arnesby Brown—"there never were cows that colour, and there never was grass that colour"; "these fellows ought to improve on nature." One would suppose that Mr. Hind's friend was a thorough-going "realist," but for the fact that he settled down on Constable, of all people, as the painter the most satisfied him. The policeman on duty also thought Constable's "Showery Weather" very fine, and never got tired of looking at it. But then he on his part thought nobody could appreciate Mr. La Thangue or Mr. Arnesby Brown, "but," he added confidentially, "it isn't everybody who can appreciate Constable." If the account is real, that is very interesting; it all depends on that. The same magazine also unfortunately contains a silly page of what can only be characterized by the vulgar expression "gush" in regard to that much over-rated wax statue of the Virgin, which has risen into an undeserved fame through the mere force of its refusal by the Royal Academy; the kind of article which is resented by editors of popular magazines as being a foolish and popular cry.

The *Creditors' Magazine* contains a historical sketch of "The Ward of Vintury," lying between Cannon-street and the Thames, and described as one of the most interesting of the wards of London, not only on account of its buildings, but because of its rich fund of associations with the past. Mr. MacMichael's important article on "Charing Cross and its immediate Neighbourhood," which aims at clearing the history and associations of this

part of London, has now reached its sixth number, and will we hope eventually appear as a separate publication. Under the title "An African Pompeii" a short description is given of the remains of Timegad. Dr. Japp's article on "Mottos of Noble Houses" touches on a subject of considerable archaeological interest. In *Knowledge* those who are interested in the present tentative efforts at the manufacture of flying-machines will find an interesting description and illustrations of "a bird-like flying-machine," propelled by wings on the same principle and somewhat in the same shape as a bird's wings. The small model of the machine has flown, it appears; whether the large one will be yet to be seen. We doubt if it will fly far, but the experiment may prove a step in advance.

THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A WESTERN COUNTIES meeting of the Association of Municipal and County Engineers was held at the Guildhall, Gloucester, on Saturday, June 3. The members were received and welcomed by the Mayor (Mr. W. Langley Smith) and the City High Sheriff (Mr. Bretherton). The President (Mr. A. T. Davis, M.Inst.C.E., of Shrewsbury) was in the chair, and there were present Messrs. W. Harpur (Cardiff), T. H. Yabbicom (Bristol), Norman Scorgie (Hackney), T. W. A. Hayward (Battersea), J. S. Pickering (Cheltenham), A. D. Greatorex (West Bromwich), Goodyear (Colchester), J. Parker (Hereford), Cook (Nuneaton), and others.

Municipal Works, Gloucester.

Mr. R. Read, A.M.Inst.C.E., City Surveyor, read a paper on the municipal works of the city of Gloucester. He said Gloucester was the most inland port in England, with docks capable of accommodating vessels up to 1,200 tons register. These docks are connected to those at Sharpness, lower down on the estuary of the Severn, by a ship canal, opened in 1827, 16 miles in length without a lock, the distance by the river being 30 miles. The docks at Sharpness could accommodate vessels up to 6,000 tons register, and a large trade was done both there and at Gloucester in corn and timber, salt, and general cargoes.

There could be no doubt that the ancient city owed its existence to the excellent facilities which the river Severn and the watercourses flowing into it afforded for water supply and navigation, while shallow wells sunk in the gravel deposits over the lower lias clay provided an abundant supply of water. As time went on, and these sources became more or less polluted, water was first brought from the outside, from Robinswood Hill, an outlier of the Cotswold about 2 miles south-east of the city, in lead pipes, and in the XVIIth century pumps were erected on the banks of the Severn near Westgate Bridge, worked by a water-wheel, forcing the river water through wooden pipes formed of young elm trees bored out and cut at the ends to spigot and socket joints, the sockets being strengthened with iron bands.

In 1855 the Robinswood Hill supply was in the hands of a company, who had constructed reservoirs there and laid on the water to some of the principal houses by means of cast-iron mains and lead service pipes, and the demand becoming greater than they could supply, the corporation, on the advice of the late Mr. J. F. Bateman, in that year, obtained an Act of Parliament, purchased the company's rights for 18,000*l.*, and also constructed new additional waterworks at Witcombe, 5 miles east of the city, on an escarpment of the Cotswold Hills, and in 1863 the city was supplied from this source by a 12-in. cast-iron main from two impounding reservoirs, having a total capacity of 80,000,000 gallons. The second or lower reservoir was in 1870 enlarged, and a third reservoir constructed, bringing the total capacity of the three reservoirs up to 120,000,000 gallons, which Mr. J. F. Bateman then advised was the limit of the capacity of the watershed of 1,500 acres in a succession of dry years.

The rainfall of the district varied from 20.37 in. in 1892 to 42.37 in. in 1872, and averaged about 30 in. per annum.

The author was appointed surveyor and water engineer in March, 1878, and in 1881, owing to dry seasons, it became necessary to give an intermittent supply owing to the great increase in the population taking the water.

The population was now 50,500 in 11,498 houses, and the rateable value in March 31, 1905, was 216,928*l.*

In 1882 Mr. J. F. Bateman was again consulted in reference to an additional supply of water, and recommended tunnelling for half a mile into the face of the escarpment of the Cotswold Hills at Witcombe, to bring back water which followed the dip of strata in a south-easterly direction towards the Thames Valley. This ingenious scheme had to be abandoned after trial borings had been made, owing to legal and other difficulties.

In 1883, on the author's recommendation, the Corporation installed the Deacon meter system for the detection of waste of water, at a cost of 2,000*l.*, including 20 meters, dividing the city into that number of districts, about 100 additional valves in the distributing mains, and 1,200 outside stop taps to service pipes. The result of the working of the system was that by June, 1884, the consumption of water was reduced from 32 gallons to 16 gallons per head per day, and it was maintained between that and 20 gallons per head per day, on a total population of 55,000, including the outside population supplied.

In 1891, after Mr. Bateman's death, Mr. William Fox, M.Inst.C.E., was consulted, and he, with the author and the late Mr. J. J. Seekings, who was then Mayor, investigated about ten possible schemes for additional water supply, including two from the river Severn, and the one finally adopted, viz., the sinking of a well in the new red sandstone near Newent, 11 miles west of the city.

Accordingly, in January, 1893, a boring with the diamond drill 10 in. diameter was started at Oxenhall, near Newent, and an abundant supply was found which overflowed the surface. The boring was continued by the Corporation to 290 ft., but the landowners, thinking to find coal, arranged with the contractors to continue the boring to a depth of 1,200 ft., but at this new depth the bottom of the Bunter bed of the new red sandstone had not been reached, and the boring was then discontinued. The Corporation deposited plans and applied for an Act of Parliament in November, 1893, the only opposition to the scheme being for clauses in reference to wells in the neighbourhood and to the crossing of the river Severn by the 14-in. main carrying the water to Gloucester. The well, which cost 4,586*l.*, was commenced in October, 1894, and sunk 170 ft. into the new red sandstone, 15 ft. diameter for the first 60 ft., which was lined with 14-in. brickwork, and 12-ft. diameter for the next 90 ft., which was lined with cast-iron cylinders 11 ft. diameter inside, in 5 ft. rings of eight segments each.

At 145 ft. depth out of last ring but one headings were driven, one in a northerly direction and the other in a westerly direction.

These largely increased the supply to the well, and the contractors, Messrs. Arthur Timmins & Sons, of Runcorn, had to pump 1,500,000 gallons per day to enable the men to work in the headings. The northern heading was 117 ft., and the western 145 ft. in length.

While the well was being sunk, the 11 miles of 14-in. main was being laid, and the covered service reservoir constructed by Messrs. Cruwys & Hobrough, of Gloucester and Birmingham, the contractors for this part of the work. The reservoir was at Upleadon, 3 miles from the pumping station, 150 ft. above the top of the well, and 250 ft. above O.D., and contained 600,000 gallons; and in 1901 a second reservoir holding 1,250,000 gallons was added to the above by the same contractors, from the author's designs, in concrete. The water was delivered to Gloucester on July 1, 1896. It was raised from the well into tanks under the engine-house floor by lift pumps 14½ in. diameter, 4 ft. 6 in. stroke, and double-acting force-pumps draw from the tanks and force the water up to the reservoir at Upleadon, from thence it gravitates 8 miles to Gloucester.

The 14-in. main was carried over the western branch of the river Severn on a lattice girder steel bridge, 212 ft. span carried on screw pile abutments, the latter being used to overcome the opposition of the county authorities, who feared damage to the foundations to Telford's beautiful elliptical stone arched bridge which was close by.

The engines, pumps, and boilers, which were capable of raising 30,000 gallons per hour, were constructed and erected by Messrs. Summers & Scott, engineers, of Gloucester, who were now putting in larger pumps in consequence of the severe drought of 1904, necessitating both engines working night and day for three months; the larger pumps would give a stand-by under all conditions of the rainfall which affect

the Witcombe impounding reservoirs. The engines were arranged clear of the well, so that either lift pump could be lifted out with its rising main by simply disconnecting the pump rods from the bell crank lever. The engines, pumps, and boilers cost 5,416*l*. The pumping-station, built in red brick and forest stone dressings, consisting of engine-house, 60 ft. by 30 ft., boiler-house, workshop, etc., cost 3,766*l*. The total cost of the scheme was 45,000*l*.

In 1901 considerable trouble was experienced at the Witcombe reservoirs with the growth of water plants of the *Carex* and *Nitella* group. These weeds grow at the bottom of the reservoirs, wherever light penetrates, and at a very rapid rate, especially during the summer months, when the temperature in the air was over 60 degrees F., and at certain stages of their growth they imparted a fishy taste to the water, and although this was in no way injurious to health, it was very unpleasant to the taste and smell, especially when the water was heated. In order to overcome this difficulty, the author installed, in October, 1901, a battery of ten Bell Brothers' mechanical filters, at a cost of 5,000*l*., or about one-quarter of the total which would have been necessary to establish ordinary sand filters at the reservoirs, which would have necessitated a loss of 50 ft. of head in the main going to the city. The Bell filters being continuous in action only created a loss of 2 lb. pressure between the inlet and the outlet of the filter. They consisted of ten steel drums, each containing about seven tons of Leighton Buzzard sand, through which the water was passed. The filters were washed out three times per week by reversing the flow of the water to each cylinder in succession; they could be used with or without chemicals, but from one-tenth to one grain of sulphate of alumina per gallon greatly facilitated the filtration, the result being that the water was sent to the city clear, bright, and in perfect condition. The filters acted both bacteriologically and chemically. Mechanical filters had been in use in America for filtering the water from lakes and rivers from which American towns were supplied. The Bell filter was a very great improvement on the American filters, inasmuch as, in addition to reversing the direction of the water through the filters for cleansing purposes, while this was going on stirring arms were made to revolve by means of an oil engine, shafting and bevel-gearing attached to the outside of the filters, so that it was thoroughly washed by the reverse current of water, and it was this method of stirring up the sand which was the great point in the success of cleaning out the filters, as, without the stirring, the current of water was apt to take a direct course between the inlet and the outlet of the drums, without greatly disturbing the whole of the sand. These filters had now been at work for three and a half years, and had made the Witcombe water potable during the hot months of the year, when, in old times, it had frequently to be shut off from the city.

In 1852, under the powers of the 1848 Act, the city was entirely re-sewered in a very thorough and efficient manner by Messrs. Rammel & Lister, civil engineers, the contractor being Mr. Guest, and provision was made in the sewers then laid down for their future extension to near the present area of the city. They consisted of two main outfall sewers, one draining the northern portion and the other the southern portion of the city, both converging at the city quay, and in 1852 they discharged by a single outfall into the river at 17 ft. above O.D. Each sewer was egg-shaped, 4 ft. 6 in. by 3 ft. diameter, and the outfall was a 30-in. iron pipe until 1886, when the author constructed the new quay wall, 200 yds. in length, and took the opportunity that work afforded to give each sewer a separate outfall, thus giving great relief to the sewers in heavy weather.

They had had to adopt the "Model" by-laws as they stood, including the so-called intercepting trap, which the author had consistently opposed since it was first adopted by the Local Government Board, and as long as this absurd and unscientific obstruction was obliged to be introduced into every house drain so long would the question of the ventilation of sewers be an unsolved problem.

On the extension in 1900 the system was further added to by 6,879 yds. of pipe sewers, ranging from 18 in. to 9 in. diameter, at a cost of 6,000*l*., bringing the total length of sewers in the city up to 41 miles 45 yds. The two

large outfall sewers, 4 ft. 6 in. by 3 ft. diameter, had gradients of 1 in 240 and 1 in 480, respectively, for the first 1,000 yds. from the outfall, and the pipe sewers had generally very good gradients, there being an average fall on the surface of the ground of about 30 ft. to the mile. The sewers were all on the combined system, and for some years they suffered from periodical flooding arising from the three natural water-courses which in heavy weather brought a lot of water from the outside area into the city, the Tywyer having a gathering ground of 1,593 acres and the Subbrook 1,963 acres outside the city, and in times of heavy rainfall the covered portions of these brooks through the city were surcharged, and the flood-water overflowed into the sewers, causing great damage and inconvenience. These floods generally occurred at intervals of from five to six years, and on each occasion the surveyor had to report upon the matter and obstructions were removed.

The floods of the river Severn which occasionally occurred were beyond the control of the Corporation, as the river drained an area of 3,700 sq. miles above Gloucester, but they had little or no effect upon the city, as the flooding only takes place in the immediate neighbourhood of the quay, as far as the city itself was concerned, but the two channels of the river became one during a flood, and Alney Island was submerged.

There was a weir in the western channel of the river just below the upper parting at Maise-moore, and another in the eastern channel at Llanthony, 900 yds. below the Gloucester quay, and these hold up the water in the eastern channel to its lowest summer level, 20·53 ft. the invert of the sewer outfall being 17 ft. above O.D., or 3 ft. 6 in. below lowest summer level. No nuisance, however, had ever been known to arise from this fact, but the Local Government Board were pressing them to discharge the sewage into the western channel below the weir so as to get a free outfall; the low water-level of the western channel was only 1 ft. lower than the invert of the sewer, and the distance between the two channels was 770 yds., therefore this could only be effected by pumping from 3,000,000 to 6,000,000 gallons of sewage per day, and in time of flood the pumps would be drowned. When the extension of the city in 1900 was granted the Local Government Board made the Corporation promise to consider this question, but they were under no legal liability to carry out the suggestions, as Gloucester was on the tidal portion of the river, and at low water the amount passing over the weir was three hundred times more than the dry weather flow of the sewers.

From the report of the Medical Officer of Health for 1904 the death-rate of the city was 14·8 per thousand, and the zymotic death-rate 1·7 per thousand.

The Corporation depot, constructed in 1896, on 1½ acres of land belonging to the Corporation, contained stabling for thirty horses, cart sheds, steam-roller sheds, mess-rooms for the men, blacksmiths', carpenters', plumbers', and masons' shops, house for general foreman and horse-keeper, general stores, offices, etc. The cost of the whole was 7,000*l*.

The excess of expenditure over income on the baths was 1,058*l*. 14*s*. 7*d*., or about equal to a 1½*d*. rate. The parks and spa pleasure grounds were established in 1861 under a trust deed vesting them in the Corporation, and since then a recreation ground of two acres had been established at Kingsholm in a very populous part of the city; also the Priory recreation ground of 9 acres, and one at Saintbridge, acquired under the extension order of 6 acres.

The new infectious diseases hospitals at Over, which were opened in 1903, provided three ward pavilions giving accommodation for forty beds, and one administrative block. It was situated on about 20 acres of land, which were purchased by the Corporation for this purpose. The buildings, including furnishing and land, cost 26,000*l*., and were designed by Messrs. Waller & Son and Messrs. Medland & Son, Gloucester, as joint architects. The electric light railway was equivalent to 12½ miles of single track inside the city and 2½ miles outside, or a total of 15 miles of single track. Messrs. Alfred Dickinson & Co., of Birmingham, in conjunction with Mr. Robert Hammond, of London, were the consulting engineers for the tramways.

The overhead equipment was fed at every half mile from underground cables laid in cast-iron troughs filled up solid with bitumen,

each feeder pillar being fitted with switch for isolating the length, and with telephonic communicating with the car depot. Overhead trolley wire was of copper "B.W.G.", insulated at every pole, which 40 yds. apart. The total cost of the electric light railway work inside the city 128,436*l*. 13*s*. 7*d*.

Gloucester Electricity Works.

Mr. Walter J. Bache, M.Inst.E.E., Electrical Engineer, read a paper on Gloucester Electricity Works. He said the Gloucester Municipal Electricity Works were authorised by a visional order granted in 1896, in response to an application by the Corporation. The combined electricity works and refuse destructor were designed as one scheme, but owing to delays in obtaining possession of the site, and other causes, the electricity works were run two years before the completion of the refuse destructor.

The ground on which the buildings stood consisted of made soil, and during excavations for the foundations many traces of the Roman occupation were brought to light. The foundations were carried down to the lias clay, which was found at a depth of 11 ft. below the surface. Underneath the concrete pit the contractor encountered a portion of the old bed of the Severn, and two underground watercourses traversed the site diagonally from north-east to south-west, and were separated by a distance of about 30 ft. to 40 ft. A bed of quicksand in the boiler-house and a series of extraordinary pockets or depressions in the clay under the refuse destructor and the chimney stack added to the builder's difficulties, and called for special methods of construction.

The buildings were of brick, with stone dressings, and consisted of two large bays of the boiler-house and engine-room respectively, a small bay containing the test-room and switch room, with the battery-room over, and a well arranged suite of offices and stores.

The refuse destructor was placed at a right angle to the boiler-house, and between the latter and the chimney-stack.

The lighting sets consisted of one 250-I.H. compound, two crank Belliss engines directly coupled to two 75-kilowatt Silvertown dynamos of inverted horseshoe type, one 500-I.H. triple expansion three crank Belliss engine coupled to two 150-kilowatt Silvertown dynamos of the same type as the smaller set, and one 500-I.H.P. triple expansion three-crank Will engine directly coupled to two 150-kilowatt Mather & Platt four-pole dynamos.

The refuse destructor consisted of two "twin" cells of "Heenan" type, each with grate area of 66 sq. ft. per cell. The Babcock boilers were placed above the cells, the combustion chambers intervening. Each boiler cell was designed to deal with 25 tons of refuse per day, but the quantity dealt with often exceeded 30 tons per day.

In the discussion which followed, President proposed a vote of thanks to the authors of the two papers. He congratulated Mr. Read on the substantial reduction in water consumption as a result of the introduction of the Deacon meter. He held different opinions from Mr. Read on the question of intercepting trap.

Mr. A. D. Grestorex (West Bromwich), seconded, thought it would be better to have some different system of collection than putting of refuse in the street.

Mr. Scorgie (Hackney) held a different opinion from Mr. Read as to the use of intercepting traps. The duty of the householder was to ventilate his own drains; the duty of authority was to ventilate the sewers, and did not think they should endeavour to shift their duty and get some one else to do what they had a statutory obligation to do.

Mr. Cotterill (Bristol) mentioned that at Newport (Mon.) they had successfully dealt with the growth of weeds by the addition of the water of cupric sulphate, which he thought a rather risky experiment. The effect had been entirely to clear the reservoir and mains and to save the town a sum of over 2,000*l*.

Mr. Crump (Hinckley), Mr. Willoughby (Pontypridd), Mr. Pickering (Cheltenham) also took part in the discussion.

Mr. A. J. Dickinson (Birmingham) contended that in the case of properly-laid sewers an intercepting trap was a mistake, as it impeded the flow of the sewage.

Mr. T. W. A. Havvard (Battersea) was of opinion that with properly-laid sewers

is a great evil to put in intercepting traps in the block what was very often the small fall in the house drains.

Mr. Bell (Swansea) and Mr. Gettings (Teignmouth) having spoken,

Mr. Read, in reply, said he had always objected in principle to the intercepting trap. It was claimed for it that it cut the sewer gas from the house. It could not do anything of the kind. It simply provided an obstruction to the drains which paralysed their action, and set up a septic action in all the sewage which had to go through the sewer. Whatever might fall, the sewage dribbled in at one end of the trap and dribbled out at the other end, and the solid behind.

During the day the President and members visited the Gloucester Railway Carriage and Wagon Company's works, the tramway depot, and the electricity and destructor works, and dined together at the Bell Hotel.

FIRE PROTECTION FOR LONDON.

Mr. W. E. RILEY, the Architect to the London County Council, continued his evidence in support of the Bill on Friday, last week.

Cross-examined by Mr. Pembroke Stephens, C.C. for the Royal Institute of British Architects, he considered that all the powers sought by the London County Council in the Bill were necessary and in the public interest. It was the intention of the Council to make the retrospective powers general. In 208 of the principal streets of London there were 1,136 buildings between 50 and 60 ft. in height; there were 298 of the same streets over 60 ft. in height. That represented the total number that would come under the high buildings clause—the retrospective high building clause—in 208 of the principal streets of London. The principal streets represented a proportion of about 10 per cent. of the whole of the streets to which the legislation would apply.

Mr. Pembroke Stephens: In framing the Bill, was regard had to whether the property was in a reasonably good position or had dangerous surroundings?

Witness: There has been no regard either to the situation or the class of property in framing the clause.

Mr. Pembroke Stephens: You did not take account whether the property was situated in an easy reach of assistance in case of fire, whether it was a distance from any means of escape?

Witness: No, I think that has been left out from the consideration. In reply to further questions witness said that it was not intended to deal with buildings dealt with under another Bill.

Mr. Pembroke Stephens suggested that the Bill left it to the County Council to prescribe that they thought fit or "reasonable."

Witness said that that was so, but an owner would go to arbitration if he did not agree.

Mr. Pembroke Stephens: "Where is there any direction in your Bill to the arbitrator as to what there is in your own previous Bill to what is to be required is what is reasonable in the circumstances of the case?"

Witness: It gives him absolute power.

Mr. Pembroke Stephens: In other words you limit a section, with a reference to an arbitrator in any case, to do what is reasonable according to the circumstances of the case, and in another words, such words, is an equally satisfactory mode of arbitration?

Witness did not think it would influence the matter materially.

Mr. Pembroke Stephens: It would be the same in the view of the County Council, but the arbitrator might look at it from a different point of view.

Witness could not agree. Replying to other questions put by Mr. Stephens witness said that that portion of the Bill dealing with the prevention of fire referred to the interior of a house. "The construction and planning and the arrangements as belonged to an architect."

On Monday and Tuesday Mr. Riley was cross-examined by Counsel for various reasons.

Replying to Mr. Telbot (for the Institute of Architects and the Industrial Dwellings Co.) witness said that he did not think a competent architect would have any difficulty in understanding what the new requirements were. The proposals of the Bill were necessary now because London was far more built on than in 1844. In regard to industrial dwellings he thought that in such buildings there was very

little danger of fire, besides there were usually many staircases in such blocks.

Captain Hamilton, the Chief of the Fire Brigade, was then called, and, examined by Mr. Bushe, K.C., said that he considered the reduction in height from 60 to 50 ft. in buildings where special means of escape should be provided as very important. It was a most difficult matter to rescue persons from the upper floors of a building over 50 ft. in height. Protecting shop fronts were a very great danger. When a fire started in the shop it burst through the roof, and so cut off the escape of persons in the other parts of the house.

THE INSTITUTE OF SANITARY ENGINEERS, LIMITED.

VENTILATION OF SEWERS AND DRAINS.

A SESSIONAL meeting of this Institute was held on April 19 at No. 19, Bloomsbury-square, W.C., when Mr. E. R. Palmer, Vice-President, read a paper on "The Ventilating, Flushing, and Cleansing of Sewers and Drains."

He said that the sewers referred to in his paper belonged to the type known as the separate system. It could scarcely be said that the problem, which had sorely vexed sanitary engineers for the past forty years, was as yet satisfactorily solved. It had been a fruitful source of controversy for years, and many systems had been brought to the notice of municipal engineers. He assumed that it was the aim of every engineer to construct his sewers with impervious materials and watertight joints, also making provision for their ventilation. The sewers might be constructed of brickwork, concrete pipes, or stoneware pipes. After the necessary depth of excavation had been made for constructing new sewers, very great care should be taken to see that a proper foundation was secured before laying in the cement concrete, for without a good foundation the very best efforts on behalf of the engineer were frustrated. Should a subsidence of the earth take place, it meant a flaw either in the brick or pipe sewer, for where once a leak was made it went on increasing, with the result that the invert that was once laid true became defective and settled down, forming pockets, which became filled with deposits and caused a nuisance. There were other difficulties that existed in some main sewers. Sometimes the flow was less than 1 ft. per second, and then the sewer became charged with an excess of putrefied organic matter. But in some sewers, he was pleased to say, there was much greater velocity—3 ft. or even 4 ft. per second, where the discharge would, in all probability, prevent putrefaction in the sewer. And, again, there was another important matter to be taken into consideration—that was the length of discharge pipe between the intercepting trap and the sewer, which was often not ventilated, and, owing to the inadequate flush from the water-closets, the sewage was partly decomposed before entering the sewer. This caused the length of pipe to become very foul, and, considering the area and length of such pipes, it helped to increase the impure air in the sewer considerably; the large area of the inner periphery of the sewer also became coated with slime by the rise and fall of the sewage, and this could not be readily prevented, however well constructed such sewers might be.

The author then considered what influence changes of temperature have upon the sewage, and said:—"In summer time the temperature of the flowing sewage would be about 50° F., and the air in the sewer above the sewage would probably range in the course of twenty-four hours between 50° and 65° F. The outer air at ground level during the same period would possibly be between 50° and 80° F. The sewage and the air above same is lower in temperature than the outer air, except at dusk, when the radiation from the surface of the earth reduces the temperature of the air in contact with the ground level. Under these conditions there would be an escape of sewer gas from the open covers. In dry weather the outer air would have a lower percentage of humidity, and would of necessity absorb moisture from the air rising from the sewers. The effect of this would be that the watery vapour rising from the sewers would be charged with organic matter, and, as the density is about half that of dry air at the same temperature, trouble is again caused by the sewer gas rising from the surface covers. The breaking up of fine weather is usually preceded by a fall in barometric pressure, which again

releases the watery vapour from the sewage, which is in a concentrated form, through the surface covers to the outer air, and, the air being then at its greatest capacity for absorbing moisture, it becomes very offensive. It is this watery vapour that ventilation has to deal with. In main and tributary sewers all are more or less contaminated with foul air. Having now mentioned a few of the causes of sewer smells, it would be as well to speak of the cleansing of sewers. Brick sewers should be periodically cleansed by the use of brooms made to suit the shape of the sewers. Where the sewers are of such size to admit the workman to pass through, it should not be a difficult task for him to scrub the sides and invert by these means. Should the sewers be constructed with pipes, then brushes of the same diameter should be drawn through, passing from one manhole to the next and so on; preference is given to a rotary action of the brush for circular pipes. This is obtained by the movement of a wheel preceding the brush. In my opinion, if more care were given to the scrubbing and flushing of sewers, the trouble of sewer smells would be greatly lessened.

We will now pass on and deal with the method of ventilating sewers. It is a common practice to adopt open surface covers level with the road for the inlet of air at intervals ranging from 40 to 100 yards, with tall shafts attached to buildings, trees, etc. The object in view is to induce a current of air in through the surface covers and to pass upwards through the shafts. This often fails to act, and frequently the reverse action takes place. The obnoxious gases are forced out through the surface covers immediately under the noses of the passers by. There are times when, under certain conditions of the wind the air enters at the surface covers and escapes at the outlet of the shafts, which are unfortunately generally fixed close to or attached to a chimney stack, often close to the chimney pots. The foul air would, in all probability, descend the chimney flues, especially if the fire had burnt out in a sleeping compartment, and, the temperature being higher than the outside, what is commonly known as a down draft would be produced. In some cases the shafts are raised above the eaves of the roof, with the result that the foul air is driven by the force of the wind through the laps in the tiles or slates, and frequently into dormer windows, and finally into the upper rooms, in some instances close to the drinking water cisterns. Is it to be wondered at that people often complain of lassitude and loss of energy when awaking in the morning where such evils exist? No wonder the sewer ventilation question becomes acute owing to the number and strength of complaints in various towns.

Having now traversed the subject of sewer smells, let us see what can be done to obviate this nuisance. I will first speak of the brick sewers. I have already dealt with the advantages of having the sewers thoroughly scrubbed. I mention this because if this is carried out as often as it becomes necessary the air in the sewers will be less difficult to deal with. It has been tried over and over again to ventilate sewers by what is known as natural ventilation, but this method has, in my opinion, failed in its object; therefore I am about to introduce another form that is mechanical to assist the natural ventilation. In the first place I must claim your indulgence for introducing proprietary appliances, such as the exhaust fan, fitted into ventilating column, combined with the full bore automatic flushing syphon. This claims to take an important part in the improvement of the ventilation and cleansing of sewers. The height of the column above ground line is at least 30 ft. The top has an ornamental coronet with galvanised wire cover, shaft is 10 in. diameter steel tube. Cast-iron base 18 in. diameter (inside measure), with trunk and flange plate set into concrete. Inside the base of column is fitted an exhaust fan. Access is given by a fitted door and lock. The power for driving the fan is water from the main. By turning on the stop-cock the water sets the fan in motion, and immediately a current of air is drawn from the sewer and forced out at the top of the column. The velocity through a 10-in. tube would be about 20,000 ft. per hour, and the cost for water to produce this would be a halfpenny (supposing water to cost 10d. per 1,000 gallons). This water, after being used for driving the fan, is taken through a pipe connecting fan and flushing tank to supply the water for flushing the sewers without additional cost. These fans may be used where required

for inducing air into sewers; also for ventilating underground conveniences; the water from the fan being taken to the flush cisterns for flushing the urinals.

I should suggest before erecting the ventilating columns that certain alterations were made to the manholes. I have no objections to the surface covers remaining open, provided they have the usual mud bucket attached. But on no account must the air from the sewers pass up through the covers. At the bottom of the manholes should be fixed (just above the benching) an iron-flanged frame secured to wall of manhole with a portable cover. The dip would always be supplied with water from the vapour arising from the sewage and remain smell proof. The object of this would be to confine the flow of air in the sewers and to increase its velocity, so doing away with the resisting force exercised by the cushion of air in the manholes. The method adopted at the present day is to block off the covers by putting in a solid iron plate, and so cause the area of the manholes to be filled with obnoxious gases.

Just imagine what this means when there are some hundreds of such manholes, each probably holding 50 cubic ft. of foul air! Disperse with this, and an improvement is made aiding ventilation. Connexions with the sewers for the purpose of ventilation should be made from the top, whether it is from brick or stoneware pipe sewers. This allows for freer motion of the air; it does not become shut off nor is it likely to be silted at such times when the flow of sewage is great. It is also an advantage in ventilation for the removal of the watery vapour which rises vertically from the wet surfaces of the sewers. For a brick sewer I should recommend a 12-in. glazed stoneware pipe between sewer and ventilating column. As we are now dealing with brick sewers, I should suggest that columns with 10-in. diameter shafts and 18-in. diameter cast-iron bases were fixed at intervals with few exceptions, such as is required for lamp-posts and the lamps fixed thereon; in fact, ventilated lamp-posts without the exhaust fan. But where main sewers intercept at junction of roads, such as open spaces to cross roads, and where gradients are flat, it would be most advantageous to fix the exhaust fans to the ventilating columns with flushing tanks, tributary, or pipe sewers. Should any of these have very sharp gradients, it would be well to fix a light-balanced shield at the junction of main sewer to prevent an excess of air passing through these pipes, and so giving it more than its share of work. It may be considered that if a sewer has a very sharp gradient it must be self-cleansing. This is not found to work out correctly at all times—owing to the sharp gradient the water does not carry the whole of the solids with it, and in consequence bad smells often occur where this is found. This is one of the points where an exhaust fan and column with a flushing tank should be fixed.

If the gradients are of the ordinary kind, and the size of the sewers are, say, 9 in. diameter to 18 in. diameter, I should suggest that 6-in. shafts with 12-in. cast-iron bases as ventilating columns should be fixed to take the position of lamp-posts, possibly with few exceptions. These would require an 8-in. diameter stoneware pipe as connexion between sewer and ventilating column. Although these columns would be at least 30 ft. above the ground level, the lamps may be adjusted at any height required. I do not propose fixing exhaust fans to these columns, but I should suggest fixing exhaust fans with flushing tanks at the following places: where sewers have flat gradients, open spaces at cross roads, junction of sewers and head of sewers. There is no doubt that the wind does exert its power in forcing the gas in different directions in the sewers, but there will be no fear of compression of air in the sewers to force the intercepting trap to house connexions. The columns acting as outlets and inlets will maintain a normal condition of the air in the sewers. The exhaust fans in columns under all circumstances will keep the air in circulation, fed by the open shafts. It might be said that to allow the air to escape at a point 30 ft. above the ground level would be such as to cause a nuisance. This is not so. The air space around the outlet of the column soon neutralises the foul air, and does not become a nuisance.

I must now touch only briefly on flushing sewers and house drains. This is a very important factor for cleansing purposes. It would not be fair to any system of ventilation to exclude flushing. Automatic siphons for sewers that will work with certainty (these are

to be obtained and set to operate at certain intervals) will help considerably to remove deposits, cleanse above the ordinary lines of sewage flow, and exert influence on the air in sewers. All siphons should have a full bore throughout. These give increased velocity, so that the benefit of the flush may be carried out for a considerable distance through the sewers.

If house drains were flushed twice every day from a 30-gallon automatic tank fixed at the head of the drain we should not hear of the many complaints providing the drains and ventilation are good. There is no doubt, without flushing, the intercepting trap is the culprit. It stops the flow of sewage to a great extent; some advocate its removal.

The question is, are the drains sound, and would it be safe to disperse with it? Some few years since many engineers met in London to discuss this subject, presided over by Sir A. Binney. It was finally resolved by the local authorities that the intercepting trap must remain.

In conclusion, there is no doubt that the responsibility rests upon the shoulders of every local authority to see that their sewers are kept in such a condition as that they shall 'not be a nuisance or injurious to health.' The Public Health Act, 1875, contains the following section:

—19. Every local authority shall cause the sewers belonging to them to be constructed, covered, ventilated, and kept so as not to be a nuisance or injurious to health, and to be properly cleansed and emptied."

Examinations.

Examinations in Practical Sanitary Science were held in London, Liverpool, and Bristol on March 24 and 25, and the undermentioned were successful in passing:—Messrs. J. C. Nicholls, Olney, Bucks; J. D. Mannors, Paddington; F. E. Brown, Gravesend; F. J. Atkinson, Manchester; J. L. Pencock, Knutsford, Cheshire; R. Rigby, Hr. Broughton, Manchester; W. Clark, Mitcham; W. Spurr, Batley, Yorks; W. F. Tudor, Maesteg, Glam.; M. E. W. Fitzgerald, Warminster, Wilts. The following passed the Studentship Examination:—M. F. Mann, Clifton Hill, Exeter.

THE ARCHITECTURAL ASSOCIATION SUMMER VISITS:

II.—"PARKWOOD," HENLEY-ON-THAMES.

In all its aspects the second visit of the session, to Henley, on Saturday, 3rd inst., was a pronounced success. "Parkwood" is a recently-finished mansion having accessory buildings comprising stables, motor-house, lodge, kennels, electric plant and laundry, so that the party of members of the Architectural Association who were shown over the establishment by the architect, Mr. Wm. Flockhart, were fortunate in seeing a well-equipped modern country residence possessing at the same time much architectural merit.

The house stands upon an elevated site some 450 ft. above sea-level, and the ground formerly held a thickly grown wood, but a judicious clearance of the oak and beech timber has given a site with charming views and an excellent setting to the main building. The exterior has distinct originality in the design of its parts, but is crowded with features with variety in form and material. This variety produces a somewhat busy effect which would become confusion but for the sobering influence of the severe lines of the roof.

Broadly considered, "Parkwood" is a rough-cast house with tiled roofs, while chimneys and other prominent features are built in red bricks of various tones and sizes, all of local manufacture. The glazed brick plinth, also made in the district, has good texture and colour. But the fronts bristle with quaint affectations, principally fashioned in roofing tiles, which receive abrupt setting in the rough-cast field.

The plan is excellent and well arranged to meet the demands of the site, but it is one, perhaps, more suited to a larger dwelling, for there is a smallness and want of breadth in almost all the parts of the interior. The dignity sought after would rise with greater force if the scheme had been expanded. The main entrance on the north is easily controlled from the servants' quarters on the west, and is convenient to the lavatory and cloak-room, which again are adjacent to the billiard-room, a piece of sound planning. The feature of the interior is the large staircase-hall facing south, at the ends of which the dining and drawing rooms are placed. Skilful use is made of a

mezzanine, in which a number of bedrooms are arranged. The proportions of the rooms are carefully studied, and the principal apartments are found to possess varying heights. The billiard-room is particularly satisfactory in this respect; it is further enhanced by high faced walls and a good plaster vaulted ceiling.

Throughout the house may be seen excellent wood fittings with furniture of character. The success is one that has led to the thought that it is as necessary for the architect to produce the frames and background to evolve the design of the independent objects of use. The large sliding doors of the drawing room are discordant, but illustrate an instance where the architect is compelled to subordinate his design to the advanced ideas of a client. Colour, again, is one of the charms of the interior, and not the least interesting of many schemes are the distemper tints on the rough plastered walls of the minor parts, useful and in some ways novel feature is a large attic, fitted up as one long gallery, games and other forms of recreation.

The immediate surroundings of the house have naturally received due consideration, special effort has been made in laying out an Italian garden on the west front and in flights of steps leading down to it. Here rough cast walls and brick copings are used in supplying the desirable materials between house and garden. Several valuable antiques are set in prominent position in the lay-out. It is instructive to observe the state of luxuriance reached in these gardens in the short period which has elapsed since formation.

The rough-cast entrance-lodge bears impress of the same intellect to be found in the house, and most of the playful fancies echoed here. There is, however, much to admire, and the blue-tiled Dutch treatment of the walls of the sitting-room, occupied by the owner during the building of the mansion is most skilful and satisfying.

In the stable and motor-house a contrasting manner is to be seen. Here the walls are in brick, while some picturesque roofing adds the excellence of a good design.

What proved to be a thoroughly enjoyable and instructive afternoon was in great measure enhanced by the courtesy and hospitality of the owner, Mr. Charles Henry, who is congratulated upon having secured a delightful architectural home.

THE LONDON COUNTY COUNCIL.

The ordinary weekly meeting of the London County Council was held on Tuesday in County Hall, Spring-gardens, Mr. E. A. Wall, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to:—Camberwell Borough Council 14,787, for erection of baths; the Greenwich Council 51,154, for poor law purposes; Hammersmith Borough Council 8,153, for street improvement; Poplar Borough Council 9,960, for electric lighting purposes and 10,212, for public works; Stepney Borough Council 1,650, for land for street market and public gas; Woolwich Borough Council 10,221, for improvement and 2,712, for brick making and buildings and repayment of part of loan dust destructor.

Insurance of Property Against Fire.—Finance Committee submitted for the approval of the Council a scheme for the creation of an insurance fund to provide for loss or damage caused by fire in respect of the property of the Council. With regard to the amount of which the Council should undertake, the committee express the opinion that at the whole Council should not undertake the whole of the risks of its various properties. Some of the risks are very large in amount, and the committee think that until a larger fund than the Council at present possesses (about 58,000) has accumulated, they would be well advised not to undertake more than a certain proportion of the larger risks. The scheme, accordingly, provides that the fund shall take the amount of all risks up to and including 10,000, and that with regard to risks exceeding 10,000 the fund shall take the sum of 10,000, and half of the balance of such risks, but not exceeding 25,000, in respect of any one risk.

Mr. Bruce explained that for some years it had been evident that the premiums demanded by insurance companies for the Council's property were far higher than they should be.

The report was adopted.

Schools.—The Education Committee recommended and it was agreed—

(a) That the necessary steps prescribed by section 8 of the Education Act, 1902, be taken with the view of giving public notice of the Council's intention to erect a permanent school, with accommodation for about 100 children, on land adjoining the "Southfield" school and that the Board of Education be informed of this proposal.

(b) That the necessary steps prescribed by section 9 of the Education Act, 1902, be taken with the view of giving public notice of the Council's intention to acquire a site for future school requirements in Merion-road (Wandsworth), between the "Southfield" school and the West-hill school, and that the Board of Education be informed of this proposal.

Light and Air.—**Central School of Arts and Crafts.**—The following recommendation of the Committee was agreed to—

That the estimate of 1,150*l.*, submitted by the Finance Committee, in respect of the settlement of the claims of the trustees of the Strickland estate for compensation amounting to 1,000*l.* for loss of rights of light and air, consequent upon the erection of the L.C.C. Central School of Arts and Crafts, and the surveyor's fee and other out-of-pocket costs in connection with the matter, be approved.

Appointment of Lecturer.—**L.C.C. School of Building.**—The following recommendation of the Committee was also agreed to—

That Professor Beresford Pite, F.R.I.B.A., be appointed director of architectural instruction and lecturer on architectural subjects at the L.C.C. School of Building.

The Hampstead-road Improvement.—The Improvements Committee brought up a further report with reference to the scheme for the widening of the Hampstead-road and the method of dealing with the Old King's Head public-house at the corner of Hampstead and Euston roads, the site of which it requires in connection with the improvement.

Some time back, when the Committee suggested a scheme of reinstatement in order to save the expenditure of some 30,000*l.*, in buying up the licence and abandoning it, the report was referred back with instructions to the magistrates. The Committee now recommended that no further steps be taken for the acquisition of the Old King's Head until after the next licensing sessions, and that a representation should be made to the justices with a view to the renewal of the licence being refused.

Sir W. Collins moved as an amendment that the recommendation be referred back to the Committee with instructions at once to serve the remaining notices to treat and to report as soon as possible whether it is practicable to proceed with the licence of the Old King's Head public-house through the justices under the Licensing Act.

Mr. McKinnon Wood seconded the amendment.

After discussion, the amendment was carried by a large majority.

On the amendment being put as a substantive motion.

Lord Eliche moved a further amendment to the effect that negotiations should be reopened for the reinstatement of the premises.

Upon a division the amendment was rejected by twenty-four votes to thirty-six.

Sir W. Collins's amendment was then carried as a substantive motion.

New Tramways.—The Highways Committee recommended that an expenditure on capital account of 287,000*l.* should be sanctioned in respect of the construction or reconstruction and the equipment for the underground conduit system of electrical traction of the following tramways—(1) From Camberwell-green *via* Banbury-hill and Loddish-lane to the Crystal Palace-road; (2) from the terminus of the "Islington" tramway in Loddish-lane *via* London-road to Dartmouth-road, Forest-hill; (3) from Grove-vale *via* Goose-green and Archam-rye to Stuart-road, Peckham; (4) from the existing tramways in New-cross-road *via* Lewisham High-road, Loampit-vale, to Rushey-green; (5) from the terminus of the existing tramways in Trafalgar-road, Greenwich, *via* Blackwall-lane to Blackwall Tunnel.

The recommendation of the Committee was, after a short discussion, adopted.

Denmark-hill Bridge.—On the recommendation of the Bridges Committee, the following recommendation was agreed to—

That the estimate of 7,000*l.*, submitted by the Finance Committee, in respect of the reconstruction of a bridge carrying Denmark-hill over the London, Brighton and South Coast Railway and the South-Eastern and Chatham Railway, be approved.

Housing.—The Housing of the Working Classes Committee recommended, and it was agreed—That the estimate of expenditure on capital account of 51,500*l.*, submitted by the Finance Committee, be approved, in respect of the erection of five blocks of dwellings, including

all incidental expenses, on the Webber-row area comprised in the London (Webber-row area) Improvement Scheme, 1899.

The dwellings will contain accommodation for 1,130 persons in 120 tenements of three rooms, ninety-six tenements of two rooms, four tenements of one room and eighteen cubicles. Four blocks will each contain accommodation for 230 persons, while the fifth block, with a frontage to Waterloo-road, will, in addition to dwelling accommodation for 210 persons, contain ten shops with store-rooms on the ground floor.

White Hart-lane Estate.—**Erection of Sixty Cottages.**—The same Committee reported that the question of the development of the White Hart-lane estate, Wood-green, has engaged their attention for some time past, and after full consideration they were of opinion that the Council should now undertake the erection of an additional number of cottages. Section A of the estate, comprising about 5 acres, has already been developed, while roads have been formed and sewers constructed on section B, which has an area of about 15 acres. The Committee were not prepared, however, to advise that the whole of this area should be built over immediately, but asked the Council to sanction the erection of sixty cottages of different types on a part of section B in Spigurnell-road, Waltham-avenue, Gedeney-gardens, and Risley-avenue. In view, however, of the hitherto slow letting of the cottages built upon this estate the Committee thought that the Council would desire them to explain somewhat fully the difficulties which have had to be contended with.

"The Council will remember that when the estate was purchased we reported that the northern portion was not ripe for development, and the purchase thereof was regarded in the light of an investment with a view to meeting future requirements. The southern portion, which is situate within about a mile of three railway stations, and has a considerable frontage to a main-road, and having also the prospect of a tube railway being constructed through it, was rightly regarded as promising for early development, and this view we see no reason to modify. Many of the difficulties so far encountered are such as are incidental to new estates in the early stages of their development, and may be expected to disappear as the work of covering the estate is proceeded with. The slow letting of the first cottages erected on an estate is not a new experience, and cannot be regarded by itself as conclusive evidence that the estate will not eventually prove to be a success. Some of the difficulties encountered are of a temporary character. When the estate was purchased there was a large area of land between the estate and the railway, and it may fairly be inferred that the Council's action has stimulated the development of this land, which was more favourably situated and ripe for building. This estate of about 100 acres has been very rapidly covered, and the work is now nearly completed. The result has been that for the moment building operations have proceeded somewhat in advance of the growth of the population in the district, and this must have had some prejudicial effect on the letting of the Council's cottages. We consider, however, that the completion of this estate will ultimately have a beneficial effect on the White Hart-lane estate, as it will bring a large population right up to the border of the Council's property, which must thereby become ripe for building than it would otherwise have been. . . . Arrangements have recently been made for acquiring parts of the unoccupied land in allottments. Thirty-seven plots have been staked out for this purpose, and of them twenty-nine have already been let. It is gratifying to know that the letting of the cottages is proceeding more rapidly, and that tenants remain longer in occupation. With regard to the cottages themselves, we have considered whether it is not possible to reduce the cost of construction so as to let cottages on the estate at a lower rental. To this end we instructed the architect to modify the plans of the dwellings, to simplify the specification, and to obtain offers, without bills of quantities, from reliable builders accustomed to erect houses of a similar class, such offers to name the conditions under which the builders were prepared to carry out the work, the work to be executed under the superintendence and to the entire satisfaction of our architect. The result has been eminently satisfactory, and we are able to report that prices have been obtained which are much lower than any before presented to the Council, and will enable the houses to be let at lower rentals. We think that in the first instance the Council should proceed with the erection of twenty-eight first-class or five-roomed cottages, six second-class or four-roomed cottages, and twenty-four third-class or three-roomed cottages, each cottage being also provided with a scullery and the usual conveniences. In respect of these cottages we propose not to adopt either of the usual methods of procedure for getting similar work done—*i.e.*, by contract in the ordinary way or through the agency of the Works Committee—but to select Mr. G. B. Palford to erect the cottages at the prices he has quoted for each type—*viz.*, first-class cottage 228*l.*, or 235*l.* for each corner cottage; second-class cottage 182*l.*, or 188*l.* for each corner cottage; third-class cottage 153*l.*, or 158*l.* for each corner cottage. Mr. Palford stipulates that payment shall be made to him every fortnight to the extent of 80 per cent. of the value of the work done, that 15 per cent. shall be paid on the completion of each house, and that the remaining 5 per cent. shall be paid within one month after the completion thereof. . . ."

Recommendations giving effect to this were agreed to after discussion and the defeat of two amendments to refer the matter back for further consideration.

Erection of an Addition to the Balcony of the

Savoy Hotel.—The Building Act Committee considered as follows—

"We have considered an application submitted by Messrs. Collett & Hanks, on behalf of the Savoy Hotel Company, for consent to the erection of an addition to the balcony on the embankment front of the Savoy Hotel. The proposed addition, which will extend along nearly the whole length of the front of the hotel, will project a distance of 6 ft. and will be about 170 ft. long. Having regard to the fact that the road between the hotel and the railings of the embankment gardens is not much used as a public thoroughfare, we think that the Council may allow the proposed addition. . . ."

Mr. Howell J. Williams moved that the matter be referred back. He had calculated that the sanction meant a free gift to the hotel of 6,300*l.*, and it was undesirable to allow such an addition to be made. This was the first time that the Building Act Committee had given sanction to the provision of a balcony projecting along the entire front of a building.

Mr. Straus seconded, and, after discussion, the amendment was carried, Mr. Burns remarking that the proposal was a preposterous and dangerous one.

Width of Way and Line of Frontage.—The same Committee recommended that consent be not given to the erection of an iron and glass covered way in front of "Normanhurst," Priory-road, West Hampstead, on the application of Messrs. Baker & May for Mr. F. P. Scholte, although the application was supported by the local authority.

Mr. E. Smith moved, and Mr. Hanhart seconded, that the application be granted, but, after discussion, the recommendation of the Committee was carried.

Reconstruction of Tramways in Battersea Park-road.—**Alterations to Bridge.**—The following recommendation of the Bridges Committee was carried—That expenditure on capital account not exceeding 1,350*l.* be sanctioned in respect of the reconstruction of a portion of the bridge carrying Battersea Park-road over the lines of the London, Brighton, and South Coast and the South-Eastern and Chatham Railway Companies.

Ground Plan of London.—**Ownership Section.**—It was agreed to complete the ownership section of the ground plan of London at a cost of 5,400*l.*

Indication of Houses of Historical Interest.—It was agreed that the undermentioned houses of his' or her interest be commemorated by means of memorial tablets:—(a) No. 64, Duncan-terrace, Islington (Charles Lamb); (b) No. 31, Baker-street, W. (Edward Bulwer Lytton).

Unemployed Workmen Bill.—The following recommendations of the Parliamentary Committee were agreed to—

(a) That the Council is of opinion that, whilst legislation on the subject of the unemployed is urgently needed, it should place the cost on national and not on local funds.

(b) That the Parliamentary Committee be authorised to convene a conference at the County Hall of representatives of the City Corporation, the Metropolitan borough councils and boards of guardians with regard to the Unemployed Workmen Bill introduced into Parliament in the session of 1905.

London Squares.—The same Committee recommended, and it was agreed—

That it be referred to the Parliamentary Committee to prepare a Bill for introduction into Parliament in the session of 1906, with a view to securing that the garden squares and enclosures in London shall remain unbuilt upon.

Highbury Fields.—**Memorial to Islingtonians who Died in the South African War.**—The Parks Committee reported that the Council on March 1, 1904, granted permission to the Council of the Metropolitan Borough of Islington to erect, upon a site on Highbury Fields, a memorial to Islingtonians who lost their lives in the South African war. The permission was subject to the design for the memorial and the inscription to be placed thereon being submitted to and approved by the Council. It is desired that the erection of the memorial may be completed so that it may be unveiled by the Duke of Fife on July 15, 1905. The design is by Mr. Bertram Mackennal, and the Committee have approved the same on behalf of the Council.

Acton Sewage Bill, 1905.—The Parliamentary Committee reported that, after considerable negotiations, an agreement has been arrived at with the promoters of this Bill as follows—

(i.) That the Acton Urban District Council is to pay a differential rate (assessed upon the Middlesex County rate basis) of 3*d.* in excess of the proportion of the county rate levied by the London County Council for main drainage purposes and a capital sum of 27,500*l.* towards the Council's past capital expenditure on main drainage.

(ii.) That the Council is to pay a sum of 27,500*l.* towards the cost of the construction by the Acton Council of the storm-water sewer proposed by the Bill to be constructed.

These terms, in effect, provide that the Acton Council shall make a capital payment and an annual contribution slightly in excess of the amounts payable on the basis of population, whilst the Council's contribution to the cost of the new storm relief works appears to be not in excess of the proportionate benefits which London will receive.

It was agreed that the action taken in withdrawing the petition against the Acton Sewage Bill, 1905, be approved.

Colney Hatch Asylum.—Improvements in ventilation and lighting and improvement in sanitary arrangements at this asylum at a supplemental maintenance estimate of 2,000*l.* were agreed to.

Cannon-street Fire Station.—The Fire Brigade Committee reported that the Works Committee have agreed to undertake the work at the amount of the architect's estimate of 16,000*l.*

Housing.—The Housing of the Working Classes Committee recommended, and it was agreed, that, subject to the estimate submitted by the Finance Committee in respect of the erection of five blocks of working-class dwellings on the Webber-row area, Southwark, being approved, the work of erection be carried out without the intervention of a contractor; and that the working drawings, specification, bills of quantities, and estimate of 33,800*l.* in respect of four blocks, and an addendum bill of 600*l.* applicable to the fifth block, be referred to the Works Committee for the purpose, provision being made for the erection of the fifth block at the same schedule of prices.

Other business was transacted, and after a sitting lasting over eight hours, the Council adjourned for the Whitsuntide recess until July 4.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Erection of a Building on the South-east Side of Warwick-place, Paddington.

Paddington, North.—That the resolution reported to the Council on May 16, 1905, consenting to the erection of a building on the south-east side of Warwick-place, Blomfield-road, Paddington, be rescinded.—Agreed.

Lines of Frontage and Projections.

Hammersmith.—Five houses with shops on a site abutting upon the west side of Aaker-road and south side of Gayford-road, Hammersmith (Mr. J. J. Kelf for Mr. A. Gard).—Consent.

Lewisham.—An addition to a one-story building at the rear of No. 184, Brownhill-road, Cusford, abutting upon St. Fillan's-road (Mr. E. Wright for Mr. H. Aney).—Consent.

Norwood.—Buildings on the western side of Brixton-hill and New Park-road (Messrs. D. Young & Co. for Messrs. F. W. E. Hockey, W. J. Peall, W. T. Key, and R. W. Brading).—Consent.

Hammersmith.—A house on the western side of Eynham-road, Hammersmith, to abut also upon the northern side of Glenroy-street (Mr. J. R. Myring).—Consent.

Width of Way.

Marylebone, East.—Retention of a greenhouse at the rear of "Eastlake House," No. 133, Park-road, St. John's Wood, at less than the prescribed distance from the centre of the roadway of North-bank (Mr. A. J. Thomas for Miss E. Soutter).—Consent.

Stepney.—A one-story addition at the rear of No. 55, Commercial-road, Stepney, with external walls at less than the prescribed distance from the centre of the roadway of Plumber's-row (Mr. W. E. H. Crawley for Dr. Bernstein).—Refused.

Width of Way and Lines of Frontage.

Rotherhithe.—A pumping-station on the western side of New-square and New-lane, Shad Thames, Rotherhithe (Mr. M. Fitzmaurice for the Main Drainage Committee of the Council).—Consent.

Lines of Frontage and Construction.

Hackney, North.—That the Council do not accede to the request of Messrs. H. Pumphrey & Son, on behalf of Mr. J. H. Kemp, for permission to retain an iron shed upon part of the forecourt of No. 19, Filey-avenue, Upper Clapton.—Agreed.

Formation of Streets.

Lewisham.—That an order be issued to Mr. J. Johnson, sanctioning the formation or laying-out of a new street, and in connexion therewith the erection of stabling, on a site at the rear of houses on the south side of Fernbrook-road, and approached from the western side of Manor-lane, Lewisham.—Consent.

Islington, North.—That an order be issued to Mr. C. W. Calloot refusing to sanction the formation or laying-out of a new street for foot traffic only to be used as a covered market, out of the south-west side of Highgate Hill, Islington (Mr. J. W. Galton).—Refused.

Buildings for the Supply of Electricity.

Southwark, West.—The use of two railway arches, Nos. 11 and 14, on the northern side of a roadway connecting Gravel-lane and Ewer-street, Southwark, as a battery-room and transformer-room (Mr. G. A. Lansdown for the London Electric Supply Corporation, Ltd.).—Consent.

Space at Rear.

Strand.—A modification of the provisions of section 41, with regard to open spaces about buildings, so far as relates to the proposed erection of Nos. 102-114, Wardour-street (Mr. H. Tanner, jun., for Messrs. J. Mitchell & Co.).—Consent.

Space at Rear and Projections.

Kensington, South.—An addition, and projecting wooden oriel windows, at the rear of No. 24, Kensington-court, Kensington (Messrs. J. Barker & Co., Ltd., for Mrs. Reeves).—Consent.

Working-class Dwellings.

Hackney, North.—A deviation from the plan sanctioned for the erection of three blocks of working-class dwellings on a site on the west side of High-street, Stoke Newington, at the corner of Victoria-road, so far as relates to the erection of a row of baths (Messrs. Joseph & Smith for the Four Per Cent. Industrial Dwellings Company, Ltd.).—Consent.

Hackney, Central.—A deviation from the plans approved for the erection of blocks of dwellings on a site at the corner of Dalston-lane and Navarino-road, Dalston, so far as relates to the erection of a row of baths (Messrs. Joseph & Smith for the Four Per Cent. Industrial Company, Ltd.).—Consent.

The recommendation marked + is contrary to the views of the local authority.

Illustrations.

THE ROYAL ARMY MEDICAL CORPS MEMORIAL, ALDERSHOT.

THIS memorial has been erected by all ranks of the Corps in memory of their comrades who died during the South African War. It is situated within the grounds of the R.A.M.C. officers' mess at the top of Gun Hill, Aldershot, and faces towards the roadway. It was unveiled by H.M. the King on May 24.

The materials consist of grey Cornish granite and bronze. The granite is finished with a tooled surface. Old gun-metal from Woolwich Arsenal has been used for the tablets and other portions of the bronze work.

The central bronze group, which was modelled by Mr. W. Goscombe John, A.R.A., might be

entitled "An Act of Duty." It represents a officer and a private attending to a wounded soldier of the line. The fourteen bronze panels contain the names of 21 officers and 293 non-commissioned officers and men who died in South Africa during the war. The monograms and badge of the Corps are reproduced on the upper part of the obelisk. The bronze braziers on the two ends carry on the decorative tracery of the old classical altar of the "manes," and are arranged so that they can be filled with lights to burn on commemorative occasions.

The architect, Mr. R. Weir Schultz, is responsible for the complete scheme of the monument and for the details. Mr. Goscombe John has very ably carried out the central group in sympathy with the architect's ideas.

The granite work was executed by Messrs. Fenning & Co.; the subsidiary bronze work was prepared by Mr. Lawrence Turner and cast by Messrs. Broad & Co. The bronze group was cast under the direction of Mr. Goscombe John by Messrs. Hollingshead & Burton, of Thames Ditton. The total cost of the work has been under 1,100*l.*

TULLYLAGAN, CO. TYRONE, IRELAND.

This house is about to be erected from the designs of Messrs. Hart & Waterhouse, London. It is intended to use the hard local stone with as few mouldings as possible. The walls will be hollow, as the situation is very much exposed.

The roof is to be covered with green Welsh morland slate.

The feature of the house is the large inner hall with its recessed fireplace and oak screen which separates the corridor and gives a opportunity for effective pierced carving. The walls will be panelled, and the floors line with oak.

Messrs. Chapman & Lowry, of Haslemere, Surrey, are the contractors.

HOUSE AT DENBIGH.

This small house, built from the designs of Mr. E. Guy Dawber, is treated with rough cast on the walls, and the roof covered with grey-green Welsh slates, graduated from the eaves to the ridge. The casements are leaded and old stone has been worked into the entrance gable.

The contractors were Messrs. Roberts & Son of Rhuddlan.

CHURCH OF ST. CHAD, LONGSDON.

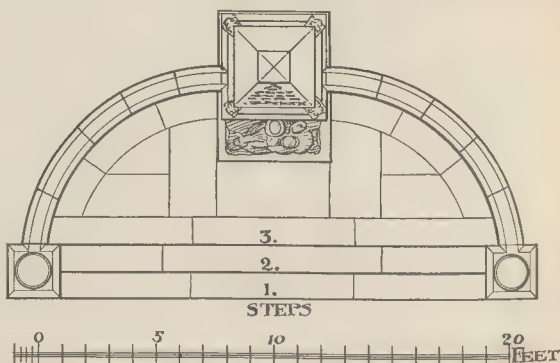
ANOTHER view of this church from the west end, with a plan and description, was published in our issue of September 17 of last year; and to this it may be sufficient to refer the reader.

Mr. Gerald C. Horsley is the architect, and the drawing is exhibited at the Royal Academy.

ILLUSTRATIONS OF LOSTWITHIEL CHURCH, CORNWALL.

THESE illustrations are given in connexion with the first article this week, to which the reader is referred.

The two exterior views of the church are from photographs taken by Mr. J. H. Coath of Liskeard.



Plan of War Memorial at Aldershot.

ARCHÆOLOGICAL SOCIETIES.

NEWCASTLE SOCIETY OF ANTIQUARIES.—A meeting of the Newcastle Society of Antiquaries was held on the 31st ult. in the library of the Castle, Mr. F. W. Dendy presiding. The Council recommended, and it was agreed, that whole-day meetings should be held during the year at Bellingham, in August or September, at Cockburnspath and Coldingham and at Berneceph; and half-day meetings at Chesham-Street and Lumley Castle and at Finchdale Abbey. Mr. J. C. Hodgson, F.S.A., presented a collection of Northumbrian proverbs, and Mr. F. W. Dendy read a paper on the Killingsworths of Killingworth. The Secretary (Mr. Robert Blair) announced that in answer to their appeal in respect to the Blackgate, for the repair of the masonry at the entrance exposed by the demolition of old buildings and for other necessary work, they had received subscriptions amounting to £19s. They wanted altogether 200*l*. The Chairman said that Mr. J. D. Milburn, one of the proprietors of the property adjoining the Blackgate, having determined to rebuild the portion abutting on the north side of the gate to the height of a single story only, it was necessary to make some repairs to the masonry of the elevation thus prominently opened to view. The demolition of the old houses on Mr. Milburn's site had revealed the picturesque outline of the gate, which at this point rose to a considerable height from the ancient moat. The work which must be immediately undertaken comprised the cleaning off of the whitewash and old plaster-work, the removal of a drain pipe, filling in of a few stones, the opening out of an archway (which possibly spanned the ditch within the gate), and the provision of an iron grille to enclose the same. In addition it was essential that the loops of the guardrooms should be repaired and opened out, and some splayed plinth courses renewed. An additional work much to be desired was the enclosure of the long narrow space within the gate on the south side, by the formation of a shed with a glass roof, etc., to receive the heavier alters and other objects presented to the society. This space covered the pit, or prison, known as the "Heron Pit," and extended to the Blackgate, erected in 1247, to the "second" or original gate of the Norman curtain. The Secretary reported that a Roman burial stone had been discovered some time ago near Gilsland railway station.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—At a meeting held at the Royal United Service Institution, Whitehall, on Monday evening, the 5th inst., Mr. N. J. West, President, in the chair, a paper was read on "The Improvement of London Traffic," by Mr. Charles Scott Meik and Mr. Walter Beer, in which the authors described the scheme laid by them before the Royal Commission on London Traffic last year, and offered it as a basis for discussion. Their chief proposals are for two main avenues through London from North to South and from West to East respectively. The north to south main avenue is designed to commence near Enfield and to extend through Tottenham, South Hensley, and Highbury, past the Parcels Post Office and Mount Pleasant, through Hutton Garden, across Holborn, the Strand, and the River Thames to St. George's Circus. Thence through Camberwell, Lambeth, and West Dulwich to the neighbourhood of Croydon. The west and east main avenue is intended to commence near Hounslow and to pass through Ealing, Acton, and Notting Hill, Paddington and Marylebone, to a junction with the north and south main avenue at Mount Pleasant. From Mount Pleasant this avenue would continue eastwards *via* Liverpool-street, through Stepney, Bow Common, and East Ham to the neighbourhood of Dagenham. These main avenues would together be 48 miles long, and the authors propose that for rather more than half their length they should be constructed with upper and lower roadways, the former passing over all cross traffic, and the whole design constituting a double-decked street. Each avenue would be 160 ft. wide, would provide a special road for fast motor traffic, a double line of tramway, and a double line of railway, the latter being situated either overhead (as in the case of the suspended railway at Elberfeld in Germany), in shallow subway, immediately below the main avenues, or in tube at a greater depth. The authors considered that the expenditure on

land could be almost entirely recouped by purchasing on both sides of the avenues land in excess of that required for the roads, and selling the surplus at its improved value.

COMPETITIONS.

TECHNICAL INSTITUTE, ROCHESTER.—One hundred and thirty-one designs have been received for the New Technical Institute at Rochester. The assessor has not yet been appointed.

PUBLIC LIBRARY, WORTHING.—The assessor in this competition was Mr. J. Belcher, A.R.A., and the plans submitted by Mr. H. A. Crouch have been selected. Three additional designs were selected by the committee to send to Mr. Carnegie, who is supplying the funds for the erection of the library—i.e., those of Messrs. Lanchester & Rickards, Messrs. Russell & Cooper, and Mr. J. O. Gibbon.

BOURNEMOUTH PARK-ROAD SCHOOLS, SOUTH-END-ON-SEA.—Of the fifteen sets of plans (by thirteen architects) sent in for this competition the Education Committee for the Borough of Southend-on-Sea have placed the following as the first three in order of merit:—(1) "Utility with Economy," Scheme B, Messrs. Greenhalgh & Brockbank; (2) "Light and Air," Mr. G. E. Clare (Messrs. Clare & Ross); (3) "Dum Spiro Spero," Mr. D. H. Smith.

BOOKS RECEIVED.

A MANUAL OF THE LAW OF FLATS. By G. St. Leger Daniels, Barrister-at-Law. (*The Estates Gazette*. 3s. 6d.)

THE RUDIMENTS OF PRACTICAL MATHEMATICS. By A. Consterdine, M.A., and A. Barnes, M.A. (John Murray.)

Correspondence.

LONDON DISTRICT SURVEYORS.

SIR,—I think that you will agree with me that great inconvenience is caused to the building public by the delay in filling up vacancies by the London County Council. The Metropolitan Board of Works always filled up any vacancy in a month or six weeks, while at the present time there are at least five districts vacant, and builders have to find out who is temporarily carrying on the business. Some interim surveyors are in office months and are allowed to practice, while the Council insists on permanent officials giving up practice, which accounts for the rapid falling off in the number and quality of the candidates.

The only person named in the Building Act as not allowed to undertake other work is the superintending architect, and yet the Council pile on him all kinds of duties and the supervision of an immense number of clerks.

The members of a small committee of the Council appear to do all they can contrary to both letter and spirit of the Act under which they are supposed to work. ARCHITECT.

COUNTY BOUNDARIES.

SIR,—The transfer of ten parishes from Essex to Hertfordshire is certainly, as Mr. Patrick remarks, a drastic alteration of county boundaries, but such alterations are, unfortunately, not nearly so unusual as he appears to think. In Warwickshire, at any rate, the boundaries seem to be constantly changing, and the reasons for such changes are not always evident. For instance, the boundary between the counties of Warwick and Leicester follows for many miles the Watling-street. This is not merely a county boundary, it is the historic boundary between the Danes and the English, yet, for some unknown reason, the line of this old boundary was broken a few years ago by the transfer of the parish of Hydes Pastures from Warwickshire to Leicestershire. On the western side of the county a similar, but less important, change has been made where the boundary used to follow the line of the Icknield-street across the open moorland of Sutton Park. In 1895 Warwickshire lost part of the parish of Mollington, which had belonged to it since the time of the compilation of the Domesday Book at the end of the thirteenth century. In the same year it also lost parts of two other parishes, while the whole of the parish of Stoneton was transferred to it from Northamptonshire, and, in the next year, the parish of Oldberrow from Worcestershire. And so one might proceed and soon make a

very considerable list of changes if it were desirable to do so. Perhaps, now that the British Archaeological Association has taken the matter up, such changes will be less common in the future than they have been in the past. BENJAMIN WALKER. Erdington.

THE VOICE OF THE ASSOCIATE.

SIR,—Will you allow me a small space in which to draw attention to a point of considerable importance at the present moment to the large body of Associates of the R.I.B.A.?

Some of these gentlemen—I think I may say many of them—have felt it their duty at recent meetings to give expression to their opinions on the subject of the election of Fellows by exercising their undoubted right of opposing, in some instances, the nominations endorsed by the Council.

This action, which, from the first, was viewed with obvious impatience, has recently been made the subject of outspoken protest on the part of some other members, who, apparently, hold peculiar views upon the subject of voting upon questions from the chair. It has, apparently, become an established tradition that the questions submitted by the chair for the verdict of the meeting are so submitted merely as a matter of form, and are by no means to be a matter for deliberation, much more opposition, which last is regarded as heterodox and unpleasant. On the most recent occasion, after various suggestions for disposing of this uncomfortable factor (and so reducing the voting to a farce) had failed, I myself was positively charged by a grave and highly-respected member with endeavouring to over-ride the by-laws, because, forsooth, I over-did myself at variance with the Council and its supporters upon the question before the meeting, and voted accordingly.

Now this is intolerable. I am aware that a comparatively young Associate may easily err upon the side of presumption when in the company of many of the leading lights of the profession, and also that, for many years, the attitude of the junior members has been so profoundly respectful that any effort to take an intelligent part in the conduct of the affairs of their Institute may easily appear startling; but surely the surprise should be intensely gratifying to our elders, instead of evoking fretful protest.

I am not alone in hoping that, within a comparatively short time, it will be found that the junior members have awakened to a livelier sense of the dignity of their status, and of the duties and responsibilities which attach to every grade of membership of the Institute to which we have the honour to belong. ASSOCIATE.

THE ARCHITECTURAL ASSOCIATION.

SIR,—I am surprised to find that funds have been forthcoming to very nearly cover the somewhat extravagant expenditure on the new premises, as many of the old and tried members are dropping out, or, at least, losing interest, and no wonder.

Of late years it seems to be the custom that, if any architect writes a book or wins two or three competitions, he is elected a member (often by acclamation), and, in a short time, pitched into the Council, and very quickly President, knowing nothing of the work of the Association. (Notice the date of election of the present list of officers, the majority in this century.)

In the years long since, men worked through every grade of office, and while still young attained the highest position; there was a nice feeling between the members, and the Society was one of mutual help; friendships were formed and lasted for life. Now all is changed.

This is not my opinion only; I have heard the expression of many opinions. OLD STAGER.

R.I.B.A. STUDENTS.

SIR,—No one having answered your correspondent N. C.'s letter in your issue of the 27th ult., I may be allowed to suggest to him that his letter will astonish the younger members of the profession far more than my last. Living as he does (as I see from the R.I.B.A. Calendar) in a Yorkshire town boasting but one other member of the Institute, he can hardly have had as much experience of his fellow-students as I, who am in daily intercourse with those who live in London; and I know that my letter expressed the views of a large number of the London R.I.B.A. students. Following N. C.'s lead, I would commend to his consideration the following facts:—

- (1) That unless one lives within a stone's throw of one's work it is impossible to work eight hours a day in an office and five hours a day at home.
- (2) That most students take at least half an

hour to reach home, and require a little time for meals, sleep, and social duties.

(3) That an employer would not be over-studied towards the end of the third year of study with a man who had worked five hours per day at home *without one break* for three years, for he would not be fit to work in the office.

(4) That "all work and no play makes Jack a dull boy."

(5) That an education covering the ground of the R.I.B.A. examinations crammed into three years is no education, and would be largely forgotten within three weeks.

Your correspondent has disregarded my point that the winners of the R.I.B.A. prizes are largely non-members; in fact, out of 233 winners in those competitions, in which there is an age limit, only 116 are members; how many of these latter have passed an examination I cannot say, but I believe very few.

In conclusion, my object in writing to you was not to endeavour to lessen the labour involved in studying for the examinations, but that involved in the preparation of the testimonies of study.

STUDENT, R.I.B.A.

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE-STEEL.—XXIII.

LOCOMOTIVE DEPÔT AT RENENS, SWITZERLAND.



NOVEL application of concrete-steel is to be found in the locomotive depôt recently erected at the station of Renens, on the system of the Jura-Simplon Railway Company, near Lausanne. Our readers are aware that buildings for the accommodation of locomotives are of two distinctive types:—(1) Roundhouses with turntables giving access to radiating tracks, and (2) rectangular sheds with parallel tracks. The latter type appears to be generally preferred in the present day and is that adopted in the design of the buildings described in the present article.

In the early days of the railway system timber framework entered largely into the roof construction of such buildings, then after a time metal began to be generally used. The most recent designs of locomotive sheds are to be found in Great Britain, where, curiously enough, a return has been made to the employment of timber framework, this development at first sight appearing to constitute a movement of retrograde character. On consideration, however, it must be recognised that there is some justification for the abandonment of metal work, which, owing to oxidation and injury due to the sulphurous fumes contained in smoke emitted from the locomotives, is so rapidly corroded as to involve heavy maintenance charges, by reason of the necessity for replacing large portions of the work at comparatively frequent intervals. In fact, the life of a steel roof truss cannot be put at more than ten or fifteen years. On the other hand, the products of combustion, thanks to the empyreumatic substances disengaged therefrom, tend to preserve timber and impart to it in some measure the quality of non-flammability.

The type of locomotive shed favoured in this country offers the advantage of being suitable for the application of flat roofing, which is difficult and costly in the case of a roundhouse. Flat roofing lends itself to more effective lighting arrangements and to the exclusion of cold air, which in winter often freezes water in the locomotive boilers. Further, it can be constructed very economically, for a thin flat roof supported by light columns costs far less than the complicated circular roofing system of a roundhouse.

Having made a careful examination of the various designs of locomotive sheds exemplified by the railways of different countries, Professor Bosset, a distinguished engineer commissioned by the Jura-Simplon Company, reported in favour of the British type, but with the modification that all parts of the structure usually built of timber should be constructed in concrete-steel, by the use of which the risk of fire is absolutely avoided. In consequence of this report, the *State service du contrôle* decided to reject the two sets of plans previously submitted by the company, the first including steel and the second timber framework, for the depôt to accommodate twenty-four locomotives at the station of Renens.

After a minute study, Professor Bosset produced the design for a roof system entirely in

concrete-steel and including not only the roof proper but also the hoods required for collecting smoke from the engines in the shed and the vertical flues for its discharge into the open-air. The advantages of the British flue arrangement are that when the funnel of a locomotive is introduced beneath a series of flues it projects for a distance of about 15 in. into the continuous hood, and at whatever point the locomotive may be stopped the smoke always finds its way out by one or other of the vertical flues. These flues are spaced about 15 ft. apart, and are fitted with butterfly valves which can be regulated in very cold weather, so that, while sufficient draught is maintained for carrying away the smoke, the cold air is prevented from descending into the building.

The chief difficulty presented was to reproduce this system in concrete-steel. The problem was solved by the construction of the hoods in reinforced concrete of fine quality about 35 millimetres thick, the hoods being suspended from the roof by steel bars provided with turnbuckles to permit of the necessary adjustment. The hoods discharge into vertical flues, spaced 5 metres apart, fitted with butterfly valves and finished with weather cones.

The roof proper consists of a series of beams supported by columns of concrete-steel. Fig. 154 is a half plan of the roof, showing the six bays formed by the main beams and the panels into which it is divided by the secondary beams. The columns are spaced 10 metres apart and the side frames of the roof lanterns constitute beams of 10 metres span. The height of the columns, 6 metres, was purposely kept down so as to do away with unnecessary space and thereby make more easy the maintenance of an equable temperature. Except where the lanterns occur the roof is flat, being composed of a concrete-steel slab supported by the beams, as in the case of a concrete-steel floor. The roof surface has slopes of about 1 in 30, but these were varied as occasion demanded so as to insure the flow of water towards the columns, against which rainwater pipes are fixed. It was originally the intention to utilise the interior of the concrete-steel columns instead of separate drain pipes, but the *contrôle de l'état* refused to sanction this arrangement as being contrary to precedent. Figs. 155 and 156 are longitudinal and transverse sections of the depôt which make clear the main features of the building.

The roof slab is covered with material termed "ciment ligneux" or "ciment de bois," over which is spread a layer of gravel 10 centimetres thick to protect the cement from the direct rays of the sun.

"Ciment de bois" is composed of a layer of millboard impregnated with bitumen and three layers of paper similarly treated. The millboard is first laid upon a thin bed of sand spread upon the cement surface of the flat roof, with the object of rendering the millboard capable of independent movement, so that it may be free to expand under the influence of heat; next the upper surface of the millboard is covered with bitumen, laid on hot with a brush, and on this is spread the first sheet of paper. This and the remaining sheets are covered with bitumen as in the case of the millboard, with the result that the "ciment de bois" includes four layers of bitumen, one layer of millboard, and three layers of paper.

At the sides of the lantern frames certain precautions became necessary to prevent the penetration of moisture. Strips of zinc were interposed for a distance of 15 centimetres between the millboard and the paper, and cemented by means of bitumen applied with a brush, so that the strips of metal were practically extensions of the bituminous roof covering. Each strip was bent upwards for a height of from 15 to 20 centimetres, to form flashing against the side of the lantern framing. The precise height of the zinc strips necessarily varies from case to case according to climatic conditions. For instance, on buildings situated in places where heavy falls of snow may be anticipated, the vertical returns of the zinc must be of ample height, and it may be desirable to add a supplementary strip above the first one, in order to guard against the penetration of moisture from the melting snow, especially in the case of roofs pierced by a large number of lanterns, because these are almost certain to result in the formation of deep snowdrifts.

The gutters of the depôt at Renens are constructed in reinforced cement, covered with sheet zinc, laid in such manner as to permit free expansion under the influence of heat, and bordered at the edge, or edges, as the case may be,

by a light curb, which maintains the layer gravel on top of the roof at the thickness of centimetres.

The question may be asked whether it would not be possible to make watertight gutters of concrete or cement without the employment of zinc lining. In reply, it should be said the while gutters of comparatively small length can be so constructed without risk of leakage, through the concrete, it is certainly preferable to add a lining to gutters of considerable length. In the locomotive depôt at Renens some of the gutters are 65 metres long, and, if not lined, would be scarcely possible to insure their continuous watertightness, because if one or two cracks were produced by expansion and contraction the whole length must be regarded as leaky. Hence the most prudent course was to line the gutters with metal.

In a considerable length of guttering both the cement and the zinc should be capable of independent action under the influence of temperature changes. The adoption of the following method will enable the architect to comply with all necessary conditions. After the channel has been moulded, concrete is added where necessary to insure the proper fall then the interior is covered with bituminous paper, over which the zinc lining is laid. The employment of paper is desirable because some brands of cement contain an excess of free lime and should not be in direct contact with the zinc.

Small details of construction such as this are worthy of attention, as by the adoption of proper precautions it is often possible to obviate many inconveniences, which may sometimes develop into grave defects.

As previously explained, the hoods serve to collect smoke from the interior of the depôt are of concrete-steel, being formed by plate 35 millimetres thick. The vertical chimneys also of concrete-steel, are circular in cross section with an internal diameter of 75 centimetres, the wall of the flue being 35 millimetres thick. Each of the chimneys is fixed in socket of concrete-steel moulded upon, and monolithic with, the roof slab. Thus, the smoke hoods and the vertical flues are not immovably fixed to the roof, but are free to slide within the sleeve joint, a condition very necessary for the avoidance of undue strain upon the concrete of the roof and the chimneys. Fig. 15 is a section in which, among other details, the construction of the hood and chimney is clearly shown.

The flat roof slab, with an area of about 2,670 square metres, is supported along the edge by a thick bed of sand and a layer of paper laid on the upper surface of the walls, the expansion joint so constituted being intended to permit lateral expansion of the concrete-steel without involving the slightest risk of injury by dilatation of the slab. This detail of construction has the effect of detracting in some measure from the monolithic character of the building as a whole, and, as a matter of fact, was insisted upon by the engineers of the railway company. It is by no means certain that the expansion joint so designed will actually answer its intended purpose. On the contrary, in spite of the interposition of paper above the bed of sand, it is necessary that the grains of sand should be round and of uniform diameter if they are to act after the manner of balls, or even of rollers, in a bearing. But as grains of sand are not smooth and perfectly spherical like steel balls, it is by no means improbable that the weight of the roof covering will militate against the free play intended by the designers although to a certain extent such action may take place.

With regard to the general question of expansion, it is undoubtedly the fact that, in buildings of considerable size, movements due to dilatation of the roof covering have a tendency to cause slight cracks in the walls. These are not necessarily of serious importance, but observation shows that perceptible separation occurs at certain times at the junction of the roof and the walls.

We do not go so far as to say that the idea of providing a rolling expansion joint for the roof slab is either useless or impracticable, and merely content ourselves by pointing out the nature of the precaution taken against the risk of fissures in the depôt here described.

Fig. 158 is a section showing, to a larger scale, the construction of the smoke-collecting hoods and vertical chimneys in the depôt.

The hood descends, as already mentioned, to such depth that the upper extremity of the locomotive funnel is about 40 centimetres

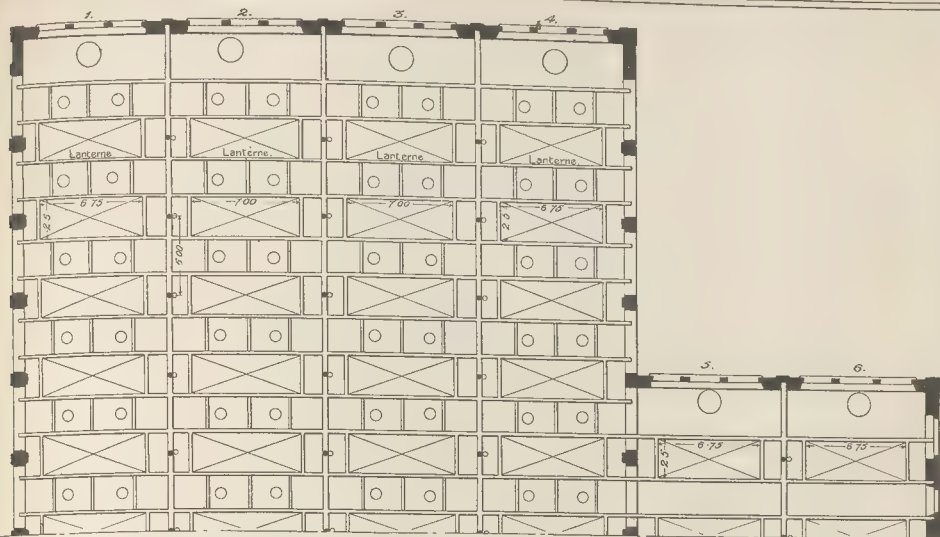


FIG. 154.

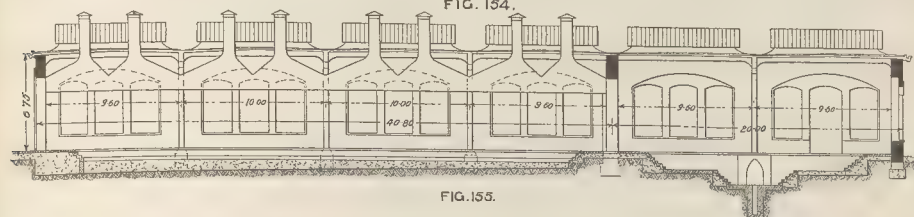


FIG. 155.

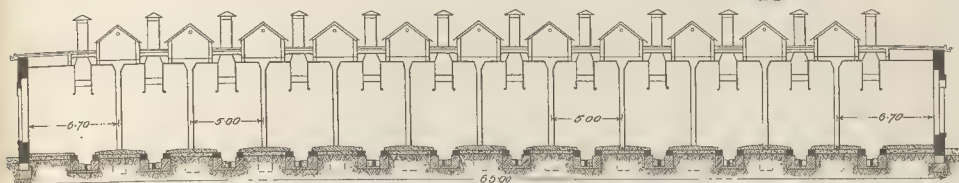


FIG. 156.

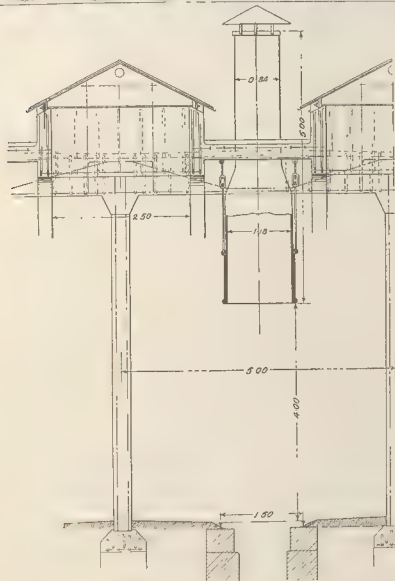


FIG. 157.

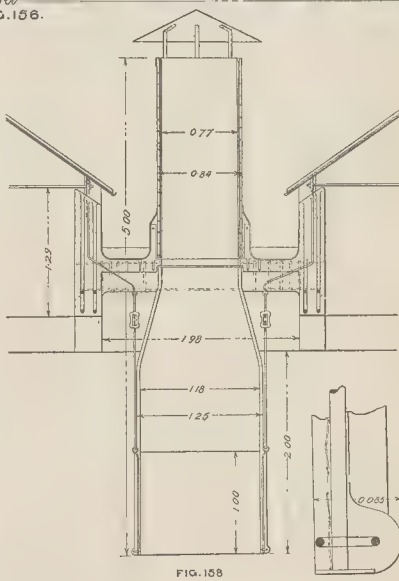


FIG. 158.

above the lower edge of the hood, which is suspended by steel bars, and is provided with steel plates along the bottom. Above the turnbuckles, the bars are bent outwards and continued into the concrete of the lantern walls, where they are securely anchored, as shown in the section. The same drawing shows the construction of the socket forming a sleeve joint for the vertical flue. It will be seen that both portions are perfectly free to move each independently of the other. The socket projecting above the roof slab, is formed of fine concrete-steel coated with tar, over which is zinc flashing, connected with the "ciment de bois" in the manner previously indicated.

It may confidently be predicted that the system of chimney construction here described will be followed in other locomotive depots, of which several are about to be built in different parts of Switzerland and on the federated lines of railway.

French engineers have already taken much interest in this application of concrete-steel, and we believe it to be thoroughly worthy of attention on the part of railway engineers in this country.

WESTMINSTER CITY COUNCIL.

THE usual fortnightly meeting of this Council was held on Thursday, last week, at the City Hall, Charing Cross-road.

Mouthmouth-court, Proposed Closing.—The Improvements Committee reported having received a letter relative to the proposal of Messrs. Hampton & Sons that they should be allowed to absorb and build over Mouthmouth-court on condition that they surrender certain land to the City Council, and pay the Council a sum of 1,000*l*. The Committee recommended that the Council should inform Messrs. Hampton that they were not prepared to deal with the matter at the present time, adding that they (the Committee) understood that H.M. Office of Works considered that the National Gallery was now sufficiently isolated, and that they would derive no particular benefit from the new street which Messrs. Hampton proposed to construct and throw open as additional compensation for the closing of the court. The recommendation was agreed to.

London Building Acts (Amendment) Bill.—The Law and Parliamentary Committee reported having received various letters from public bodies, etc., in regard to this Bill. Among the letters was one from the Town Clerk of Kensington enclosing copy of the report drawn up by a committee on the recent conference of Metropolitan Local Authorities, and stating that the conference at a subsequent meeting had passed the following resolutions:—That, with reference to the communication recently addressed to the Metropolitan Local Authorities on the subject of the amendment of the Building Acts, this conference desires to reiterate the view expressed at its former meeting, that, before any amending Bill is drafted, the whole question of the administration of the Acts should be reported upon by Royal Commission, in order that the new legislation may not only provide for the consolidation as well as the amendment of the existing law, but may ensure a substantial devolution of the administration of the Acts from the central to the local authorities. That it is suggested to the Metropolitan Local Authorities that they should, in replying to the communication of the London County Council, make it clear that no Amendment Bill will be deemed satisfactory which does not provide for all administrative duties under the Acts which can be efficiently discharged by the local authorities, being transferred to those bodies in accordance with the views expressed by the Royal Commission in 1894. It was agreed, on the recommendation of the Committee, to inform the Town Clerk of Kensington that the City Council concurred in the resolutions.

Gaiety Restaurant, Alleged Infringement of Building By-laws.—The Public Health Committee reported that they had directed a letter to be sent to the persons responsible, requiring immediate compliance with the law in the case of certain water-closets at the Gaiety Restaurant, which the Committee stated had been erected in a manner contrary to the provisions of the by-laws of the London County Council.

Ventilation of Surface Boxes.—The Works Committee reported having received a letter from the Engineer-in-Chief of the General Post Office with reference to the standard types of street boxes to be used by the Post Office Telegraphs Department, which were recently approved by the Council, stating that arrangements had been made to comply with the Council's request that the covers of footway boxes should be filled in with material similar

to the surrounding pavement. In regard to a suggestion contained in the letter, that ventilating pillars should be fixed in the footways for the ventilation of the boxes, the Committee recommended that the Engineer-in-Chief of the General Post Office should be informed that the Council could not entertain such a proposal. This was agreed to.

OBITUARY.

MR. DUNN.—Mr. William Henry Dunn died at his residence, No. 1, Belle Vue-terrace, Durham-road, Gateshead, on May 24, in his sixty-third year. He practised as an architect at No. 5, St. Nicholas-buildings, Newcastle-on-Tyne, under the style of Messrs. Thompson & Dunn, having continued, in Newcastle, the practice of his partner, the late Matthew Thompson. Mr. Dunn, who began his career in the comparatively obscure calling of a journeyman artificer, raised himself to a leading position amongst his fellow townsmen at Gateshead, becoming a member of the Town Council about twenty-five years ago, and subsequently an alderman of the borough; he was elected Mayor of Gateshead in 1883, and again in the following year. He made the plans and designs of the Baptist church in Heaton-road, Newcastle-on-Tyne, having a capacity of 750 persons, 1896; and of the vestry hall and school-rooms for St. Christopher's, at Walker, Northumberland, 1893. He was the architect of many schools for the Borough of Gateshead School Board, comprising the schools in Rose-street; at Teams; and those, for 750 scholars, in Kelvin-grove (1887), which he afterwards enlarged with the addition of six classrooms and a central hall, and of a junior department for more than 350 in Victoria-road. Mr. Dunn was a member of the Northern Architectural Association, and served for a term as President of that Society.

GENERAL BUILDING NEWS.

HOLY TRINITY CHURCH, DERBY.—The consecration of the new church of Holy Trinity, London-road, Derby, took place recently. The church has been erected by Messrs. Walker & Slater, builders of Derby, the architect, being Mr. Charles E. Hewitt, of Brighton. The amount of the contract including the tower, is 9,400*l*. The building is cruciform in plan, consisting of a nave, with aisles, transepts, and apsidal chancel, and a west-end tower, which merges slightly into the nave. The vestry, with heating-chamber underneath, is situated on the south side of the chancel. The heating is carried out by a low-pressure hot-water system, this work having been entrusted to Messrs. Jerram, of Derby. The organ and choir are accommodated in an organ loft, or small west-end gallery, but the old side galleries like those in the old church have been dispensed with. The organ has been renovated by Messrs. Bevington, London. The nave arcade is surmounted by clerestory windows, and ventilation of the church is secured by means of Boyle's patent extract and inlet ventilators, in addition to the openings in the various windows. Red sandstone bricks, with Cobden stone dressings, are the materials supplied for facing the external walls, with Kelton and Coxbench stone dressings internally. The church will seat 800 people, and the tower rises to a height of over 100 ft. The clock has been put in by Mr. Smith, of Derby; whilst Messrs. Taylor, of Loughborough, have put in a new bell frame and rehung the bell. The electric light is the work of Mr. Edwin Haslam, of Derby, and the leaden lights for the windows were furnished by Messrs. Wheel-don, of Croydon. The floor is laid with wood blocks. All the seats are of pitch-pine, and some of the old seats have been used again. There is a new font by Jones & Willis, Birmingham, and the pulpit is the same as was used in the old church, but it has been renovated and made shorter.

HOLY TRINITY CHURCH, FERNIELE, NEAR BUXTON.—The Bishop of Southwell recently consecrated the new church dedicated to the Holy Trinity in the township of Ferniele, six miles north-west of Buxton. The plans, prepared by Messrs. P. H. Curry and C. C. Thompson, architects, of Derby, include a nave, with south aisle, and a small bell turret, as well as a chancel, with organ and vestries, and will give accommodation for 450 worshippers. At present, however, only the nave has been built, and the arches into the aisle and to the chancel have been closed with temporary walls. The style of the building is late Gothic; the walls are built of local rubble stone, the arches, window tracery, etc., being worked in Matlock stone; the roof is of pitch-pine, all woodwork being exposed to view in the interior, and left its natural colour; externally, it is covered with rough grey slates from Preceley,

in South Wales; the porch is formed of oak framing, filled in with cement panels, and a temporary bell cage has been formed on its gable; the internal walls have the stonework exposed to view, but are lined to a height of 4 ft. with boarding stained green; all the internal furniture and fittings are of a temporary character. The general contractors for the building were Messrs. Fox & Goddard, of Whaley Bridge; the heating apparatus has been supplied by Mr. Isaac Beeley, of Hazelgrove; the carving on the pillars was done by Messrs. R. E. Martyn & Co., of Cheltenham; the wrought-ironwork in gas fittings, door bands, etc., has been made to the architects' designs by Messrs. Taylor, Whiting, & Taylor, of Derby.

CHURCH, LIVERPOOL.—The Church of St. Nathaniel, in the district of Windsor, Liverpool, has just been opened by the Bishop of Liverpool. The new church, which falls back a distance of some 80 yds. from the north side of the top of Upper Parliament-street, takes the place of one destroyed by fire in February, 1891. The style of the new church is entirely different from the plan usually adopted in modern churches, the Basilican arrangement being reproduced. The old church had a length from east to west of 105 ft., and a breadth from north to south of 61 ft., and the new church is 123 ft. long and 61 ft. wide. The nave, which is the central part of the church, is 83 ft. long, with a width between the columns of 36 ft. There are north and south side aisles, each 3 ft. 6 in. wide, and a centre or nave aisle of 4 ft. 6 in. in width. The nave is divided from the side aisles by an arcade of four arches, supported on solid square columns of Darley Dale stone, carved and moulded. Above the nave arches there is a clerestory pierced with lancet-shaped windows, all the other windows throughout the church being of that character, but those at the east and west end are filled with tracery. The choir space is raised three steps above the nave, and the choir stalls provide accommodation for a choir of forty-one. Round the semi-circular end of the chancel, and at the extreme east end, twenty-five stalls have been fixed. These have elaborately-carved canopies, pillars, and finials, with a sloping shingle roof over the stalls, the whole being executed in Danzig oak, 4 ft. away from the east wall, and following the circular formation, there is the Communion step and Communion rail, which also extend across the chancel. The total length of Communion rail is therefore 55 ft., as against a length in most churches of about 25 ft. The materials used in the construction of the building are Edwards' red bricks and terra-cotta; pitch-pine for all the exposed timbers in the wagon-vaulted roof and the seats; and the chancel fittings, pulpit, reading-desk, lectern, choir stalls, Communion rail and Holy Table are all in oak. The church is lighted with gas, the heating is by low-pressure hot-water, and the ventilation is carried out by extract and ventilating radiators. The contractors for the constructional works are Messrs. H. E. B. Greene & Co., Liverpool, the architects being Messrs. George Bradbury & Sons, Liverpool. The stained windows and all the leaded glazing have been executed by Messrs. Williams Brothers & Co., of Liverpool. *Liverpool Courier.*

TRINITY PRESBYTERIAN CHURCH, NEWCASTLE-ON-TYNE.—The Trinity Presbyterian Church, Northumberland-road, which was damaged by fire in November last, has just been reopened. The work of repairing the church was immediately taken in hand, Messrs. Cockett & Burns, Dick being the architects, and the renovation has now been completed at a cost of considerably over 3,000*l*. The roof, which was the most badly damaged part of the building, has been renewed in pitch-pine; there is a new pulpit in oak; there are new choir seats also in oak; and there has been an entire renovation of the heating apparatus, the material used being Oregon pine. But the structural alterations have been carried out in much the same style as formerly. The contractors were:—Mr. Wm. Nicholson, of Goeforth, for the structural work; Mr. Richardson, for the painting; Messrs. Falconer, Cross, & Co., for the heating; and Messrs. Robson & Sons, for the lighting. The organ has been restored by Messrs. Nicholson & Newbigin. The clerk of works was Mr. Thomas Mariner.

CONGREGATIONAL CHURCH, SUTTON-IN-ASHEFIELD.—The foundation-stone of this church was laid on the 24th ult. The church occupies a prominent corner site, with a tower as a feature at the angle. The contract is let to

Mr. John Greenwood, of Mansfield, the amount being 3,982l. 15s. 4d. The church will accommodate 850 persons. The architects are Messrs. George Baines & Son, London.

BARNBY CHURCH, SOUTH BANK, YORKSHIRE.—The building is about to be commenced. The contract amount is 3,244l. for the church, church parlour, vestries, etc., the seating accommodation being for about 650 persons. Future schools are arranged for at the back of the site.

The architects are Messrs. George Baines & Palmer Baines, London.

BRANDAL CHURCH, BURNSTLAND, N.B.—The new church for St. Serf's congregation at Burnstland has just been completed. The church, which is in the Gothic style, is of stone from Grange Quarry. The roof is left open up to the ridge inside, and is covered with red tiling outside. The contractors were Messrs. Jackson & Son, mason work; J. Patterson, joiner work; J. Williamson & Son, roofing; W. Anderson, plaster and tile work; W. Barclay, the painter—all of Burnstland; Frew, Watson, & Co., Edinburgh; and J. Miller, Glasgow. A pencil sketch plan was drawn by Mr. F. L. Pearson, architect, Burnstland, and handed to Mr. W. R. Simpson, architect, Burnstland, to prepare working plans and superintend the building operations. The cost of the new church is 2,300l. The church is seated for 200 worshippers.—*Dundee Advertiser.*

BARTON CHAPEL, SHIREHAMPTON.—The new Baptist chapel at Shirehampton has been opened. The estimated cost of the building was 2,044l., and accommodation has been provided for a congregation of about 300. The chief entrance is from Pembroke-road, the chapel being reached through a porch on both sides, which has a lobby. At the further end of the building are vestry-rooms and other offices. The plans were prepared by Mr. Benjamin Wakefield, of Bristol, and the work has been executed by Messrs. Biss & Sons, of Portishead. The chapel is 50 ft. by 27 ft., and the height from floor to top of the roof is 28 ft. The east and west walls are panelled on the inside to the height of 4 ft. 6 in., these panels being movable, so that they may be pulled out to form sixteen classrooms. The roof is an open timber one, covered with red tiles, and the floor is of pitch-pine wooden blocks. The building will be heated by the hot-air system, and the light will be incandescent gas. The baptistry is constructed of white Sicilian marble.

WESLEYAN CHAPEL, WADDINGTON, LINCOLN.—A new Wesleyan chapel and schoolroom is being erected at Waddington, at a cost of about 1,000l. The chapel will be 49 ft. long by 23 ft. wide, and will be seated to hold 150 persons. The schoolroom adjoining, 30 ft. by 20 ft., will communicate with the chapel by sliding doors, and there will also be a vestry. The front of the chapel will be of red pressed bricks, with dressings of stone from the Waddington yard. In the principal gable will be a traceried window 14 ft. by 8 ft., and the whole building will have a tiled roof, and the seats will be of pitch-pine, varnished. The plans have been prepared by Mr. J. T. Drury, of Lincoln, and the contractors are Messrs. W. & M. Halkes, of Lincoln.

PORTHEAD NAUTICAL SCHOOL.—The nautical school at the Nore, Porthead is nearing completion, and the Education Committee have just made a tour of inspection of the buildings. Mr. E. Gabriel is the architect, Mr. F. Cowin the builder, and Mr. G. Crispin the sanitary engineer.

St. Peter's School, York.—At St. Peter's School, York, was opened, on the 1st inst., a new wing which has been built to meet the scholastic demands made upon the institution. The new wing has been built on the site of the old school-house and covered play-shed, and is of red brick, with green Westmorland slated roofs. The central portion, which is taken up three stories, is covered with an asphalt floor, to which there is access by a turret staircase. The work has been carried out, at a cost of about 6,000l., by Mr. T. S. Ullathorne, of Selby, from the designs and under the supervision of Mr. Brierley, architect, of York. A feature is the provision of a changing-room, fitted with foot and shower baths.

METHODIST BUILDINGS, WASHINGTON STATION. The foundation-stones have just been laid of a new Primitive Methodist Sunday school and classroom at Washington Station. The building, when completed, will comprise a schoolroom, capable of seating 250 scholars, and a smaller infants' schoolroom or C.B. hall to hold about 50 people. The school will cover an area of 40 ft. by 19 ft., with a transept 19 ft. by 12 ft. The entrance will be from the main road, an inner vestibule leading directly into the school. The building will be faced with Pelaw pressed bricks. The plans

have been prepared by Messrs. Davidson & Phillipson, architects, Newcastle, while the contractors are Mr. R. Bruce, New Washington.

CHURCH OF ROSE, HARROW.—The Bishop of Islington recently opened the new church of Rose at Sudbury. The new structure holds over 200 persons, and has, at the north-east end, a small chancel. This is divided from the rest of the building by means of a metal curtain. The room was designed by Mr. Arnold Mitchell, and built by Messrs. G. & J. Waterman, of Watford, at a cost of nearly 2,000l. Opening out of the hall is a classroom, which will hold about thirty people. There are also a suite of caretaker's rooms, and a scullery.

PRESBYTERIAN ASSEMBLY BUILDINGS, BELFAST.—These new buildings for the Irish Presbyterian church comprise extensive offices, committee-rooms, and three large halls. The assembly hall, planned to seat 2,500 persons, has two galleries, with panelled oak fronts, and a ribbed ceiling of Oregon pine. All the walling is of County Down sandstone, with Glasgow stone internally. Bath stone is extensively used. The roof is of green slates over the roofs, and the copper covering of the large square tower, which is about 170 ft. high, was constructed by Messrs. Ewart & Son, London. The peal of twelve bells, with tenor weighing 42 cwt., was cast by Taylor & Co., Loughborough, with clock and carillon, and is worked by electricity. Messrs. Robert Corry, Ltd., are the contractors, and the architects are Messrs. Young & Mackenzie, of Belfast.

THE BANGOUR VILLAGE ASYLUM, NEAR EDINBURGH.—The official inspection by the Board of Trade Inspector, Colonel Von Donop, took place on the 17th ult. of the Bangour Railway, which has been constructed by the Edinburgh District Lunacy Board from Uphill Station to Bangour, as a convenient means of communication with the village asylum at that place, now being constructed for the reception of the pauper lunatics of the city. The railway, two and a half miles in length, has cost over 30,000l. It has been in operation for some time in conveying material for the buildings in course of erection at Bangour. Mr. Tait is the engineer of the railway. An informal inspection afterwards took place of the buildings at Bangour, under the direction of Mr. H. J. Blanco, the architect. For some time past there have been two hundred patients in residence, who are accommodated in four of the cheaply-constructed pavilions of wood and iron which were erected, on the instructions of the Board of Lunacy, so as to ease the pressure at the Mornington Asylum. There is a fifth pavilion, which is used as an administrative block. The large administrative block, which occupies a site on the face of the southern slope of the estate—all the buildings are so situated—is fast nearing completion. The central block, three stories in height, contains reception-rooms for patients and the necessary accommodation for the medical staff. Right and left of this accommodation for male and female patients under observation has been provided. This consists of a day or dress room, and dormitories for twenty patients on each side. From these observation wards the patients, within a few days of their admission, will be allocated to the several other pavilions suitable to their mental and physical condition. To the east and to the west of this block, two on each side, four pavilions—two for women and two for men—for acute cases, fifty in each, have been planned. In this part of the ground the hospital will be reared, and in the eastern corner, shaded by trees, the mortuary has already been built. By the side of the railway line a power station and workshops are in course of construction. This will include the boiler-room for generating steam for the whole of the village, the dynamo-rooms, workshops for the male patients, coal stores, etc.; immediately to the west is a duplicate building, containing the central kitchen and stores, with a covered way between them 27 ft. in width. The kitchen, 65 ft. by 40 ft. by 25 ft. in height—the stores being practically of similar dimensions—and its necessary offices are well arranged, and adjoining it are a bakery and cold storage. The next building, westwards, is a laundry, 70 ft. by 30 ft., with washing and drying houses, ironing-rooms, etc. Beyond this there are now in course of erection four more pavilions, each designed for fifty female patients, capable of being industrially employed. At the present time buildings have been contracted for which will accommodate 750 patients; but all the offices, such as kitchens, laundry, etc., have been designed to meet the requirements of the full number which may be accommodated in the village—viz. 1,000 patients. Should further accommodation be required in the future, there is ground on all sides for extension. On the crest of the hill is the house of the chief medical officer. For the water supply of this village community it was necessary to construct,

from plans by Mr. Tait, C.E., a reservoir on the head waters of the Broxburn at a cost of 30,000l. This pond is capable of containing 134 million gallons of water, which is equal to about 80 to 100 gallons per head per day of the resident population of the village, estimated, say, at 1,200. Near it are filter-beds, and a clear-water tank.—*Scotsman.*

INSURANCE BUILDINGS, BRISTOL.—The new buildings for the London and Lancashire Fire Insurance Company, Bristol, are situated in Corn-street. Mr. Edward Gabriel is the architect. The building now completed covers an area of 3,690 ft. super. Externally, the ground floor is executed in granite, above which Hartham Park Bath stone is used. The carving has been carried out by Mr. Gilbert Seale. Internally, the ground floor area is in the occupation of the various departments of the company, and here the walls are lined with tiles by Messrs. Craven, Dunnill, & Co., who have also executed the striking faience mantelpieces. All the joinery is in oak, with the exception of the fittings, which are mahogany. In the basement are strongrooms and lavatory accommodation, with a warehouse in the rear part of the building. There are entrances to the upper floor offices from Corn-street, and also from Shannon-court. The staircase is of stone, the walls of which and the corridors are lined with Rust's vitreous mosaic, this material being also used for the floors of corridors and passages. An electric lift gives access to all the floors. Lavatory accommodation is provided. The whole of the work has been carried out by Mr. R. F. Ridd, under the supervision of the architect on behalf of the company.

HOUSING SCHEME, EARSWICK, YORKSHIRE.—A scheme of housing and improvement is now being carried out at Earswick, near York, on lines similar to Bournville. Two types of houses are being built so far: cottage houses, which let at 4s. 6d. a week, and "parlour" houses at 5s. 8d., exclusive of rates in each case. The cheaper cottages contain a kitchen, living-room, pantry, and three bedrooms. Messrs. Unwin & Parker are the architects responsible for the scheme.

BUILDING IN NOTTINGHAM.—The following table, showing the number of new buildings in Nottingham, has been passed by the General Works and Highways Committee of the Corporation. The number of buildings passed in the last four years was:—Year ending March 31, 1902, 2,065; year ending March 31, 1903, 2,776; year ending March 31, 1904, 2,010; year ending March 31, 1905, 1,531.

JOHNSON MEMORIAL CHURCH, BICKERSHAW.—This new church was recently consecrated. The church is on a site in Bickershaw-lane, adjoining the schools belonging to the Abram Collieries, and it provides seating accommodation for over 200 persons. The chancel is separated from the nave by a large chancel arch, with a low curb wall, designed to receive chancel screen, and the chancel floor is enriched with encaustic tiles; choir benches, with carved ends and fronts, are also provided. The building throughout is lighted by electricity. The vestries are on the north side, with separate entrance for the use of clergy and choir, and separated from the chancel by an arch and ornamental screen. The pulpit is of oak, and the font is of red Rainhill stone. A bell has been placed in the ornamental stone belfry, which has been erected on the main roof over the chancel arch. The whole of the work has been carried out from the designs and under the supervision of Mr. Frank Freeman, architect, Bolton, Messrs. Moore Brothers, of Rawtenstall, being the contractors, Mr. Henry Molyneux, of Abram Collieries, acting as clerk of works.

NEW OFFICES, WESTMINSTER.—A building, consisting of a block of offices and business premises, to be called "Parliament-chambers," and facing the Church House, Great Smith-street, Westminster, is now being completed for Mr. E. J. Read, of the London Banking Corporation. The property consists of over 100 offices. The entrance-halls are panelled with Irish green and black Devonshire marble, and the steps are of white Sicilian marble. The elevation is carried out in red bricks, with carved gauged work, and tawny terra-cotta dressings. Messrs. L. Whitehead & Co. are the builders, Messrs. Palgrave & Co. architects, and Mr. Farrell their clerk of works.

NEW FLATS, WIMBLEDON.—A new building is to be erected at the corner of Belvedere-grove and Courthope-road, Wimbledon Hill, to be called "Clifford House," and to consist of high-class residential flats. Messrs. R. Ward & Son, Battersea, are the contractors, and Messrs. Palgrave & Co. are the architects.

NEW CHURCH, FISHPONDS, BRISTOL.—The first section of All Saints, Fishponds, was opened by the Bishop of Bristol on the 26th ult. The style is that of the XIVth

century, and the portion so far constructed includes chancel, morning chapel, two vestries, organ-chambers, south-east porch, and the first six bays of nave and aisles, the whole of which will ultimately seat 700 people. The walls are of rock-faced and level-bedded local stone, lined with adamant plaster, with windows and dressings, generally of Haslem Park stone, with polished Belgian marble and blue Rensselaer shafts for the various internal columns, with profuse natural foliage carving in their caps and elsewhere. The roofs are of open-timber description, boarded, felted, and covered with brown and red mixed Broseley tiles. The floors of chancel and porch are laid with terrazo marble mosaic, and the gangways with oak wood blocks. The contractors were Messrs. Clark & Sons, of Fishponds, and the architects Messrs. E. H. Lingner Barker & Son, of London, Bristol, and Hereford.

STAINED GLASS AND DECORATION.

ST. MARGARET'S, WESTMINSTER.—Canon Henson, Chairman of the Restoration Committee, writes to the *Times* of Wednesday, making an appeal in reference to the work of internal restoration which is projected at St. Margaret's Church, and especially in regard to the great east window. He says that the Committee are advised that the window needs to be taken out and unskeladed, and that unless the work is undertaken without delay the glass will suffer. It has been decided at the same time to undertake the renovation of the east end of the church, and to entrust the work to Mr. C. E. Kempe. The Committee will be able to acquire from His Majesty's Office of Works possession of the narrow strip of ground which separates the wall of the church from the railings, and it is proposed to utilise the additional space. Accordingly, the new east wall will be built a little eastward of the present wall, giving a slightly greater length to the chancel. The cost of the work will be about 3,000*l.*, and an appeal is made for financial assistance.

CHANCEL SCREEN AND LECTERN, CHRIST CHURCH, CARLISLE.—The Bishop of Barrow-in-Furness recently dedicated the chancel screen and lectern which have been erected in Christ Church, Carlisle, as a memorial to the late Rev. J. C. Butterworth. The screen has been carried out in oak from the designs of Mr. J. H. Martindale, Carlisle. The lectern has a movable bookboard in the form of an open volume which works in quadrants, and can thus be adjusted to the light. The pilasters have carved terminals, and the frieze is carved over each tracery panel, included in the design at the front being the symbols I.H.S., X.P., and Alpha and Omega, whilst over the panels on the return at the steps are chiselled cherub heads. The whole of the work has been carried out by Mr. Hetherington, Carlisle, who was responsible for the carving; the executors of the late Mr. J. H. Reed did the oak work; and Messrs. J. & R. Bell were the contractors for the stone base.

STAINED-GLASS WINDOWS.—At Holy Trinity Church, Southwark, a large stained-glass window, representing the Nativity, has been placed, with a brass memorial inscription beneath it. The window was executed in the studio of Messrs. Bacon & Brothers, who have also just erected a single-light window in St. Saviour's, Wood Green, of which the subject is Christ in Majesty.

SANITARY AND ENGINEERING NEWS.

FAIRBURN WATER SUPPLY.—The new water supply for the village of Fairburn, near Pontefract, which has been carried out at a cost of 3,000*l.* from plans prepared by Mr. J. Waugh, C.E., of Bradford, was formally turned on by Mr. J. T. Addy, the representative of the parish on the Pontefract Rural District Council, who received from Mr. Waugh as a souvenir of the occasion a silver flask suitably inscribed. The supply is obtained from what are known as the Gadmire Springs, which are leased at a nominal rent from the Wesley Trustees; the flow from these varies from 150,000 gallons to 1,000,000 gallons per day, and, as Fairburn's population is only 800, the quantity required will absorb only a small proportion of the minimum. The works have been carried out by Mr. J. W. Broadhead, the contractor, and consist of a reservoir of 100,000 gallons, a pumping-station, oil-engine, and pumps, and about two miles of mains.

BELGRAVE SEWAGE PUMPING STATION, LEICESTER.—The formal opening ceremony of the new Belgrave sewage pumping station on the Melton-road, Leicester, took place recently. The works form part of an extensive scheme, and comprise preliminary clarification of the whole of the sewage

of the borough by bacterial treatment at the Beaumont Leys Farm, with its subsequent and final purification on the land; also new sewers and storm outfall works for the whole of the Belgrave district, the abolition of the Belgrave sewage farm, and the construction of this new pumping station and the rising main to deliver the Belgrave sewage to Beaumont Leys Farm for bacterial and land treatment. The estimate for the whole scheme was 167,841*l.* Of this amount about 86,000*l.* was provided for sewerage and sewage disposal works for the Belgrave district. When completed, about nine miles of new sewers will have been laid, which will replace about the same length of old defective sewers. The sewage from a population of about 11,000 will be discharged through the new sewers to the pumping station, representing a volume in dry weather of nearly 400,000 gallons a day. From the pumping station now opened the sewage is delivered through a 16-in. diameter cast-iron rising main, nearly two miles long, to the Beaumont Leys Farm, a rise of about 174 ft., where it joins the sewage from the Abbey-lane main sewage pumping station. Measures have been taken to safeguard the district from nuisance arising from the works, and it will be impossible for any back watering or flooding from the sewers to again take place in the low-lying parts of Belgrave. The new buildings comprise an engine-house, boiler-house, workshop, and chimney-shaft, 120 ft. high. A weigh office has also been built, and a house for the superintendent is now in course of construction. A fence 4 miles long on the eastern boundary of the land, and a belt of trees, 20 ft. wide, will be planted on the eastern and southern boundaries of the site. The bulk of the foundations are 27 ft. below the normal level of the river. Mr. E. G. Mawbey is the Borough Surveyor and Engineer, and Messrs. Samuel & Scott, Ltd., Gloucester, were the contractors.

THE WIDENING OF UNION BRIDGE, ABERDEEN.

—A meeting of the Improvements Committee of the Aberdeen Town Council was held on the 29th ult., when the proposal to widen Union Bridge was again considered. It was decided to request Sir Benjamin Baker to visit Aberdeen, inspect the bridge, and advise the Council before it is decided whether to widen the bridge by granite masonry or simply by throwing out steel girders on either side to support a pavement for pedestrians. There was a majority of opinion in the committee that the widening should be done by masonry if possible.

THE ROYAL SANITARY INSTITUTE.—At an examination in sanitary science as applied to buildings and public works, held in Leeds, June 2 and 3, 1905, one candidate presented himself, Mr. S. S. Rusby (Huddersfield), to whom a certificate was granted. At an examination in hygiene in its bearing on school life, held in Leeds, on June 2 and 3, 1905, twenty-eight candidates presented themselves for Part I, and eighteen for the whole examination. The following twelve candidates were awarded certificates:—Miss S. L. Dewbury; Miss A. M. V. Badock (Leigh); F. Barraclough (Leeds); T. E. Butler (Leeds); Miss R. H. Hargis (Keighley); Miss N. King (Wakefield); Miss F. Kirk (Bradford); Miss S. W. Limont (Burnley); E. Ralphs (Appley Bridge); F. C. Tankard (Bradford); Miss A. Taylor (Wakefield); Miss J. E. Tolson (Dewsbury). The following nine candidates were successful in Part I. of above examination:—Miss M. A. Chappell (Barnsley); T. Olegg (Elland); Miss M. Daken (Liverpool); A. Longbottom (Bradford); W. Kidd (Leeds); T. Oldfield (Knaresborough); Miss F. E. Relf (Shipley); Miss F. Rowbottom (Darton); W. J. Woodruff (Skipton).

FOREIGN.

FRANCE.—A monument has been erected in the Avenue de l'Observatoire, Paris, near the lying-in hospital, to the memory of Dr. Armand Trousseau. The Académie de Médecine has opened a subscription to raise a monument in that town to Jules Verne.—The eleventh local art exhibition has been opened at Pontoise.—An asylum for the aged has been opened at Courbevoie, of which M. Tronchet is the architect.—A competition has been opened at Limoux for the building of an upper-class primary school.—M. André Grand Prix de Rome, has been appointed architect to the Service Municipal à Paris, in place of the late M. Cavel.—MM. Allignet and Loiseau are the architects for important school buildings in progress at Vanves and at Boulogne-sur-Seine.—By a Government decree of May 27 M. Léon Bonnat has been appointed Director of the Ecole Nationale des Beaux-Arts for a period of five years.—The death is announced of M. Blanc, architect,

Inspecteur des Bâtiments Civils, and specially attached to the Institut and the Cour de Cassation.—The decease is announced, at Paris, of M. Henri Prath, a member of the Société Centrale des Architectes. M. Prath, who was 58 years of age, had been brought up in the Atelier André and at the Ecole des Beaux-Arts. He was the architect of various schools at Paris and at Chateau-Renaud, and also of the Ecoles Normales at Loches and at Tours.—M. Eugene Danfouy, architecte-en-chef in the Department of Monuments Historiques and of Edifices Diocésains, has died at Paris at the age of 67. He was a pupil of his father and of Questel. He was successively in charge of the dioceses of Arrignon, Orléans, and Tulle. In 1899 he obtained the Grande Médaille of the Société Centrale, founded to encourage studies on French architectural monuments.

GERMANY.—The Society of German Engineers will hold its annual meeting at Magdeburg on June 19 to 22.—In Ratibon, when a house was pulled down in St. George's-place, some interesting remains of a wall were discovered that must have belonged to the Castra Regina erected in the time of Marcus Aurelius, 179 A.D.; remains of a statue were also found, of a female figure of which the head and shoulders are missing, and which has been purchased by the Imperial Museum, in connection, to represent Agnes of Poitiers, the wife of Emperor Henry III.—The new building for students of mechanics, built in connexion with the Dresden Technical Schools by the architect, Professor Weissbach, was opened on May 27.

ANTWERP IMPROVEMENTS.—At a recent meeting of the Conservators of the River Thames, arrangements were made for a visit by members of the Board, during the current month, to Antwerp, Rotterdam, and Hamburg, to inspect the new works for the improvement of the Port of Antwerp, which it is estimated will cost 10,000,000 francs. The works consist of an outfall of about eight millions sterling. The projected improvements comprise a river channel, four and a quarter miles long, from Kruisschans to Austruvel to provide riverside quays and quay-space extending over eight miles; the construction of two dams at the upper and lower ends, respectively, of the head to be superseded by the new river channel, with a short canal and locks joining the main river and the northern end of the enclosed bend; and a dock canal, having at its northern end three parallel locks, 984 ft. by 98 ft. and 26 ft. deep at low water, to communicate with the river at Kruisschans. The locks and canal are 1 miles in length and 820 ft. in width, to join the new docks now being built, and will have nine open transverse docks, 3,936 ft. by 656 ft., with a water depth of 39 ft.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. A. E. Carey, M.Inst.C.E., has acquired the practice of the late Mr. William Jeffrey, which he will carry on at the same address, 3, Victoria-street, S.W.—Messrs. R. J. Nicholson & Co., 26, Cannon-street, Manchester, have been appointed sole agents in Manchester and the district for Messrs. Joseph Richmond & Co.'s lifts and cranes.

PROPOSED RECONSTRUCTION OF THE TOWN HOUSE, ABERDEEN.—The sub-committee of the Finance Committee of the Aberdeen Town Council, charged with the scheme for the reconstruction of the Townhouse Buildings, met on the 18th ult., when the plans, prepared by the Burgh Surveyor, following the elevation prepared on a previous occasion by Mr. A. Marshall Mackenzie, A.R.S.A., were submitted. The sub-committee agreed to report the plans simpliciter to the Finance Committee, with the statement that the plans now prepared meet the requirements of the various departments of the Town Council. Under the scheme, the proposal is to take down the north wing of the townhouse and set it back so that the line, when projected to Queen-street, would run in line with the railing of the Marischal College Buildings. Offices for the public rates and gas departments would be provided in the wing facing Broad-street, while the City Chamberlain and his staff would be accommodated on the first floor, and the Town Clerk's department on the floor above. The front portion of the Municipal Buildings to Union-street would also require to be reconstructed. The ground floor is intended to be occupied by the Tramway Department, and the first floor by the Public Health Department. On the next floor it is proposed to enlarge the town hall—to form a hall, with rooms for the use of the councillors and committees. The estimated cost of the scheme is about 35,000*l.* This sum is exclusive of the cost of the acquisition of the Society of Advocates' Hall and other property in Broad-street. In the event of the Council purchasing

Advocates' Hall, the Burgh Surveyor's office would be accommodated in that building when reconstructed.

CHANCEL SCREEN, ILHAM.—Ilham St. Mat. Church, Torquay, was erected half a century ago from the designs of the late Mr. Salvin, a London architect. In 1895 alterations and additions were made by the late Mr. Pearson, R.A. A clearestory was put in and covered with an open-timbered roof, and the body of the fabric was fitted with oak panelling, and now a new chancel screen has been erected from the designs of Mr. Charles Pearson, F.S.A. The work of erection was entrusted to Messrs. A. B. Hayward & D. C. Maynard, architects, of London. Supported upon stone corbels from each side, and beneath the great roof beam is carried the out-stretched wings of sculptured pine, nearly life size, and whose pinions, when tip to tip of the beam is a Calvary cross, upon its upper part a crown of glory, which beneath is carved a descending dove. Above the cross is a projecting canopy head, in outline, crocketed, and terminating in a carved finial. Springs up from the canopy and covering all the eastern end of the choir, the tracery of XVth century type, whilst below occur, upon the northern side, the pelican in her piety, and upon the north a cross with foliated ends, upon which is a circle composed of three stars. The carrying out of the work was entrusted to Messrs. Harry Hems & Sons, Glasgow.

SHOREDITCH TOWN HALL.—The Shoreditch Town Council have appointed Mr. Alfred S. Cross as architect for the restoration of the town hall, recently injured by fire. The new hall was built in 1901 by Messrs. Kilby & Co., and Mr. Cross's plan of the hall, which was chosen in a limited competition, and is illustrated in our number of October 19, 1901. The general design of the facade was brought into consonance with the architectural outline of the adjacent and vestry hall. The fire broke out in the early morning of August 15, 1904, destroying the whole of the roof, and the interior of the hall. The structural reconstruction cost an estimated sum of nearly 20,000.

THE CHAP COTTAGES EXHIBITION.—This Exhibition has received from the Board of Trade a certificate as an Industrial and International Exhibition. If, therefore, exhibitors give notice to the Comptroller, they can avail themselves of the protection afforded by the Patents, Designs, and Trade Marks Act, 1883, for inventions, designs, etc., which they exhibit.

BUILDING BY-LAWS, PUDSEY.—A meeting of the members of the Pudsey Town Council was held on the 5th ult., the Mayor (Alderman Barrett) presiding, when Alderman Webster proposed that the Commission of H.M. Works intend, which he said, make it easier for builders to erect houses and shops at a paying price. The main alterations were in reducing the strength of timbers, easing the conditions for lock-up shops, and providing that the height of rooms should be not less than 8 ft., instead of 9 ft. Mr. Hunt opposed the new provisions relating to timbers and height of rooms. It was better, he said, to err on the safe side, and the Council would perhaps rue when it was too late.—Alderman Walker stated that that these two provisions had been passed by the Local Government Board.—Mr. Webster expressed regret that the Council had not obtained the power to erect scullery houses that could be let at about 4s. 6d. per week. He was erecting large numbers of such houses, and people were leaving Pudsey to live in them. The by-laws were approved.

STOVES OR FIRE GRATES.—We are requested to state that the Commissioners of H.M. Works intend, with the assistance of the Coal Trade Abatement Society, to carry out during the autumn a series of tests of open domestic fire grates. Manufacturers who may be anxious of having stoves tried should send full particulars thereof addressed to The Secretary, H.M. Office of Works, L. Cotton, S.W., on the 15th of which the Commissioners will determine whether such stoves shall be submitted for tests. Applications must be received not later than July 7 next.

RENTS FIRE PREVENTION COMMITTEE.—Mr. David C. Wyllson, F.R.I.B.A., has been elected a member of the Executive of the Rents Fire Prevention Committee, vice Mr. Pritchett, F.R.I.B.A., deceased. Lieut.-Colonel Winn, R.E., Mr. Walmisley, M.A.C.E., and Mr. Frank Macey, architect, have been elected to seats on the General Managing Arrangements Sub-Committee. The next fire tests at the British Fire Prevention Committee's new testing station will be completed on Wednesday, June 23, and there will probably be a private view of the testing

station prior to the tests. In addition to the tests already announced, a test is to take place in respect to protective coverings to stoves, the protective coverings being constructed by Messrs. Jabez Thompson, of Northwich. An arrangement has been made by the Committee with the Associated Portland Cement Manufacturers, Ltd., for systematically testing the fire resistance of various aggregates of cement concrete, and a special announcement will shortly be made as to the aggregates that will be under review.

BUILDERS' EXCHANGE, BIRMINGHAM.—Work in connection with the Builders' Exchange and Exhibition, Birmingham, is progressing favourably; the opening day is fixed for June 29, and should find all in readiness for the display of nearly every conceivable material and appliance required in the building of houses and factories. The motto of the Exchange is "A house is not finished until it is furnished," and, in furtherance of this view, complete schemes of furnishing houses and offices will be shown. A system has been arranged whereby immediate reference may be made to the most important catalogues of leading firms concerned in the erection and equipment of buildings, and a plan has been adopted to keep the Builders' Exchange supplied with all the newest publications. The following are among the firms who are exhibiting:—Messrs. Melowes & Co., Ltd. (Sheffield); The Wood Carving Company (Birmingham); Hamblett's Blue Brick Company (West Bromwich); Messrs. Phillips & Sons (Birmingham); The Cannon Iron Company (Dessford); The Perfect Window Company, Ltd. (Nottingham); Messrs. English Brothers (Widobch); The Haunchwood Brick and Tile Company (Nuneaton); Messrs. Yarrow & Co. (Bolton); Mr. Albert J. Shingleton (London); The Fire Resisting Corporation (London); Messrs. Kenrick & Jefferson (West Bromwich); Kodak, Ltd. (London); Messrs. May & Co. (Jackfield); Messrs. Kaye & Co. (Rugby); The Cloisonné Glass Company (London); Messrs. Samuel Platt (Wednesbury); Mr. Geo. Farniloe (London).

CAPITAL AND LABOUR.

NEWCASTLE BUILDING TRADE DISPUTE.—Some misunderstanding appears to have arisen with the labourers on strike in Newcastle and district as to the proposals of the masters. They had expected to receive these direct from the employers after the meeting of the latter on Friday, last week, but have not done so. However, it appears they have received a letter from Mr. Leeson, in which were stated the suggestions of the employers, and they are now inquiring whether this is meant to be the official communication. In this letter, as has been already stated, the employers ask for a reduction of 3d. per hour, or, failing that, that the men should accept the old rate of 5d. and refer the whole matter to arbitration. When the labourers hear that these are the official terms they will proceed to ballot on them. We are informed that, as a matter of fact, the labourers and the masters have already, at their conference, practically come to an agreement on the working conditions, and the real question now at issue is that of wages. This appears also to be the chief matter in dispute with the plasterers and bricklayers. We also understand that, should the plasterers return to work, they will request that all the men who have been employed in their trade during the strike shall be discharged.—The masons have returned to work, having effectually settled their differences with the employers. As a result of a conference between the masters and the joiners, mutually satisfactory terms have been decided upon. At the meeting Mr. Stephen Easton presided, and, after a somewhat prolonged discussion, concessions were made by each side. A reduction of 3d. an hour was agreed to, so that the joiners' wage is 9½d. per hour, and equal to that which the masons have accepted. Several other matters were also dealt with, but in each a compromise was arrived at, and thus two of the five trades concerned have definitely settled matters.—*Newcastle Chronicle.*

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

15,650 of 1904.—S. SAUNDERS: Ventilators. A ventilator, consisting of a fixed half having a bearing, a sliding half provided with a spindle or part engaging with the bearing, such sliding half having also a web or flange or guides guiding the in-and-out movements of the sliding half relative to the fixed half.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

the said bearing being cored out for the spindle way and having a thin tube or liner of brass or other anti-friction metal smaller in diameter than the bore in the bearing, and an annular space between the liner and the bore filled with lead.

21,326 of 1904.—D. F. AINSLIE: Window Sash Fittings.

Window sash fittings, consisting of a plate suspended to the sash cord, and carrying a locking bolt, a keeper secured in the parting bead groove, and a disengager secured on the sash style, a guide, temporary hinges, a pivot, a movable plug for operating the same, and metal lined holes in the sash and pulley styles, said movable plug secured to the end of the sash cord, and formed with a notched disc and connecting stem in combination with a key.

23,871 of 1904.—O. H. SCHWAB: Flooring Blocks, or Slabs for Building Purposes.

Flooring slabs so made that, after they have been laid in pairs between the iron girders, each slab will lie with its outer side on the lower flange of a girder, while its inner crown ridge will lie in such a way that the two slabs bear against each other, and are able to sustain weight, such slab being made with a hollowed part on its upper side and with cross-strengthening ribs made in one piece with the slab, a crown-piece furnished with a hollow which enables the two slabs of a pair to be set in from above, and after the two have been thus set in, the hollow of the one slab with the corresponding hollow of the other slab in form, on the underside, a groove which can be made tight with a filling of cement.

2,591 of 1904.—D. ROBINSON: Ventilators.

A ventilator, consisting in the combination of a hollow spherical body having oppositely-disposed circular side openings, a piping to which it is attached, which projects up into said body, a cross-bar passing through said body and suitably supported therein, the ends of which project from the side openings thereof, and circular concavo-convex weather-guards or shields supported by said cross-bar in front of said side openings, but sufficiently removed therefrom to provide exit passages.

11,332 of 1904.—E. HANCOX: Girders or Beams.

This invention relates to the construction of girders or beams, and other structures of a like nature, and are built up of sections or units, of metal plates having thickened or double-flanged edges, or projecting parts thereof, and connected together by strips of metal or sections having suitable grooves or channels provided for receiving and gripping the thickened edges or projecting parts of the metal plates. Having thus brought the grooves or channel-shaped sections and the thickened edges of the plates together, the arms, outer edges, or lips of the said grooved or channel-shaped sections are then bent down behind the projecting parts or thickened edges of the plates, and in this manner form a strong and durable connexion of the various parts.

15,042 of 1904.—G. NEWHOUSE: Apparatus for Applying the Smoke Test to Drains and the like.

Apparatus for applying the smoke test to drains and the like, comprising a smoke chamber surrounded by a water-jacket, and having below a false bottom for smoke-producing material, an air compressor mounted on the jacket, and arranged to supply air to the underside of said perforated false bottom to the smoke chamber, and a handle or sling secured upon the jacket whereby the apparatus may be carried, a non-return valve to a coned outlet from said chamber, and a perforated support in said chamber.

15,645 of 1904.—J. DOUGLAS and W. CHRISTIE: Adjustable Shore or Strut for Use in Supporting the Sides of Earth Trenches and the like Excavations while under Construction.

This invention relates to an apparatus for use in supporting the sides of earth trenches and the like excavations while under construction. The principal object of the invention is to provide a portable and adjustable apparatus for the purpose, for use in place of the ordinary wood shores or struts. According to the invention shores are provided that can be used over and over again and that can be quickly adjusted to any reasonably-desired length, corresponding to the width between the sides of the trench, and simply fixed in place, and as easily disconnected for use elsewhere. The apparatus consists mainly of a tube, in each end of which is fitted a sliding rod or piston. The rod at one end of the tube can be adjusted lengthwise therein so as to project more or less from the end of the

tube, and can be fixed in the desired position by passing a pin through the sides of the tube, and any one of a number of holes provided in the rod, at convenient distances apart for the purpose. The sliding rod at the other end of the tube is moved in and out of same by means of a lever pivoted on the top of the tube, and the lower sash-arm of the lever engages with this rod in the tube, so that upon manipulating the lever handle the rod is slid in and out of the tube as desired. This rod is provided with a toothed rack, and a pawl mounted on the tube is arranged to engage with the rack, so as to hold the rod in the required position. The outer end of each sliding rod is provided with a pawl, the face of which is spiked.

17,870 of 1904.—S. ELMS: *Artificial Stone, Plaster, or Plastic Material.*

This invention relates to the manufacture of artificial stone, plaster, plastic material for building purposes. The object of the invention is to produce a material which shall represent as nearly as possible the natural stone, and for this purpose a labaster powder or combined with powdered or ground natural stone in approximately the proportions of three parts of plaster to one part of powdered stone. To this mixture a small percentage of borax or alum is added for hardening purposes.

23,880 of 1904.—J. W. SHORR: *Machines for Manufacturing Hollow Building Blocks.*

A machine for forming building blocks, consisting in the combination with a support, a frame journaled thereon embodying the open bottom and a vertically extending side, a mould-box side-piece supported on the side of the frame, and a mould-box bottom arranged in the open bottom of the frame, and provided with projections adapted to engage therewith, a clamping device adapted to secure the bottom to the frame, a second mould-box journaled on the bottom, and stops for limiting its outward movement, and boards co-operating with the side-pieces and locking devices for holding the parts of the mould-box in operative position.

5,157 of 1905.—J. J. DENNIS and E. T. FILER: *Scaffold Bracket.*

This invention relates to a scaffold bracket suitable particularly for the use of painters, paperhangers, and the like, and has for its object to provide a simple and effective bracket which can be used to support a staging board at any height desired. The bracket comprises a rectangular frame formed of side bars and an end plate. Between the side bars, and extending from one plate to the other, is the middle bar. These bars are preferably angular in cross-section, and the whole device is preferably cast or made in one piece. The middle bar occupies a plane somewhat lower than the side bars, the end plates being curved to accommodate the same. One of the side bars has teeth at its inner edge thereof. These teeth project at the ends of the bar, only the middle portion of the bar being plain or not touched. The edge of the middle bar is similarly toothed, and has a plain middle space. The teeth so arranged are adapted to engage in and support the bracket on a plank or upright, a wide plank being most suitable for the purpose. The plank is inserted between the teeth on the respective bars, and weight or pressure on the bar will cause the teeth to engage the plank and hold the bracket at the place set.

5,854 of 1905.—J. G. F. LUND: *Building Blocks with Metal Skeletons.*

This relates to moulded or pressed hollow construction blocks, and consists in placing iron bands or wires outside the construction mass in such a manner that the shearing stresses appearing in the tongue and groove projections are transmitted as tension to the main flanges of the blocks by means of the iron parts. One iron band is carried from the bottom edge of the tongue through the upper main flange to the bottom edge of the lower groove projection, and the next iron band is carried from the upper edge of the tongue through the lower main flange to the top edge of the upper groove projection.

6,555 of 1905.—K. PITROWSKI: *Hollow Clay Bricks or Artificial Stones and the like.*

This invention relates to hollow bricks or artificial stones of any size in the shape of headers and stretchers which are provided with hollow spaces or channels running through them in a horizontal direction, and being provided on the end faces, between the horizontal channels, with grooves which face each other in the bond and form vertical channels, which are filled with mortar for the purpose of making the masonry air and water tight, and preventing the mortar from entering the channels.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the author.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

May 19.—By DYER, SON, & HILTON (at Lewisham)	
Calford.—30, Silvermere-rd. (s.), l. y. r. 364.	5585
25 and 26, Nelgrave-rd., l. y. r. 561.	750
101 and 103, Bragade-rd., l. y. r. 571 & 581.	590
Lewisham.—60, Ellersdale-st., u.t. 65 yrs., gr. 81, y. r. 254.	255
38, Thurston-rd., u.t. 68 yrs., gr. 21, 101, y. r. 321.	226
Lee.—32 and 14, Eton-gr., u.t. 21 yrs., gr. 91, y. r. 681.	400
Blackheath.—Southvale, u.t. 68 yrs., gr. 91, y. r. 381.	280
May 25.—By ALEX. MOSSMAN (at Uxbridge)	
Hayes, Middx.—"Rosedale Farm," 4 a. 1 f. 22 p. l. y.	1,775
Uxbridge, Middx.—Bridge-rd., "Dunstable" and "Leighton" Villas (four), l. y. r. 881 & 882.	1,190
May 29.—By F. ELLIN & SON	
Brimpton, Berks.—"Brimpton Common Farm," 81 a. 0 r. 18 p. f.	2,000
By ELLIOTT, SON, & BOYTON.	
Marplebone.—24, Nottingham-pl., u.t. 41 yrs., gr. 364, y. r. 2334.	2,650
Cholsey, Berks.—"Mill Court Estate," 42 a. 3 r. 6 p. f.	12,000
Maldenhead Thicket, Berks.—"Kinneys Green," "Fernhurst," and 74 a. f.	3,600
By KEMSELEY.	
Spitalfields.—17 and 18, Freeman-st., l. y. r. 851, 104.	1,080
4, Palmer-st., l. y. r. 428.	540
By MATTHEWS, MATTHEWS, & GOODMAN.	
Battersea.—254, Lavender-hill (s.), u.t. 81 yrs., gr. 271, 105, y. r. 1551.	2,100
By MERVIN & ADAMS.	
Clapton.—2, 4, 6, and 8, Macdonald-st., u.t. 75 yrs., gr. 201, y. r. 1101, 105.	580
By SEDGWICK, SON, & WEALE.	
Willesden.—Lansdowne-gr., l. g. rents 241, reversion in 51 yrs.	585
By F. VARNER.	
Paddington.—1, 2, and 3, Goldney-pl. (factory), u.t. 674 yrs., gr. 104, r. 1001 (including plant and machinery).	700
Tottenham.—1, 2, and 3, Rypp-rd., u.t. 801, y. r. 1051, 88.	500
By WESTON & SONS.	
Stockwell.—30, 34, and 38, Sidney-rd., u.t. 37 yrs., gr. 132, 105, y. r. 102.	750
7, 8, and 9, Herbert-rd., u.t. 46 yrs., gr. 181, 105, 64, y. r. 1161.	1,035
Brixton.—1 and 3, Burton-rd., y. r. 901, also l. g. 145, gr. 138.	1,015
36, Lorn-rd., u.t. 29 yrs., gr. 61, y. r. 421.	340
By T. WOODS.	
Kentish Town.—3, Hawley-cres., u.t. 23 yrs., gr. 41, 104, y. r. 321.	180
By E. FEAR & WALKER (at Winchester).	
Winchester.—16, Bridge-st. (s.), l. y. r. 801.	995
15, Bridge-st., l. y. r. 201, 105.	270
2 and 8, Chacehill-at. (Cheesehill Rectory), l. y. r. 181, 48.	445
55, Hyde Abbey-rd., u.t. 976 yrs., gr. 21, 25, r. 231.	585
By WINTERTON & SONS (at Tamworth).	
Ilford, Staffs.—"Upfields Farm," 98 a. 1 r. 26 p. l. y. r. 1401.	3,700
May 30.—By BROWNE & TAYLOR.	
Newington.—Avonmouth-st., etc., l. g. 51, 28, u.t. 84 yrs., gr. 41, with reversion.	470
Peckham.—Sunset-rd., etc., l. g. 161, u.t. 994 yrs., gr. 11, with reversion.	470
By MARTIN, CLARKE, & CO.	
Trusthorpe, Lincs.—"Trusthorpe Manor" and 48 acres, l. y. r. 801.	1,200
Eglington, Beds.—"Langley Cottage," l. y. r. 801.	1,600
By RUTLEY, SON, & VINE.	
Hampstead-road.—9, Edward-st., u.t. 104 yrs., gr. 61, p.	380
Kentish Town.—25 and 26, Chacehill-st., u.t. 324 yrs., gr. 61, y. r. 901.	765
14, Leybourne-rd., u.t. 224 yrs., gr. 61, 105, r. 341.	210
St. John's Wood.—93, Boundary-rd. (s.), u.t. 45 yrs., gr. 91, 105, y. r. 501.	835
Kenal Rise.—45, Ravensworth-rd., u.t. 794 yrs., gr. 61, 105, y. r. 371, 145.	230

Barnes.—146, Castelnau, u.t. 34 yrs., gr. 81, y. r. 551.	84
105, Castelnau, u.t. 34 yrs., gr. 101, y. r. 701.	4
By F. WARMAN.	
Islington.—26, Cleveland-rd., u.t. 47 yrs., gr. 61, y. r. 321, 124.	4
Holloway.—16, Poyning-rd., u.t. 65 yrs., gr. 51, 105, r. 361.	1
Finbury Park.—317, Green-lane, u.t. 61 yrs., gr. 81, 44, r. 101.	2
Horsey Rise.—164, Hanley-rd., u.t. 614 yrs., gr. 81, r. 501.	1
By DRAWBRIDGE & ANSELL (at Lewes).	
Plumpton, Sussex.—"Well House" (poultry farm) and 0 a. 2 r. 26 p. c.	8
Alfriston, Sussex.—The King's Ride, six enclosures of freehold land, 28 a. 1 r. 27 p. (in 104).	8
By VENTON, BULL, & COOPER (at Newmarket).	
Mildenhall, Suffolk.—"The Hall" and 14 acres, l. y. r. 801.	1,1
By ROBERTS, SON, & FOX (on the premises).	
Bourton, Dorset.—"Highfield" and 8 a. 0 r. 9 p., also two cottages, l. y. r. 801.	1,3
By W. H. WINCH & SONS (at Ashford).	
Benedict, Kent.—"Bishopdown Farm," 59 a. 2 r. 31, 44, r. 21, 101.	2,0
"Hoad's Brook Farm," 20 a. 2 r. 21 p. l. y. r. 801.	2,0
By BIDDERSON, Kent.—"The Paine Land," 8 a. 39 p. l. y. r. 801.	1,3
"Summerhill Farm," 14 a. 0 r. 26 p. l. y. r. 801.	1,3
"Rat's Castle Farm," 14 a. 0 r. 26 p. l. y. r. 801.	1,3
"Upper" and "Lower Brooke's Wood," 137 a. 3 r. 21 p. l. y. r. 801.	1,3
"Birch Wood," 32 a. 2 r. 2 p. l. y. r. 801.	1,3
"Toll Gate Cottage" and 0 a. 0 r. 16 p. l. y. r. 801.	1,3
Fritland, Kent.—"Amman" and 10 a. 0 r. 21 p. l. y. r. 801.	2,3
Headcorn, Kent.—"The Wick Hill Land," 53 a. 0 r. 8 p. l. y. r. 801.	2,3
May 31.—By CHARLES CLAY.	
Camberwell.—89, Camberwell-gr., l. y. r. 401.	4
By R. TIDY & SON.	
Kingland-road.—Nos. 423, 426, 427, and 429, u.t. 201 yrs., gr. 84, y. r. 801.	1,1
By THURGOOD & CO. (at T. H. T.).	
Tebey, Westmorland.—"Daniel Hill" and "Low Scales" Farms, 111 a. 2 r. 28 p. l. y. r. 801.	2,4
By HALL, WATERIDGE, & OWEN (at Shrewsbury).	
Rushbury, Salop.—The Stadway Manor Estate," 451 a. 0 r. 30 p. f.	12,000
By MADDISON, MILES, & MADDISON (at Yarmouth).	
Belton, Suffolk.—A freehold and copyhold farm, 42 a. 1 r. 17 p.	1,5
A copyhold meadow, 0 a. 3 r. 10 p.	1
Four fresh air building sites, 3 a. 0 r. 27 p. A freehold house and 1 a. 0 r. 0 p.	1
Ormsby St. Margaret, Norfolk.—A small holding, 4 a. 3 r. 0 p. f.	1
Enclosure of 1 a. 0 r. 0 p. f.	1
June 1.—By BALCH & BALCH.	
Camden Town.—109, Camden-rd., with stabling, u.t. 32 yrs., gr. 61, 105, p.	70
By ALFRED BOWYER.	
Enfield.—Clay-hill, "King's Oak Farm," 48 a. 3 r. 18 p. l. y. r. 801; also eight cottages, y. r. 721, l.	3,000
Clatland.—Clay-hill, "King's Oak Farm," 48 a. 3 r. 18 p. l. y. r. 801; also eight cottages, y. r. 721, l.	3,000
Horsey.—58, Hampden-rd., u.t. 794 yrs., gr. 71, 105, y. r. 841.	2
By FAREBROTHER, ELLIS, & CO.	
Preston Candover (Hants.).—"North Hall Estate," 439 a. 2 r. 29 p. f.	6,700
Enclosures of woodland, 774 a. f.	2
A small holding, 8 a. 8 r. 6 p. part l. and part 961 yrs., gr. nil.	3
A freehold holding, 3 a. 1 r. 0 p. f.	3
The "Purocy Arms" p.h., l. y. r. 401.	3,1
Freehold shop and three cottages, y. r. 201.	0
The school house, residence, and cottage, area, 4 a. 2 r. 27 p. f.	1
By HUNTER & HUNTER.	
Kensington.—49, Palace Gdns.-ter., u.t. 49 yrs., gr. 151, p.	1,1
Holloway.—82 and 84, Queensland-rd., u.t. 28 yrs., gr. 101, y. r. 721, 105.	2
By NEWBORN, EDWARDS, & SHEPHERD.	
Hampstead-road.—84, George-st., u.t. 144 yrs., gr. 61, y. r. 601.	2
Caledonian-road.—No. 531, u.t. 614 yrs., gr. 91, y. r. 521.	8
Tottenham.—69, Lawford-rd., u.t. 201.	8
By SLADE & BUTLER.	
Islington.—154 and 156, Upper-st. (shop and flats), l. y. r. 3951.	5,700
By SLADE & BUTLER.	
Ilford.—10, Christchurch-rd., u.t. 95 yrs., gr. 71, y. r. 361.	2
By SIMMONS & SONS.	
Southwark.—76, Union-st. (s.), l. y. r. 451.	7
10, 20, and 21, East 148.	7
Peckham.—137 and 157, Lower Park-rd., l. y. r. 721, 105.	7
77, Peckham-rd., l. y. r. 421.	7
Camberwell.—20 to 34 (even), Chilwell-st., l. y. r. 2101, 148.	2,1
Mitcham, Surrey.—1 to 6, Bunacre's Cottages, l. y. r. 814.	2
Old Kent-road.—22 and 24, Devonshire-st., u.t. 644 yrs., gr. 111, 138, 44, y. r. 871, 28.	5
Peckham.—139, Asylum-rd., l. y. r. 401.	5
East Surrey-gr., l. g. 61, reversion in 25 yrs.	2
Camberwell.—30 and 32, Wells-pl., u.t. 134 yrs., gr. 61, 105, y. r. 421.	4
Sydenham.—Kent House-lane, l. g. 104, 105, reversion in 92 yrs.	4
Fulham.—Aspen-lane, l. g. 61, 68, reversion in 94 yrs.	1
Clapham.—185 and 187, Bedford-rd., u.t. 164 yrs., gr. 61, y. r. 841.	1
87 and 89, Cottage-gr., u.t. 404 yrs., gr. 61, y. r. 541.	1

LEAD, &c. (continued).—			
	Per ton, in London.	£ s. d.	£ s. d.
Zinc—Sheet.....	30 5 0	..	..
Ville Montagne.....	30 0 0	..	..
Silvan.....	30 0 0	..	..
COPPER—			
Strong Sheet.....	0 10 0	..	..
Thin.....	0 10 0	..	..
Copper nails.....	0 10 0	..	..
BRASS—			
Strong Sheet.....	0 0 9	..	..
Thin.....	0 0 10	..	..
Tin—English Ingots.....	0 1 4	..	..
Solder—Plumbers'.....	0 0 6	..	..
Tinmen's.....	0 0 8	..	..
Blowpipe.....	0 0 9	..	..

ENGLISH SHEET GLASS IN CRATES.

	24 in. per ft. delivered.	£ s. d.
15 oz. thirds.....	3d.	..
fourths.....	2d.	..
21 oz. thirds.....	3d.	..
fourths.....	3d.	..
26 oz. thirds.....	4d.	..
fourths.....	3d.	..
32 oz. thirds.....	5d.	..
fourths.....	5d.	..
Fluted Sheet, 15 oz.....	4d.	..
21 oz.....	4d.	..
Hardley's Rolled Plate.....	2d.	..
24.....	2d.	..
26.....	2d.	..

OILS, &c.

	per gallon	£ s. d.
Raw Linseed Oil in pipes.....	0 1 9	..
Boiled.....	0 2 0	..
in drums.....	0 1 11	..
in pipes.....	0 2 0	..
in drums.....	0 2 2	..
Turpentine, in drums.....	0 5 4	..
Genuine Ground English White Lead.....	19 15 0	..
Red Lead, Dry.....	19 15 0	..
Best Linseed Oil, Putty.....	per wk. 0 4 6	..
Stockholm Tar.....	per barrel 1 13 0	..

VARNISHES, &c.

	per gallon.	£ s. d.
Fine Pale Oak Varnish.....	0 8 0	..
Pale Copal Oak.....	0 10 6	..
Superfine Pale Elastic Oak.....	0 12 6	..
Fine Extra Hard Church Oak.....	0 10 0	..
Superfine Hard-drying Oak, for seats of Churches.....	0 14 0	..
Fine Elastic Carriage.....	0 12 6	..
Superfine Pale Elastic Carriage.....	0 18 0	..
Fine Pale Maple.....	0 18 0	..
Finest Pale Durable Copal.....	0 16 0	..
Extra Pale French Oil.....	1 1 0	..
Eggshell Plating Varnish.....	0 18 0	..
White Copal Enamel.....	0 10 6	..
Extra Pale Paper.....	0 12 0	..
Best Japan Gold Size.....	0 10 6	..
Best Black Japan.....	0 16 0	..
Oak and Mahogany Stain.....	0 9 0	..
Brunswick Black.....	0 8 6	..
Berlin Black.....	0 16 0	..
Kiln-drying.....	0 10 0	..
French and Brush Polish.....	0 10 0	..

* In consequence of a contributor's letter being overlooked, the price of turps was not corrected last week as it should have been.

PUBLISHER'S NOTICES.

Lat. Tel., 612, Gerrard. Telegrams, "The Builder, London."

THE INDEX (with TITLE-PAGE) for VOLUME XLVII. (July to December, 1904) was given as a supplement with the issue for January 14 last.

CLOTH CASES for Binding the Numbers 1 to 12, price 2s. 6d. each; also

READING CASES (Cloth), with Strips, price 8d. each.

THE EIGHTY SEVENTH VOLUME of "The Builder" (bound), price Twelve Shillings and Sixpence.

SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 3s. 6d. each.

CHARGES FOR ADVERTISEMENTS.

COMPETITIONS, CONTRACTS, AND NOTICES ISSUED BY CORPORATE BODIES, COUNTY AND OTHER COUNCILS, PROSPECTUSES OF PUBLIC COMPANIES, SALES BY TENDER, LEGAL ANNOUNCEMENTS, &c., &c.

Six lines or under..... 6s. 6d.
Each additional line..... 1s. 6d.

SITUATIONS VACANT, FELLOWSHIPS, APPRENTICESHIPS, TRADE AND GENERAL ADVERTISEMENTS.

Six lines (about thirty words) or under..... 4s. 6d.
Each additional line (about ten words)..... 6s. 6d.

Terms for series of Trade advertisements, and for front page, and other special positions, on application to the Publisher.

SITUATIONS WANTED (Single-handed—Labour only).
Four lines (about thirty words) or under..... 2s. 6d.
Each additional line (about ten words)..... 6s. 6d.

PREPARATION IS ABSOLUTELY NECESSARY.

* Stamps must not be sent, but all sums should be remitted by Postal Order, payable to J. MORRIS, and addressed to the Publisher of "THE BUILDER," Catherine Street, W.C.

Advertisements for the current week's issue are received up to THREE O'CLOCK P.M. on THURSDAY, but "Classification" is impossible in the case of J. MORRIS, and addressed to the Publisher of "THE BUILDER," Catherine Street, W.C.

ALTERATIONS IN STANDING ADVERTISEMENTS OR ORDERS TO DISCONTINUE same must reach the Office before TEN O'CLOCK on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTS, MOUNTS, &c., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES only should be sent.

PERSONS advertising in "THE BUILDER" may have Replies addressed to the Office, Catherine Street, Covent Garden, W.C., free of charge. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES [By post (carefully packed) 1s.]

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on THURSDAY. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.* unless in some exceptional cases and for special reasons.]

* Denotes accepted. † Denotes provisionally accepted.

ALFRETON.—For alterations and additions to the Wyldie Congregational Church and School, Alfreton. Quantities, etc., by Mr. F. S. Atkiff, architect and surveyor, Draycott, Derby.—
J. T. Brown..... £1,700 0
Harris & Hunt..... 1,684 10
G. Wags..... 1,674 10

BAILDON.—For erecting a villa residence in West-lane. Mr. J. Harper Bakes, architect, Calverley-chambers, Victoria-square, Leeds.—
Messrs.: Taylor & Ellis, Baildon.....
Jesse: A. Parker, Shipley.....
Plumbers: A. Higginbotham & Sons, Idle..... £1,332
Plasterer: W. Holmes, Baildon.....
Roof Tiles: Pickles Bros., Leeds.....

BASFORD (Notcs).—For street works, Chapel-street, Wals, & Raddington, for the Messrs. Conall. Mr. G. W. Hawley, Surveyor, Burton-buildings, Parliament-street, Nottingham.—
D. Roberts..... £1,327 5 3
Bower Bros..... 1,254 8 3
J. E. Dixon..... 1,191 10 11
H. H. Barry..... 1,183 19 7
W. R. Swin..... 1,170 4 0
Bishop & Sons..... 1,159 8 5
T. Smart..... 1,115 5 1

BATLEY.—For new road at Healey, for the Batley Co-operative Society and others. Messrs. C. H. Marriott, Son, & Shaw, engineers, Church-street-chambers, Dewsbury. Quantities by the engineer, Mr. Messrs. Garforth Bros., Old Bank-road, Mirfield..... £2,770 11 4

BISHOP SUTTON (Somerset).—For the reconstruction of offices and latrines, and the execution of certain alterations and renovations at the Council schools, Bishop Sutton, for the Somerset County Education Committee. Mr. W. F. Bird, architect, Midsomer Norton.—
T. Broad & Sons..... £595 0 0
E. Colston..... 632 17 6
Bourne (Lincs).—For erecting fourteen cottages, for Mr. R. A. Collins. Mr. F. G. Shilcock, architect, Bourne.—
G. Hawley..... £2,335 0 0
E. Parker..... 2,000 0 0
Wyke & Sons..... 1,890 0 0
J. H. Clayton..... 1,876 0 0
W. T. Walker..... 1,820 0 0
Hipwell & Co..... 1,755 10 0
Scotney & Co..... 1,715 0 0

BOURNEMOUTH.—For road and surface drainage on the Malnesbury Estate, for the Town Council. Mr. F. W. Lacey, Borough Engineer and Surveyor, Municipal Offices, Bournemouth.—
Grounds & Newton, Richmond-chambers, Bournemouth..... £3,992 6 2

BRADFORD.—For erecting a synagogue in Spring Gardens, Manningham-lane, for the Hebrew congregation. Mr. B. S. Jacobs, architect, Lincoln's in-buildings, Bowdley-lane, Huddersfield.—
J. Totty..... £3,408 0 0
Briggs Bros..... 2,750 0 0
T. Obank & Son..... 2,726 0 0
G. Murray..... 2,725 0 0
W. H. Holroyd..... 2,671 0 0
G. Densin & Son..... 2,628 0 0
Toothill & Balmforth..... 2,603 10 0
B. Fearaby & Son..... 2,526 0 0

BRENTFORD.—For about 840 ft. of 3-ft. brick culvert, etc., together with manholes, lampholes, etc., from the Recreation Ground in Albany-road to a point at the Council's wharf in the town meadow, in the Urban District of Brentford, for Brentford Urban District Council. Mr. Nowell Parr, Engineer and Surveyor, Clifton House, Boston-road, Brentford.—
L. A. Gley..... £1,419 0 0
H. Johnson..... £1,668 0 0
G. G. Bayner..... 1,500 0 0
S. Kavanagh..... 1,489 0 0
T. Watson, jun..... 1,454 0 0
C. W. Kilgus..... 1,420 0 0
back & Co..... 1,420 0 0

BRENTFORD.—For laying a 9-in. pipe sewer, together with manholes, lampholes, lift chambers, etc., from Bolo-lane to Thornesby-edge-road, partly in the Urban District of Brentford, and partly in the Urban District of Acton, for the Brentford Urban District Council. Mr. Nowell Parr, Engineer and Surveyor, Clifton House, Boston-road, Brentford.—
W. Neave & Son..... £3,198 0 0
W. Parker..... 2,568 0 0
T. Watson, jun..... 2,360 0 0
G. G. Bayner..... 2,000 0 0
C. W. Killing-back & Co..... 1,970 0 0
L. A. Gley..... 1,874 0 0 1

BRENTWOOD.—For the proposed conversion of cottages into stables. Brentwood, for Mrs. Spurr. Mr. H. R. Bird, architect and surveyor, Brentwood.—
E. Dix..... £315 5 7
Bridgewater.—Free Library, Bridgewater. Mr. Godfrey Page, architect, 4 and 6, Warwick-coc Gray's Inn, W.C.I.—
G. A. Hayes..... £3,993 0 0
G. Grimes..... 408 10 0
H. A. Forde & Son..... 3,995 0 0
A. Poole..... 3,590 0 0
R. Wilkins & Sons..... 3,580 0 0
H. Flint..... 3,567 0 0
Gleed Bros..... 3,526 0 0
H. Pittard & Sons..... 3,524 0 0
A. E. Donby & Co..... 3,450 0 0

BRIDLINGTON.—For erecting a house, stables, of Midway-avenue, for Mr. J. Smith. Mr. A. T. Mart dale, architect, Bridlington.—
J. H. Fennell..... £499 10 0
G. H. Cornthwaite..... 478 0 0
M. H. Holl..... 432 0 0
Smallwood & Shaw..... 429 7 0
H. Hogard..... 427 8 0
P. Keeshaw..... 412 12 0
T. Spink..... 412 7 0

CABRAU.—For the erection of additions to Coal and Splitters Co-operative Stores, at Cabrau, near Swansea.—
J. Nicholas..... £586 10 0
J. R. Cornthwaite..... 176 0 0
E. Jones..... 495 0 0

CARDIFF.—For erecting a bandstand at Split Pat for the Corporation. Mr. W. Harpur, Borough Engineer, Town Hall, Cardiff.—
McCallum & Hope..... £175 0 0
Lion Foundry Co., Ltd..... 175 0 0
Locke & Wilkin-son, Ltd..... 195 0 0
W. Macfarlane & Co., Ltd..... 151 0 0
M'Dowall, Steven & Co., Ltd..... 205 0 0
H. B. Smith, Brerley Hill..... 173 0 0
W. A. Baker & Co., Ltd..... 160 0 0
J. Boyd & Sons..... 190 0 0
D. King & Sons..... 197 0 0
J. Allan, senr., & Son..... 183 10 0
F. T. Walker..... 193 0 0
Shannon & Chambers..... 193 0 0
Musgrave & Co., Ltd..... 190 0 0
J. A. Law..... 200 0 0

CARLETON.—For children's homes, Carleton, near Pontefract, for the Pontefract Board of Guardians. Messrs. Garvill & Pennington, architects, Pontefract and Castleford. Quantities by architects.—
Brick and Stone Work: Walker & Ward, Hill, Pontefract..... £1,007
Carpenters and Joiners Work: G. T. Darnott, Featherstone..... 414
Plumbers' Work: G. Thompson, Park-lane, Leeds..... 270
Slater's Work: S. Harris, Pontefract..... 102
Plasterers' Work: J. Lockwood, Staincliffe, 87
Dewsbury..... 27
Painters' Work: S. Harrison, Pontefract..... 27

CHISWICK (Middlesex).—For the erection of a laundry, Strand-on-the-Green, for Messrs. Camille Simon Ltd. Mr. Walter Bear, architect, Burlington-court Grove Park West, London, W. Quantities by Mr. O. Pease, 16, Clifford's-inn, Fleet-street, E.C.4.—
A. J. Thompson & Co., Ltd..... £7,399 10 0
A. & R. Hanson..... 4,955
G. Andrews & Co..... 6,943
T. G. Minter..... 6,891
T. H. Adamson & Sons..... 6,876

CORBY.—For the erection of a pair of cottages, Corby, for the Kettering Industrial Co-operative Societies Ltd. Messrs. Bird & Batley, architect and surveyor, Kettering.—
R. R. Colyer..... £267 3 0
J. Streather & Son..... 267 3 0
C. & F. Henson..... 616 0 0
Smith & Edmunds..... 608 0 0
H. Judkins..... 5

CUXTON (Kent).—For erecting a new Council school for the Kent Education Committee. Mr. G. H. Bon architect, 284, High-street, Rochester.—
G. Gates, Frindsbury, Rochester..... £2,550

ELGIN.—For erecting a villa in Seald-street. Mr. R. Pratt, architect, Town and County Bank Building, Elgin.—
Mason: J. McPherson, Elgin.....
Carpenters: J. & A. Robb, Rothes.....
R. R. Colyer..... 267 3 0
Slater: A. Davidson & Son, Elgin.....
Plasterer: G. Gray, Elgin.....
Painter: W. Fordyce, Elgin.....

ENFIELD.—For making-up Soham-road, Enfield Lock, for the Urban District Council. Mr. R. Collier Surveyor, Council Offices, Enfield.—
T. Almond & Sons, Ltd..... £540
J. Jackson..... 450

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T. Almond & Sons, Ltd..... £540
J. Jackson..... 450

WIMBORNE—For two extensions of the sewers at West Wymondley, surveyor, Waterloo-road, Epsom:—
Mr. W. T. Woolley..... 238 10
Mr. S. Kavanagh & Co., 2287
Mr. S. Surbiton Hill..... 206
Mr. C. Bean..... 275

PARRINGTON GURNEY (Somerset).—For the erection of a block of four cottages (Tender A) and the execution of certain works in connexion with the cottages (Tender B) at Parrington Gurney, for Mr. Henry Blimham. Mr. W. F. Bird, architect, Hatherly Norton:—
Tender A. Tender B.
W. A. Catley..... 2795 0 .. 5370 0
Gall & Son..... 720 0 .. 570 0
J. Sperring..... 698 0 .. 561 0
J. Fowler..... 670 0 .. 560 0
J. James & Sons..... 650 0 .. 540 0
W. J. Heal, High Littleton..... 598 8 .. 427 5

GRAMPOND (Cornwall).—For alterations and repairs to National School, for the Trustees of the National School, Mr. E. C. Jury, architect, 1, Alma-villas, Treowarren-road, St. Austell:—
Tender A. Tender B.
Mr. A. R. Bennett..... 2200 0
Mr. J. J. Northcott..... 212 0
Mr. F. Bennett..... 205 0
Mr. T. J. Richards, St. Stephen's, Combe, Grampound-road..... 150 0
Mr. R. Tregeuna & Son..... 150 0
Mr. R. Richards, Mount Chivels, St. Austell..... 138 10

HERFORD—For pipe lines, section No. 2, under scheme, for the Corporation:—
T. Fotherby & Co..... 27,568 0 0
Davies, Ball, & Co..... 5,750 15 6
Greaves & Wheeler..... 5,205 15 10
Hardy & Atkinson..... 5,161 18 9
J. Dowdall..... 5,100 8 2
Bair & White..... 4,953 1 10
Holme & King, Ltd..... 4,705 10 0
W. Dunley..... 4,648 8 6
A. E. Nunn..... 4,423 5 4
Annakin..... 3,993 14 11
Kaye Bros..... 3,896 3 11
D. Busby & Son..... 3,571 9 4
R. Barker..... 3,249 0 0
B. Arnold & Son..... 2,844 1 3
J. Brunton..... 2,540 0 0
J. Mackay..... 2,328 5 5
J. Sangwin..... 2,378 3 6
B. Buckley..... 2,081 0 0
E. W. Simpson..... 2,004 9 6
J. Bennett..... 1,512 10 0
Jewett Bros..... 1,454 19 8
C. B. Brebner & Co..... 1,378 19 8
W. Watson..... 1,329 7 6
T. Egan & Son..... 1,292 5 5
T. Young & Son, Wakefield..... 1,240 10 8
C. Parsons..... 1,220 11 4
J. H. Wood..... 1,199 5 7
2,993 0 0

RYDON—For making up Ramsey and Argyle rd. West Hendon, N.W., for the Urban District Council. Mr. S. Slater Grimley, A.M.I.C.E., Surveyor Rydon:—
Ramsey-rd. Argyle-rd.

Made Paving & S. d.	S. d.	a. d.	2 s. d.	2 s. d.
Made Paving & S. d.	1,292 18	824 12 9	2,117 10 11	11
Made Paving & S. d.	1,042 6	677 18 6	1,720 4 6	6
Made Paving & S. d.	1,047 11 0	666 4 0	1,703 15 0	0
Made Paving & S. d.	1,033 9 8	869 6 0	1,904 8 9	9
Made Paving & S. d.	1,010 9 9	654 16 9	1,665 6 6	6
Made Paving & S. d.	978 5 2	627 14 2	1,605 19 4	4

Recommended by Committee for acceptance.

HERFORD—For the construction of a reservoir to hold 10,000 gallons, and for providing and laying out 1,210 yds. of 2-in. cast-iron water mains, with necessary valves, hydrants, etc., for the Newton Urban District Council. Mr. S. Segar, Engineer, West Street, Newton Abbot:—
W. Watson..... 2,628 19 9
G. Hicks..... 520 0 0
J. Ford..... 508 6 7
Exors. of J. Arundel..... 502 0 0
W. T. Stevenson..... 500 0 0
E. Pike, Torquay..... 490 18 0
R. Smith & Co..... 490 9 8
P. Seargeant..... 466 8 0
W. Barwick..... 458 15 1 1/2
Withdrawn.

HEM—For the erection of a country house, Ighite, Mr. G. Randall. Messrs. Bird & Badley, architects, surveyors, Kettering:—
Brown & Son..... 2797 10
C. & F. Benson..... 750 0
W. Rowley & Co..... 750 0
C. A. J. Ball..... 754 0
C. Lewis..... 750 0
Kettering Co-operative Builders..... 744 0

UDON EDUCATION COMMITTEE TENDERS.
Kettering, South Lambeth-road (Improvements to School).

Providing a hall about 51 ft. by 23 ft. for each department; new classroom for each department (boys, girls, 48; infants, 56); two new staircases and lifts for boys' and girls' departments; and two new staircases for infants' department; lavatory for boys' department; cloakrooms, teachers' and head teachers' and stockrooms for each department; redividing,

restepping, etc., certain classrooms in all departments; rebuilding (boys' and girls' offices, and division wall chamber and coal cellars in basement. Heating by low-pressure hot-water apparatus. The revised accommodation on the completion of the improvements will be—Boys, 372; girls, 356; infants, 390; total, 1,118; being a net loss of 54 places:—
J. Grover & Son..... 15,944
W. Downes..... 15,944
C. & H. Higgs..... 15,832
P. Parnham & Zotheringham, Ltd..... 15,723
Lathley Bros..... 15,483
Kilbey & Gayford..... 15,350
Clarke & Breacy..... 15,118
J. Greenwood, Ltd..... 14,950
W. King & Son..... 14,773
J. & C. Bowyer..... 14,587
R. L. Holloway..... 14,548

Recommended for acceptance.
[The estimate of the architect (Education) for the work amounts to £14,234.]

Clapham, Broomwood-road (Iron Buildings).
Mitson & Harrison..... £1,800 0
T. J. Hawkins & Co..... 1,780 10
T. Granger..... 1,754 0
R. Hes, Ltd..... 1,775 0
Humphreys, Ltd..... £1,620 0
L. Leather..... 1,570 0
W. Harbrow..... 1,559 0
J. McMaas, 237, Hammersmith-road..... 1,405 0

Repairs to Schools on Schedule of Prices.

The Tenders of the undermentioned contractors for executing repairs to schools, so far as the buildings only schools (outside the county), at the printed schedule of prices, 1902, as revised by the addendum, dated April, 1905, accepted, each contract to remain in force for a period of one year, and thereafter until determined by three months' previous written notice by either party, to expire at any time:—

	(a) Repairs, measured work.	(b) Sanitary, measured work.	(c) Day work generally.
Battersea..... T. Laphorne & Co., 1, High-street, Lambeth.....	At schedule prices	At schedule prices	At schedule prices
Bermondsey..... W. H. Lascelles & Co., 121, Bunhill-row.....	do.	do.	do.
Bethnal Green, N.E..... do.	do.	do.	do.
Bethnal Green, S.W..... do.	do.	do.	do.
Bow and Bromley..... Langdon & Clark, 3, Grosvenor-road, Ilford.....	At schedule prices	At schedule prices	At schedule prices
Brixton..... W. J. Coleman & Co., 1, Wynne-road, Brixton.....	At schedule prices	At schedule prices	At schedule prices
Camberwell, N..... W. Johnson & Co., Ltd., Bellevue-road, Wandsworth Common	At schedule prices	At schedule prices	At schedule prices
Chelsea..... C. Wall, Ltd., Upperne-road, Chelsea.....	5	5	At schedule prices
City of London..... W. H. Lascelles & Co., 121, Bunhill-row.....	2 1/2	2 1/2	2 1/2
Clapham (group 1)..... E. Triggs, 92, The Chase, Clapham.....	5	5	5
Clapham (group 2)..... J. Garrett & Son, 17, Balham-hill.....	5	5	5
Deptford..... F. J. Gorham, Point-hill, Greenwich.....	3	3	3
Dulwich..... W. Johnson & Co., Ltd., Bellevue-road, Wandsworth Common	5	10	5
Finsbury, C..... W. H. Lascelles & Co., 121, Bunhill-row.....	2 1/2	2 1/2	2 1/2
Finsbury, E..... do.	2 1/2	2 1/2	2 1/2
Fulham (group 1)..... do.	5	5	5
Fulham (group 2)..... C. Leather & Sons, 114, Merton-road, Wandsworth	5	5	At schedule prices
Greenwich..... E. J. Gorham, Point-hill, Greenwich.....	3	3	3
Hackney, C..... W. H. Lascelles & Co., 121, Bunhill-row.....	2 1/2	2 1/2	2 1/2
Hackney, N..... do.	2 1/2	2 1/2	2 1/2
Hackney, S. (group 1)..... do.	2 1/2	2 1/2	2 1/2
Hackney, S. (group 2)..... do.	2 1/2	2 1/2	2 1/2
Haggerston..... do.	2 1/2	2 1/2	2 1/2
Hammersmith..... do.	7 1/2	7 1/2	7 1/2
Hampstead..... G. Neal, Tennyson Works, Willesden-lane.....	10	12 1/2	10
Holborn..... W. H. Lascelles & Co., 121, Bunhill-row.....	2 1/2	2 1/2	2 1/2
Hoxton..... do.	2 1/2	2 1/2	2 1/2
Islington, E..... do.	2 1/2	2 1/2	2 1/2
Islington, N..... do.	2 1/2	2 1/2	2 1/2
Islington, W..... do.	2 1/2	2 1/2	2 1/2
Kennington..... T. Laphorne & Co., 1, High-street, Lambeth ..	At schedule prices	At schedule prices	At schedule prices
Kensington, N..... G. Neal, Tennyson Works, Willesden-lane.....	10	12 1/2	10
Kensington, S..... W. Johnson & Co., Ltd., Bellevue-road, Wandsworth-common	10	12 1/2	10
Lambeth, N..... T. Laphorne & Co., 1, High-street, Lambeth ..	At schedule prices	At schedule prices	At schedule prices
Lewisham (group 1)..... Kirk & Randall, Warren-lane Works, Woolwich.....	5	10	7 1/2
Lewisham (group 2)..... do.	5	10	7 1/2
Limehouse..... Langdon & Clark, 3, Grosvenor-road, Ilford.....	7 1/2	10	7 1/2
Mill End..... do.	7 1/2	10	7 1/2
Marblebone, E..... W. H. Lascelles & Co., 121, Bunhill-row.....	5	5	5
Maylebone, W..... G. Neal, Tennyson Works, Willesden-lane.....	10	12 1/2	10
Newington, W..... W. H. King, 39A, Invillie-road, Walworth.....	5	5	At schedule prices
Norwood (group 1)..... W. Johnson & Co., Ltd., Bellevue-road, Wandsworth Common	5	10	5
Norwood (group 2)..... do.	5	10	5
Paddington, N..... G. Neal, Tennyson Works, Willesden-lane.....	10	12 1/2	10
Peckham..... W. H. Lascelles & Co., 121, Bunhill-row.....	5	5	5
Poplar..... do.	5	5	5
Rotherhithe..... do.	5	5	5
Strand..... do.	2 1/2	2 1/2	2 1/2
St. Geo.-in-the-East..... do.	2 1/2	2 1/2	2 1/2
Stepney..... do.	2 1/2	2 1/2	2 1/2
St. Pancras, E..... do.	2 1/2	2 1/2	2 1/2
St. Pancras, N..... C. Wall, Ltd., Upperne-road, Chelsea.....	5	5	At schedule prices
St. Pancras, S..... W. H. Lascelles & Co., 121, Bunhill-row.....	2 1/2	2 1/2	2 1/2
St. Pancras, W..... do.	2 1/2	2 1/2	2 1/2
Southwark, W..... T. Laphorne & Co., 1, High-street, Lambeth ..	At schedule prices	At schedule prices	At schedule prices
Walworth..... W. H. King, 39A, Invillie-road, Walworth.....	10	10	5
Wandsworth (group 1)..... C. Leather & Sons, 114, Merton-road, Wandsworth	At schedule prices	At schedule prices	At schedule prices
Wandsworth (group 2)..... do.	do.	5	do.
Westminster..... W. H. Lascelles & Co., 121, Bunhill-row.....	2 1/2	2 1/2	2 1/2
Whitechapel..... do.	2 1/2	2 1/2	2 1/2
Woolwich (group 1)..... Kirk & Randall, Warren-lane Works, Woolwich.....	5	10	7 1/2
Woolwich (group 2)..... do.	do.	do.	do.

St. Pancras, S., Manchester-street (Laundry and House-utility Centre).

Staines & Son..... £2,780 0	J. Grover & Son..... £2,638 0
C. L. Green..... 2,787 0	L. H. & R. Roberts..... 2,625 0
J. Peattie..... 2,754 11	J. Wilmore & Sons..... 2,600 0
W. Shurmer & Sons, Ltd..... 2,745 0	E. Lawrence & Sons..... 2,503 0
G. S. Williams & Son..... 2,727 0	G. Neal, Tennyson Works, Willesden-lane..... 2,465 0
General Builders, Ltd..... 2,678 0	H. Bouquet..... 2,638 0
J. Appleby & Sons..... 2,658 0	
Stevens Bros..... 2,656 0	
Marchant & Hirst..... 2,638 0	

Poplar, E., Brunswick-road Day Industrial School (Cleaning and Painting).

J. Dolman & Co. £338 0	Vigor & Co. £241 10
Parrott & Isom..... 330 0	A. H. Symes, Carpenter's-road, Stratford..... 225 0
A. W. Derby..... 315 0	
H. Bouquet..... 312 0	
A. J. Sheffield..... 284 0	

Chelsea, Park-walk (Laundry Centre).

For the adaptation of the deaf centre in connexion with the Park-walk school, Chelsea, for use as a laundry centre:—
E. Triggs..... £194

OUTSIDE THE COUNTY.
Gordon House Industrial School, Isleworth..... H. Tinkler, 72, Northcote-road, St. Margaret's, Twickenham.....
Mayford Industrial School..... C. C. Colborne, Star Hill, Woking.....

TENDERS.—Continued on page 643.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered
*New School, Bexhill-on-Sea.	Education Committee.	50l., 30l., and 20l.	July 27

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered
Scavenging	Rhondda U.D.C.	W. J. Jones, Surveyor, Council Offices, Pontre	June 9
Co-operative Convalescent Home, Blackpool.	Belfast Market Committee	J. B. Thorneley, Architect, 14, Birley-street, Blackpool.	June 10
Covered Market, Oxford-street	Edinburgh District Lunacy Board	City Surveyor's Office, Belfast	do.
200 tons of Irish Lime	do.	A. Paton, Town Clerk, Port Glasgow	June 12
Alters and Painting, Welsh Baptist Chapel, Ynysywl	do.	Edinburgh District Lunacy Board	do.
Extens. to Dormitories, etc., Dunfermline Workhouse	do.	A. Muirhead, Architect, 4, Abbey-park-place, Dunfermline	do.
Byres, Bangour Village Asylum	do.	H. J. Blanc, R.S.A., 25, Rutland-square, Edinburgh	June 18
Alterations to Farmstead Asylum	do.	D. D. Jones, Co-operative Store, Ynysywl	do.
Alterations, etc., Tabernacle Welsh Chapel, Ynysywl	do.	Borough Surveyor, Municipal Offices, Reigate	do.
4,500 tons of Granite	do.	do.	do.
Tar Paving, Redhill	do.	do.	do.
1,200 yds. super. of Retoping, Reigate and Redhill	Whitby and Monkseaton U.D.C.	J. Moore, Surveyor, Council-buildings, Whitby Bay, R.S.O.	do.
Private Street Improvement Works	Sheffield Decorations Committee	G. F. Wise, City Surveyor, Town Hall, Sheffield	do.
Decoration of Exterior of Town Hall	Kingston-on-Thames Corporation	H. A. Winsor, Town Clerk, Municipal Offices, Kingston	June 14
Stores	Horsforth U.D.C.	R. E. Jones, Engineer and Surveyor, Council Offices, Horsforth	do.
Fireplace in Com.-rooms at Mun. Technical School	Hallifax Education Committee	J. Lord, Borough Engineer, Town Hall, Halifax	do.
Roller Material for Construction of Wagons, etc.	East India Railway Co.	G. W. Young, Secretary, Nicholas-lane, London, E.C.	do.
Galvanised Corrugated Sheets	Manchester Corporation	F. E. Hughes, Electricity Department, Town Hall, Manchester	do.
Cables, Motors, etc., Electricity Department	Chipping Sodbury R.D.C.	Council Offices, Chipping Sodbury	do.
Sewage Disposal Works, Wlckwar	Cardiff Corporation	W. H. Lomas, Engineer, 11, Fold-street, Bolton	do.
Dwarf Wall and Railings (80 yds.), North-road	Farnworth U.D.C.	P. Vivian Jones, Architect and Surveyor, Hengod	do.
Larhill Sewerage	Fir Phil Building Club	J. H. Martindale, Architect, Viaduct-chambers, Carlisle	do.
Twenty Cottages at Fir Phil	do.	T. E. Knightley, Architect, 106, Cannon-street, E.C.	do.
Re-roofing Scalby Church, near Carlisle	Elmington Guardians	J. Drake & Son, Architects, Queensbury	June 15
Additional Store to Imbelby Ward	do.	Lynnam, Beckett, & Lyman, Architects, Stoke-on-Trent	do.
Six Through Houses at Ford Hill, Queensbury	Bradford Parish Council	10, Trafalgar-street, Newcastle-on-Tyne	do.
Extension of St. Barnabas Church, Stoke-on-Trent	Rhondda U.D.C.	Ellis Bros., Architects, 27, Orchard-street, Sheffield	do.
13 Houses & 8 Shops, Helmsley-rd., Newcastle-on-T.	St. Pancras Guardians	O. Thomas, Engineer, Gas Offices, Pontre, Glam.	do.
Erection of Cemetery, Chapel, etc., Oughtibridge	Chelmsford Corporation	Clerk to the Guardians, Town Hall, Pancras-rd., N.W.	do.
Underground Steel Liquor Tank, Ystrad Gasworks	Bristol Guardians	G. Kenslake, Architect, Station-rd., Bargoed	do.
Repairs, Clean, etc., Out-Relief Station, Clarendon-sq.	Shettleston School Board	J. J. Simpson, Clerk, St. Peter's Hospital, Bristol	June 16
Supplies	Trustees of Loxley Chapel	J. Watson, 24, Saint Vincent-place, Glasgow	do.
Stores	Wetherby Guardians	G. A. Wilde, Architect, 9, Bank-street, Sheffield	do.
Concrete Paving for Playgrounds	do.	Burton & Barry, Architects, Hull	do.
Enclosing Land at Burial Ground	Mr. Seadamore	Mr. John, Tyfri, St. George's, near Cardiff	do.
Infirmity at Wetherby Workhouse	St. George-in-the-East Guardians	W. Dowdeswell, Architect, Treahard	do.
Alters, etc., Congrega. Chapel, St. Bride's-super-Ely	do.	G. Kenslake, Architect, Station-rd., Bargoed	do.
Villa, Blackwood, Mon.	do.	Mrs. Langan, Carlton, Edgeworthstown, Ireland	do.
Alterations to "George Inn," Bridlir	At the Asylum	Clerk to Guardians, Guardians' Offices, Raine-st., Old Gravel-lane	June 17
Dwelling House at Carlton, Edgeworthstown	Coastguard Boathouse, St. Mawes, Cornwall	do.	do.
*Fitting up New Cupboards, etc., at Raine-st., Infirmity	Gloucester C.C. Education Com.	R. S. Phillips, Surveyor, Shire Hall, Gloucester	do.
Outside Paint, County Asy., Whittingham, Preston	Plymouth Corporation	School House, Barton, near Dartington	do.
Paints, Oils, etc., County Asy., Whittingham, Preston	do.	E. M. Williams, Health Department, 19, Whimpey-st., Plymouth	do.
Composite Road and Iron School, Mangotsfield	Bradford Education Committee	W. Clement Williams, Architect, 29, Southgate, Halifax	June 19
Alterations, etc., Barton National School and House	Ebbw Vale U.D.C.	T. C. Hope & Son, Architects, 23, Bank-street, Bradford	do.
Painting Building at Grange Lock, Hon. Mount Gold	South Stoneham Guardians	T. J. Thomas, Engineer and Surveyor, Ebbw Vale	do.
Entrance Lodge, etc., Workhouse, Gibbels, Halifax	Bury Gas Committee	W. H. Mitchell, Son, & Gutteridge, 9, Portland-street, Southampton	do.
Laboratory Fittings, Grange Road School	The Governors	A. Hornby, Clerk to Asylum Committee, Upton, Chester	do.
Widening Road	York Corporation	H. Simmonds, Engineer, Gasworks, Bury	do.
3 Iron Fire Escape Staircases, etc., Workhouse, W. End	Directors, G.W. Ry. Co.	W. Henscock & Son, Architects, Branch-road, Bailey	do.
Materials, Cheshire County Lunatic Asylum, Upton	Hallifax Education Committee	A. Orser, City Engineer, Guildhall, York	do.
Extension of Railway Siding (Gasworks Siding)	do.	G. K. Mills, Paddington Station, London	do.
Additions to Technical Schools, Batley	do.	J. Lord, Borough Engineer, Town Hall, Halifax	do.
Private Street Works	do.	do.	do.
Stores	do.	do.	do.
Colouring and Painting Elementary Schools	do.	do.	do.
Painting Technical Schools, Hopwood-lane	do.	do.	do.
Schools at Salford Lobbie	do.	do.	do.
Cast-Iron Pipes and Castings	do.	do.	do.
Stores	do.	do.	do.
*Supply of Uniform Clothing, Caps, etc.	do.	do.	do.
Stores	do.	do.	do.
Alterations at Union Workhouse, Selk, Oak	do.	do.	do.
4 Through Houses, etc., Wood Bottom, Hipperholme	do.	do.	do.
Making-up Streets	do.	do.	do.
Cleaning and Painting 17 Council Schools	do.	do.	do.
Cleaning and Painting 2 Voluntary Schools	do.	do.	do.
Private Street Works, Hornchurch	do.	do.	do.
Painting, etc., 4 Elementary Elementary Schools	do.	do.	do.
Sewage Works, Grampound-road	do.	do.	do.
Alterations to Grayingham Church, Lincs.	do.	do.	do.
*Alterations and Additions to Schools, Woking	do.	do.	do.
*Re-wiring Electric Bells at Infirmity	do.	do.	do.
Lightening Road near Broadwood Hall	do.	do.	do.
4 Concrete Pillar Beds, Tewkesbury	do.	do.	do.
Fire Engine House at Cheltenham	do.	do.	do.
Mission Hall with Vestries, The Heath, Cardiff	do.	do.	do.
Reconstruction, etc., of Settling Tank at Sewage Fm.	do.	do.	do.
5 Classrooms, South Tyneside School, Seab. Sch., Temple Parks	do.	do.	do.
Laundry & Wash's Day Indus. Sch., Temple Parks	do.	do.	do.
Pair of Bungalows, Leeds & Whitehall-rd., Lightcliffe	do.	do.	do.
Granite Chips	do.	do.	do.
*Sewerage and Sewage Disposal Works	do.	do.	do.
Main Sewerage and Sewage Disposal of Askers	do.	do.	do.
*Erection of Ornamental Masonry Structure	do.	do.	do.
Electrical Equipment of Tramways	do.	do.	do.
Colour Washing and Painting Elementary Schools	do.	do.	do.
Alters, etc., to Zion English Baptist Ch., Ynysywl	do.	do.	do.
*Alterations, St. John's Girls' School, Sheffield	do.	do.	do.
Pumping Stations, Sewers, etc., Sheffield	do.	do.	do.

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered
Beckenham U.D.C.	Beckenham U.D.C.	Council's Surveyor, Beckenham.	
Paddington Guardians.	Paddington Guardians.	E. H. Sim, Architect, 8, Craig's-court, Charing Cross, W.C.	June 25
Leek U.D.C.	Leek U.D.C.	W. A. Owen, Architect, Main-street, Cadoxton, Barry	do.
Lewisham Borough Council	Lewisham Borough Council	Surveyor's Department, Town Hall, Leek	June 26
Ilford U.D.C.	Ilford U.D.C.	H. Shaw, Engineer, Town Hall, Ilford	do.
Herts C.C.	Herts C.C.	County Surveyor, Hatfield	do.
St. Marylebone Guardians	St. Marylebone Guardians	Superintendent at Schools	do.
Guardians	Guardians	Price & Belham, 52, Queen Victoria-street, London, E.C.	do.
Southampton Corporation	Southampton Corporation	J. A. Crowther, Borough Engineer, Southampton, E.C.	June 27
Caerphilly U.D.C.	Caerphilly U.D.C.	H. M. Phillips, Architect, Olive-chambers, Windsor-place, Cardiff	do.
Commissioners of H.M. Works, etc.	Commissioners of H.M. Works, etc.	H.M. Office of Works, Storey's-gate, S.W.	do.
Leyton Education Committee	Leyton Education Committee	W. Jacques, Architect, 2, Fen-court, E.C.	do.
Hove Education Committee	Hove Education Committee	do.	do.
Lambeth Borough Council	Lambeth Borough Council	Clayton & Black, 10, Prince Albert-street, Brighton	June 23
Rothbury Guardians	Rothbury Guardians	Borough Engineer, 346, Kensington-road, S.E.	June 23
West Riding C.C. Education Dept.	West Riding C.C. Education Dept.	A. Snarth, Bolam House, Rothbury	June 23
Water Supply to Workhouse	Water Supply to Workhouse	W. Haydn, Divisional Offices, Ecclesfield, Sheffield	June 30
Painting and Lettering Bly. Coal Wagons at Colliery	Painting and Lettering Bly. Coal Wagons at Colliery	Lincoln Wagon and Engine Co., Ltd., Lincoln	July 3
Drilling a Drift, 200 yds., Dick Ing & Latham Farms	Drilling a Drift, 200 yds., Dick Ing & Latham Farms	W. B. Woodhead & Son, Surveyors, Exchange, Bradford	No date.
1,000 yds. of Asphalting, Selby Isolation Hospital.	1,000 yds. of Asphalting, Selby Isolation Hospital.	T. S. Ullathorne, Contractor, Selby	do.
Painting, Elix & Hilton's Piano Factory, Leeds	Painting, Elix & Hilton's Piano Factory, Leeds	St. Brigate, Leeds	do.
Decorations, etc., High Kasket Church School.	Decorations, etc., High Kasket Church School.	Oliver & Doghshun, Architects, Carlisle	do.
Painting of Paint and Fitting Old Oak Panelling	Painting of Paint and Fitting Old Oak Panelling	M. Ogilvy Spence, Glynneath, Glam.	do.
Painting Outside of Wycliffe Hall, near Winston	Painting Outside of Wycliffe Hall, near Winston	T. B. Jackson, Riston Grange, Hull	do.
Repairs at Llanwryd Wells.	Repairs at Llanwryd Wells.	Swash & Bain, Architects, Midland Bank-chambers, Newport	do.
March Library, Upper Holloway	March Library, Upper Holloway	Town Clerk, Town Hall, Upper-street, N.	do.
Repairs to Nurses' Home and Painting Work	Repairs to Nurses' Home and Painting Work	W. H. Hope, Architect, Seymour-road, Hampton Wick	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
Twickenham U.D.C. Educa. Com.	Twickenham U.D.C. Educa. Com.	3l. 3s. per week	June 13
Northern Polytechnic Institute.	Northern Polytechnic Institute.	125l. per annum	June 14
do.	do.	150l. per annum	do.
Admiralty	Admiralty	No stated	June 24
Middlesex Education Committee	Middlesex Education Committee	12s. 6d. per evening	June 29
do.	do.	15s. per evening	do.

Those marked with an (*) are advertised in this number. Competitions, iv. Contracts, iv. vi. viii. x. Public Appointments, xvi.

TENDERS.—Continued from page 641.

KEYNORTH.—For erecting an infectious diseases hospital for twenty beds, for the Dunstable and District Medical Joint Committee. Mr. G. Simcox, C.E., architect, Town Hall, Dunstable. Quantities by Messrs. Anscombe & Franklin, Luton.—
Anscombe & Son .. £4,865 A. Robinson .. £4,176
Turrell .. 4,775 H. Higgs .. 4,100
Sainsbury & Sons .. 4,580 C. Wright .. 3,888
G. Dunham .. 4,640 S. W. Nash, Dunstable .. 3,685
Anscombe & Son .. 4,293 stable* .. 3,685
G. Dunham .. 4,180

KEYNSHAM.—For additions to infirmary at Keyns Union Workhouse, for the Guardians. Mr. H. M. Hunt, architect and surveyor, Liverpool-chambers, (Cross-street, Bristol).—
Hunt & Jeffries, Oldland Common, Bristol* .. £1,298
Note tenders sent in. Highest, £2,268; lowest, £1,200.]

LONDON.—For painting, etc., at the Workhouse, at the Board of Guardians. Mr. H. M. Hunt, architect and surveyor, 51, Tooley-street, London Bridge, S.E.—
Richards, 9, Shannon-grove, Brixton, S.W. .. £724

LONDON.—For alteration to saloon bar of "The Ivy Bell." Bow, E. Mr. H. Riches, architect, 3, Red-lane, King William-street, London, E.C.—
Osborn & Son .. £217 J. T. Roberts* .. £200
* Accepted with small modifications.

LONDON.—For repairs and decorations to "The Hulse Arms," Ilford, London, E. Mr. H. Riches, architect, 3, Crooked-lane, King William-street, London, E.C.—
A. W. Derby £178 0 F. & A. Willmott £145 0
Sheffield Bros. .. 180 0 Clemens Bros.* .. 145 10

LONDON.—For work at the Sebright Music Hall, Bethnal Green, N.E. Mr. H. Riches, architect, 3, Crooked-lane, King William-street, London, E.C.—
Builders: Kirk & Kirk .. £290 0 0
Fire Marine, etc.: Merryweather & Sons, Ltd. 59 18 0

LONDON.—For main pump renewals, Western pumping station, for the London County Council.—
Fullerton, Rodgart, & Barclay, Ltd. £5,290 0
Galloways, Ltd. £217 0
Clayton, Goodfellow, & Co., Ltd. .. 3,995 0
Richardsons, Westgarth, & Co., Ltd. .. 8,997 10
J. Musgrave & Sons, Ltd. 3,503 0
J. Simpson & Co., Ltd. 5,500 0
Glenfield & Kennedy, Ltd. 3,443 0
J. Cochrane .. 3,550 0
The Thames Ironworks Shipbuilding and Engineering Co., Ltd. 3,320 0
Fleming & Ferguson, Ltd. 3,393 0
Hathorn, Davy, & Co., Ltd., Leeds* .. 2,534 0

LONDON.—For painting and cleansing works at the City Hall, Charing Cross-road, for the Westminster City Council.—
Kirk & Kirk £729 0 J. Roberts .. £650 0
J. R. Sims .. 712 0 H. & E. Lea .. 625 0
T. Haylock .. 695 0 J. Styles & Son .. 587 0
T. Coulthard .. 673 10 Love & Co.* .. 535 5

LONDON.—For new penstock gearing and tide flaps, Northumberland-street and Regent-street sewers, for the London County Council.—
J. Stewart & Sons, Ltd. £900
Yates & Thom .. 497
A. Goodwin & Son, Ltd. 495
J. Cochrane .. 430
Glenfield & Kennedy, Ltd. 395
Flavell & Churchill .. 376
Huxter & English .. 349
J. Blackborough & Sons, Brighouse* .. 313

LONDON.—For electric light installation, Wapping Fire Station.—
O. Clark & Co. £150 0
National Electric Construction Co., Ltd. .. 145 0
E. J. Coleby & Co. 137 10
W. H. Johnson .. 138 0
E. Dawson, Ltd. 132 12
Durrell & Co. 130 10
Barlow & Young .. 130 0
A. H. Marshall .. 125 0
Tamplin & Makovick, 27, Charles-street, Haymarket, E.W.* .. 115 0

LONDON.—For the construction and re-construction of further tramways (roadwork, paving works, etc.), for the London County Council.—

	Tramways work (exclusive of Woolwich-road lines).	Paving works for street widening.	
	£ s. d.	£ s. d.	£ s. d.
Hav & Co. 1	112,568 10 0	6,014 17 4	118,613 7 6
Osborn & Co., Ltd. 2	109,876 18 8	4,858 1 1	114,531 19 9
Nuttall & Co. 3	105,617 15 7	5,345 11 3	110,963 6 10
Osborn & Co., Ltd. 4	104,334 3 7	4,925 18 7	109,260 2 2
G. Blackwell & Co., Ltd. 5	103,232 7 2	5,277 12 9	108,569 19 11
G. White & Co., Ltd. 6	101,764 0 3	5,582 18 1	107,346 18 4
Osborn & Son 7	101,507 5 7	4,652 2 10	106,039 8 5
Hav, Kerr, & Co., Ltd., London* 8	98,870 5 1	4,568 10 0	103,428 15 7

* Incomplete tender.

Messrs. Dick, Kerr, & Co., Ltd., will be allowed to sub-let to the undermentioned firms (or to such other firms or firms as may be approved by the engineer under the contract) the following portions of the work in connection with the Tramways from Trafalgar-road, Greenwich, to Blackwall-tunnel, and from New Cross-road to New Cross, London, namely:—(1) to the Hadfield Steel Foundry Co., Ltd., the manufacture of the special work consisting of poles, crossings, etc.; (2) to the Anderson Foundry Co., Ltd., of Middlesbrough, the manufacture of cast-iron yokes; (3) to Messrs. Doulton, Ltd., of London, the manufacture of the porcelain insulators; and (4) to Messrs. Bayliss, Jones, & Bayliss, Ltd., of Wolverhampton, the manufacture of the tie-bars, etc.]

LOSSIEMOUTH.—For erecting business premises, Mr. E. B. Pratt, architect, Town and County Bank-buildings, Elgin.—
Mason: J. McPherson, Elgin .. month
Carpenters: W. Ritchie & Son, Lossiemouth .. month
Plumbers: W. Lyon & Son, Elgin .. £950
Slater: J. Wilson, Lossiemouth ..
Plasterer: C. Menzies, Lossiemouth ..
Painter: W. McGillivray, Lossiemouth ..

MERTHYR.—For rebuilding Nos. 21, 22, and 23, Castle-street. Mr. C. M. Davies, architect, 112, High-street, Merthyr.—
J. Williams .. £698 Hall Bros. £533
J. Jenkins .. 677 E. L. Sullivan ..
S. Hawkins .. 660 Merthyr* .. 513
Jenkins Bros. 595

MERTHYR.—For additions to Brynglas, for Dr. Webster, Merthyr. Mr. C. M. Davies, architect, 112, High-street, Merthyr.—
B. Lloyd .. £1,053 17 6 M. Warlow .. £776 0 0
J. Jenkins ..
Canal Wharf, Merthyr* .. 779 17 0

MIDSOMER NORTON (Somerset).—For the erection of a villa residence at Norton Hill, Midsomer Norton, for Mr. E. J. Kluze. Mr. W. F. Bird, architect, Midsomer Norton. Quantities by the architect:—
J. Long & Sons £1,985 0 0 J. Bird £1,400 0 0
A. Wills & Sons 1,725 0 0 W. Tovey, Mid-
W. Webb 1,717 0 0 somer, Midsomer Norton
F. J. Amery 1,870 0 0 tot 1,865 8 0
T. Foster 1,647 9 8
Accepted subject to amendment.

MIDSOMER NORTON (Somerset).—For certain alterations to the Wills and Dorset Bank, Midsomer Norton, for the Wills and Dorset Banking Co. Mr. W. F. Bird, architect, Midsomer Norton:—
J. H. Tovey £307 15 J. Bird, Radstock* £380 0
Accepted subject to amendment.

MIDSOMER NORTON (Somerset).—For the erection of two small villas in North-road, Midsomer Norton, for Mr. Mark Matthews. Mr. W. F. Bird, architect, Midsomer Norton:—
W. & A. Edgell £988 0 W. Tovey, Mid-
J. H. Tovey 785 0 somer Norton £747 10
Accepted subject to amendment.

NEW SARUM.—For road works, etc., Fair View-terrace and Chapel-place for the Town Council:—
Fair View-terrace £320
Wort & Way, Salisbury 50
Wort & Way, Salisbury 50

OLD BURTON.—For erecting a block of schools at Road End, for the Education Committee. Mr. A. Long, architect, New-street, West Bromwich. Quantities by architect:—
M. Round, Dudley, Staffs* £3,750

PONTEFRAC.—For internal alterations and lavatories, for the Carleton Arms Inn, Pontefract, Messrs. Garfield & Pennington, architects, Pontefract and Castleford:—
Golder Bros. & Woodcock, Northgate, Pontefract* £140 19 6

PONTEFRAC (Mon.).—For pulling down and re-building the King's Head Hotel, for Messrs. Phillips & Sons, Ltd., Messrs. Swallow & Haver, architects and surveyors, Steam Packet-chambers, Dock-street, Newport, Mon.:—
D. Hinton £3,785 0 0
Whiting £4,155 0 0
D. W. Pugh £4,001 6 6
J. Linton 3,900 0 0
Co. 3,900 0 0
W. Jones 3,817 0 0
Son 3,804 0 0
D. W. Richards 3,798 0 0
C. Lock £3,785 0 0
E. Powles 3,777 0 0
G. Morris & Co. 3,722 0 0
C. H. Reed 3,500 0 0
E. C. Jordan 3,487 0 0
Dean & Co. 3,407 2 0
A. S. Morgan & Co., New-
port* 3,374 5 11

RAMSBOTTOM.—For storm-water filters and storm overflow at sewage works, Summerseat, for the Urban District Council. Messrs. J. Diggle & Son, engineers, Hind Hill-street, Heywood, and Westminster, S.W.:—
E. Taylor, Blackpool £435 13 9

SALISBURY.—For sewers and sewage disposal works (Contract No. 2), for the Corporation. Sir A. Binnie & Sons, engineers, 9, Great George-street, Westminster, S.W.:—
Wort & Way, Salisbury* £24,938 12

SALISBURY.—For sewers and sewage disposal works (Contract No. 1), for the Corporation. Sir A. Binnie & Sons, engineers, 9, Great George-street, Westminster, S.W.:—
Wort & Way, Salisbury* £24,163 10 10

SALISBURY.—For extension of public swimming baths, for the Urban District Council:—
Wort & Way, Salisbury* £235

SKETTY.—For erecting ten pairs of villas at Sketty, Swansea, for the Trustees of the Concession Building Club. Mr. B. C. Deacon, architect, 20, Fisher-street, Swansea. Quantities by Mr. W. P. Horsburgh, Central-buildings, Liverpool:—
Fuge & J. & F.
Roser £15,926 0 0 Weaver £13,449 0 0
Brown & T. D. Jones 13,316 0 0
Backhouse 15,790 0 0 Hughes 13,215 0 0
T. Richards 15,465 10 11 Stirling 12,600 0 0
A. White & S. Fowler 12,500 0 0
Sons 15,127 0 0 W. Griffiths 12,399 0 0
D. Jenkins 13,995 0 0 & Sons 12,399 0 0
Lloyd Bros. 13,887 5 7 J. P. Eve Co. More-
H. Billings 13,800 0 0 cambe*
J. Marles & Sons 13,500 0 0

Accepted subject to certain deductions being made.

SHEFFIELD.—For the erection of a house, Worring-road, Sheffield, Essex, for Mr. W. E. Spella. Mr. H. R. Bird, architect and surveyor, Brantwood:—
R. Claydon £894 10 E. Dix £685 0
F. W. Jarvis 693 0 F. W. Burtwell* 676 0

SOUTHAMPTON.—For private street works in Howard-road, for the Corporation:—
H. Lawrence £1,825 0 F. Osman £1,443 10
H. J. Hood 1,539 0 J. Butt* 1,443 0
Douglas & Richard 1,501 12
[All of Southampton.]

STAFFORD.—For the Sir Thomas Salt memorial additions to Stafford Grammar School, for the Governors. Mr. H. T. Sandy, architect, 22, Green-gate, Stafford:—
G. Dyke £1,718 9 0 T. Moss £1,547 0 0
G. H. Marshall 1,631 0 0 C. J. Nevitt 1,539 0 8
F. Espley & Jervis Bros. 1,490 0 0
Sons 1,504 0 0 A. Adams &
G. Hodges 1,598 0 0 Pemberton,
T. Love & Sons 1,589 0 0 Stafford* 1,489 0 0

TON.—For erecting a schoolroom on St. David's Church ground, for the Rev. Canon Lewis. Mr. Jacob Rees, architect, Pentre:—
W. Parry £1,460 0 0
A. Richards & Sons 1,403 0 0
E. Jones 1,366 3 2
W. E. Wallis, Ystrad Rhondda* 1,300 0 0

WEST BECKHAM.—For alterations and additions to Infirmary at West Beckham Workhouse. Mr. T. J. Goldie, architect and surveyor, Bank Place, Norwich:—
Alterations and Additions:—
Verandah and Staircase:—
Side Staircase:—

Alterations and Additions:	Verandah and Staircase:	Side Staircase:
W. J. Hannant £778 0 0		
J. W. Weston 783 0 0	£20 13 0	£41 0 0
E. Chapman 735 0 0	66 0 0	40 0 0
B. G. Payne 721 17 7	90 12 0	42 9 0
C. T. Baker Ltd. 712 12 4	53 19 2	40 5 6
J. W. Neate 708 3 6	57 4 0	42 2 6
J. Gaze 688 18 0	62 0 6	76 17 6
R. C. Waite 697 2 7	59 3 0	39 9 6
J. Needs 688 0 0	68 0 0	41 0 0
Appleton Bros. 676 11 1	57 0 0	39 19 6
H. Bullen 648 0 0	71 15 0	38 19 0

WOODFORD.—For the erection of a detached house at Woodford, Essex. Mr. H. Riches, architect, 3, Crooked-lane, King William-street, London, E.C.:—
T. Osborn & Sons* £1,268

W. H. Lascelles & Co.

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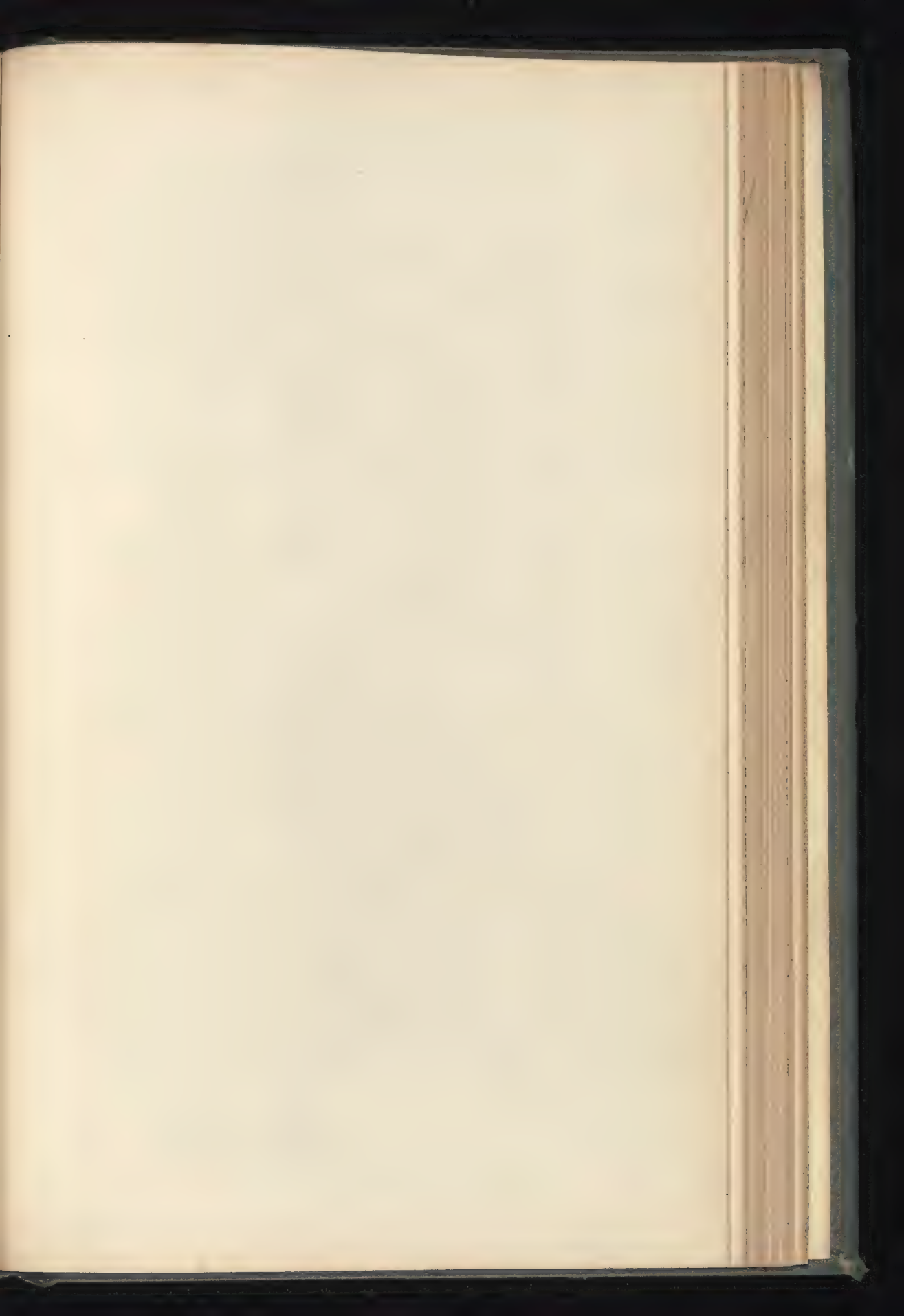
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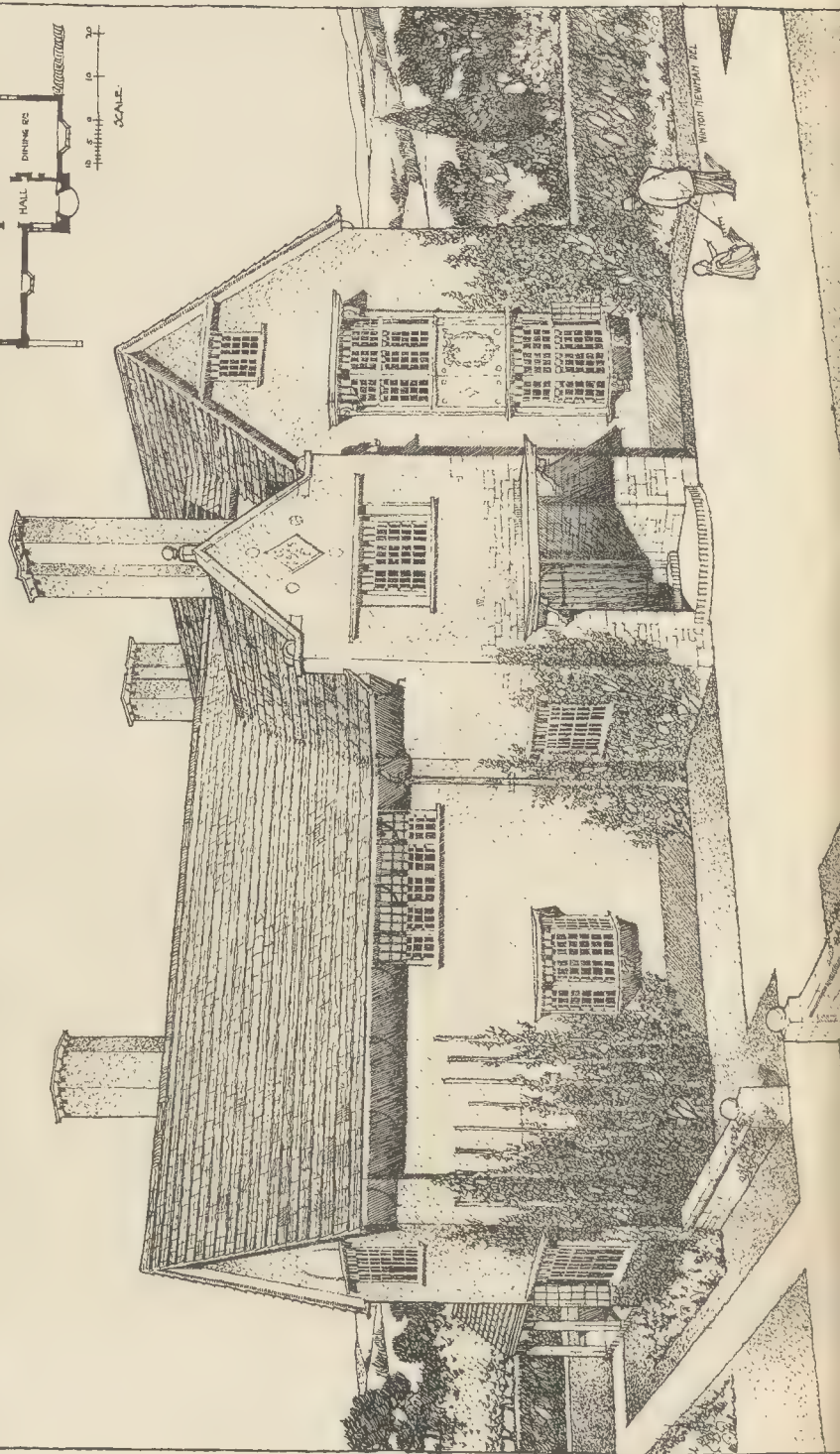
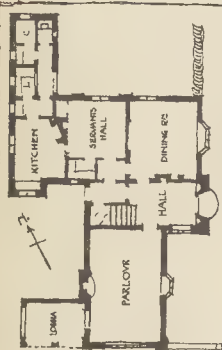






THE BUILDER, JUNE 10, 1905

HOUSE AT DENBIGH.
 BY G. FRANCIS ESQ.
 E. GUY DAWBER ARCHT.



Church of S. Chad: Longsdon.

Genl. C. Horsley
Architect

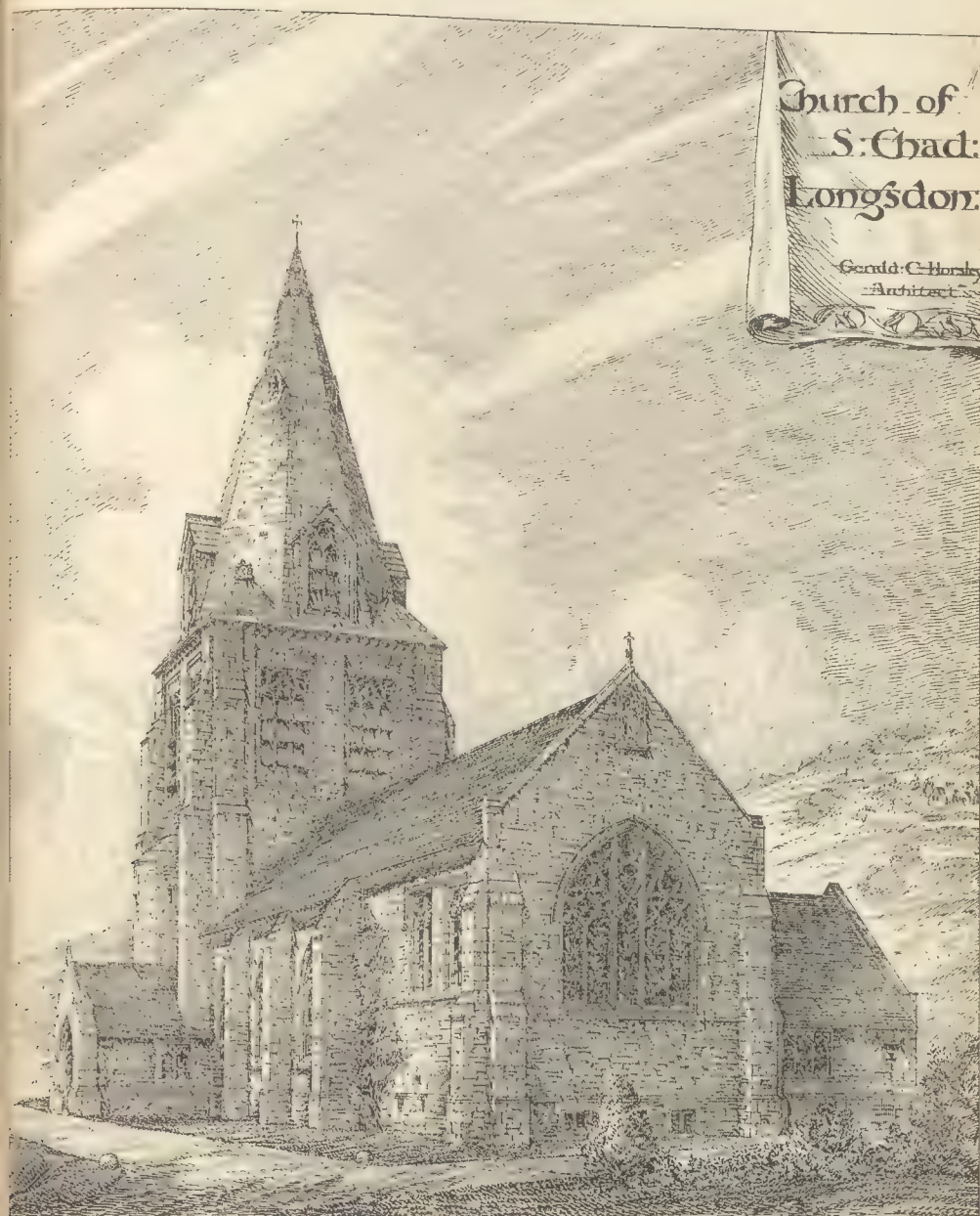


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VIEW FROM NORTH-WEST



VIEW FROM NORTH-EAST.



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The Builder.

VOL. LXXXVIII.—No. 3254.

JUNE 17, 1905.

ILLUSTRATIONS.

Memorial to the Late Marchioness of Lothian.....	Mr. A. G. Walker, Sculptor.
University College Hospital Medical School.....	Mr. Paul Waterhouse, F.R.I.B.A., Architect.
Houses at Chislehurst and Cambridge.....	Mr. W. Curtis Green and Mr. A. C. Dickie, Architects.
Casket Presented to H.M. the King of Spain.....	Designed by Miss Florence Steele.
Marble and Bronze Fountain.....	Mr. F. Lynn Jenkins, Sculptor.

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Early Mural Painting.



FTER an interval of some years the second volume of Mr. Westlake's history of mural painting* has made its appearance. In it the author deals with

what is perhaps the most difficult period of all, both from the meagreness of extant contemporary work and the scantiness of its literature—namely, from the IInd to the XIIth centuries A.D. An endeavour to give a readable account of what data are forthcoming, with the conclusions which may be drawn from them, both as regards the archaeological and technical significance of the pictures and the nature of their origin, is of necessity a task demanding as much delicate discrimination as honest research. As in biology and the kindred natural sciences, so in a history of any branch of art, an exact study of the subject can follow only on a display of those facts which more especially admit of such conclusions. There have always been certain schools of painting; it falls to the lot of the historian to reveal the similarities and the differences of these schools, and to estimate the comparative values of the various influences at work upon them and the consequent progression, or decline, that may have accrued. At no point, indeed, in his book does Mr.

Westlake forget to work upon such a basis. It would, moreover, be unjust, in view of the difficulties and magnitude of his task, and with the comparatively small space at his disposal, to say that he has produced a volume of but mediocre importance; yet, in our opinion, there are times when he is not altogether happy in laying the most desirable stress upon those points which more particularly seem to demand it.

In an introductory preamble the author is concerned with some of the effects Christianity in its earlier forms had upon art; of the gradual blending together of pagan and Christian symbolisms; later, of the growth of such religious orders as those of S. Basil and S. Benedict, and the encouragement of all the arts by the sovereign pontiffs chosen from the latter body. "The religious knew their work," says Mr. Westlake; "not only was it necessary to give some culture to the peoples amongst whom they lived, but the vital truths of Christianity had to be taught, and art was the chosen language to teach them in." It is to the form in which the "vital truths of Christianity" were launched out into the world by zealous and jealous churchmen that the slough, into which art of the period falls, owes its existence. So far from the prevailing art never reaching "real technical excellence," it is not even allowed to proceed along a natural path, but is kept under, as it were, by the new bigotry that comes into being while Christianity is spreading over Europe. It is no longer so much an expression of beauty, but rather a

teacher of truth. As the authorsays, "he [the artist] had to work from a recipe"—a condition of affairs which was more or less prevalent until the art revival of the XIVth century. There is consequently little freedom, few startling innovations even from the technical point of view, in most of the paintings adorning the walls or roofs of buildings during this period. The pictures were largely there for a lesson, and a Christian lesson, which took a beauty purely physical into infinitesimal account. The teachers may be said to have gone even further, inasmuch as over the space of several centuries they very generally endeavoured to prove that as most real works of art were remnants of idolatry, they ought to be destroyed. The result upon art can well be imagined. No one was allowed to give his own fancy much play, nor even to depict—we are speaking of mural paintings—scenes which more especially appealed to him; "the art became essentially descriptive . . . but educationally there was no need of pictorial effect." The retarding influence of mediæval Christianity is dismissed rather summarily by Mr. Westlake, yet, in our opinion, it is of equal importance with the influences of all those ancient schools of painting which have apparently helped to alter the course of the art of a later age.

The first chapter is given over to a somewhat disappointing discussion on the various early representations of the head of Christ. The majority of these are to be found in Roman cemeteries, and appear to have been drawn from the one

* *An Elementary History of Design in Mural Painting*, Vol. II. By N. H. J. Westlake, F.R.S.A. London: James Parker & Co. 1905.

or two representations brought westward, and regarded as authentic. Some are bearded, others beardless. For the existence of the latter Mr. Westlake would suggest the explanation that the artists, being Roman, "had never seen any picture which purported to be a true resemblance" of the original, and so, presumably, worked from a Roman model. Yet it seems reasonable to estimate the changes in the expression of the face as of equal if not greater historical importance. The earliest heads show nothing of the suffering and pain to be seen in the later ones. It was difficult for the painters to forget the masterpieces of the Greek artists or the handbooks of such teachers as Apelles and Pamphilus, yet many were obliged to paint Christ more as an allegory than to attempt actual portraiture. And later, when the narrowing influence of the Church was beginning to have its effect, we see the Christ no longer painted youthful and handsome, but suffering and on the Cross. It was not so much the actual portrait that was wanted as a pictorial lesson of the meaning of Christ's life, and by consequence we see the person of Christ become gradually degraded in art. Mr. Westlake is at pains to remark on the Eastern influence appearing in such representations, and on the "altered type of features given to them in the later paintings in the Roman cemeteries and churches," but he does not appear to have made the most of an opportunity of enlarging upon a point which seems to us of the greatest importance.

Turning, however, to the second chapter, on early Christian Roman art, we see Mr. Westlake at his best. The several influences at work are here treated of in a manner as concise as it is reasoned. Byzantine teaching appears in the "general severity of the drapery and figure and the excessive jewellery," while we now see the development of a "symbolism of subjects" which did much to enlarge the scope of the painter. The question of the Nimbus here calls for especial attention, and in an appendix the author is led to the conclusion that such a symbol was an "attribute of power generally," not, as in the case of later times, of holiness alone. The development of the circular-arched architecture, and the consequent decoration of the epistyle, with the introduction of mosaic towards the end of the IVth century, is next treated of. Although it is, sometimes, held, that mosaic helped in a way to preserve art in Italy, its influence on mural painting was undoubtedly bad; technique suffered, while treatative work gave place to mere slavish industry. In one of his helpful and copious notes, the author says:—"It is curious that at this very period not only did painting in Europe become worse, but the walls became less skilfully prepared for the painting:—the whole process of the art seems to have suffered." The sack of Rome, moreover, in 410 A.D. was the means of further retarding the art, yet there came revivals, of small importance, however, until "in the IXth century, in Greece, a new era commenced which was reflected in Italy later on." From that time on to the age of Pisani and Cimabue, in spite of the various Abbots of Cluny—

always a strengthening influence to art—Mr. Westlake sees no real advance outside of Greece after the XIth century, which was the time when Italy in general and Rome in particular benefited from the Hellenic revival. In the ensuing account of the more important paintings, those in the Church of S. Maria Antiqua in the forum are, as might be expected, described at some length. A painting of the Crucifixion in the sanctuary Mr. Westlake would characterise as Alexandrine, while in the Chapel of SS. Quiricus and Julietta, which faces the altar, there is a central figure of Christ exhibiting Syro-Hellenic traits. The inference that Pope John VII. (705-707), to whom the church owes the greater part of its decoration, made use of an imported artist is an obvious one. A number of excellent plates make the description of this basilica one of the most interesting in the book. Yet in this church, as well as in others, such as S. Clement's, only lately discovered underneath a basilica of later date but the same name, the paintings fitly reflect the mediocrity of Roman art of the period. Whatever the causes may have been, the history of the art of these middle ages, scanty though it must be, is one of poverty both in conception and technique.

The following two chapters treat of mural painting in Italy as a whole and in European and Asiatic Greece. Mr. Westlake insists, with reason, that the art of painting, "as well as the vestments and the ritual of many religious rites and secular functions in certain localities of Italy, even to the XIVth century, was exceedingly Greek," suggesting that Greeks joined the order of S. Benedict, which was largely instrumental in spreading their native art. Yet although many Greek artists migrated to Italy during the VIth and VIIth centuries, they do not seem to have raised the art to any great degree. As the author suggests, "they do not seem to have been of the best." It is only in the XIth century that we observe work in a lesser state of decadence, notably in the basilica of S. Angelo in Formis, near Capua. Much of the work of this time followed largely on the exertions of Pope Gregory VII., and, yet more important, of the Abbot Desiderius, afterwards Pope Victor III. In this work at Capua there is abundance of both Greek and Byzantine features, and it seems more reasonable to suppose, as does the author, that "the artists had probably been engaged at Constantinople," and that "they may have belonged to the Athenian schools but had become corrupted by Byzantine practices," than to argue, like Woermann, that the paintings were "the work of artists trained under Byzantine masters." In any case, no paintings of the period exhibit solely Italian characteristics. In his account of the XIth century revival, when these artists were brought to Italy, Mr. Westlake makes no mention of Pisa, where, even though there is to be seen little or no mural work of the period, it is probable that a great local revival did take place, giving rise to Buschetto's school of sculpture, which ultimately produced Niccolo Pisani. It is true that Buschetto's school was one of sculpture, yet it was formed at a time of widespread enthusiasm for decorative art,

following, we are told, on the adornment by Greek artists of Monte Cassino at Subiaco in 1066, and it is not to be supposed that mural painting did not share in the general amelioration. The author, in fact, tells us so much, yet he has nothing to say of the art-rivalry which arose at this time in many Italian towns. In the chapter on Greece a number of plates of the paintings in the monastery of Daphne and several examples of other Grecian art exhibit a simplicity of design together with a freedom in composition that is not seen to such an extent elsewhere. The Athenian school, indeed, is in fairly direct opposition to the Byzantine school proper, which is "severe in its pose and draperies," later, however, to "become affected by the Eastern taste for decoration and jewellery on its dresses." Coptic art, which, together with a note on Bulgarian and Russian art, is included in this chapter, shows many Roman resemblances, but a wholesale destruction of Copt work by the Moslems has not left us much actual painting from which to form conclusions as to the art-history of the race.

Mr. Westlake devotes two chapters to a consideration of early mural painting in France and Germany. "The paintings of the XIth century in France," he says, "are the earliest of importance that have survived to our time from the wars and destruction that have crossed that country." In a description of the paintings in the Abbey of S. Savin, Vienne, founded at this time, he is of opinion that more than one artist was employed upon them. "At this period the character of the churches lent themselves entirely to painting"; in consequence there was more demand for artists, and those whose abilities were not of such a kind as would admit them to work necessitating a master's brush were obliged to travel about doing work of a subordinate kind. In this way arose an "international occupation of artists"—a scheme of things producing very varied effects.

In England there are still fragments of Roman painting. We are advised in a consideration of early English art to "lay aside the insular idea." While, on the one hand, S. Boniface converted Germany and preached in Russia, Alcuin became secretary to Charlemagne, and the Celt S. Gall founded monasteries in Switzerland, English sees and monasteries, on the other hand, "received ecclesiastics and monks from nearly every part." In this chapter again are a number of excellent plates and descriptions. Mr. Westlake has made some fine drawings of the various paintings which are still to be seen. He writes with conviction upon the numerous doubtful points which arise from a comparative account of the art.

Lack of space will not allow us to do more than merely mention the final chapter, which deals with the question of ornament; yet, whether the author is speaking of the rosetto, the svastica, or the scroll, he is equally happy in his descriptions, made easier as they are by a series of explanatory plates. On the whole, then, Mr. Westlake's work is one of great merit, and if at times we are inclined to grumble at possible omissions,

we are largely compensated by the perusal of a book, not altogether free, be it said, from unfortunate phrasings and misprints, but one eminently the result of wholesale study and careful workmanship. We look forward to the appearance of the succeeding volumes.

NOTES.

Vendors and Purchasers and Street Liabilities. The case of East Ham Urban Council *v.* Aylett has decided a question under the Public Health Act, 1875, which was left open in the case of Millard *v.* Balby by Hexthorpe Urban District Council, which was commented upon by us in our issue of November 5, 1904. Section 150 of the Public Health Act, 1875, gives the urban authority in any urban district powers to call upon the owners or occupiers of premises fronting on any street, which is not a highway repairable by the inhabitants at large, and which requires to be sewered, paved, metalled, lighted, etc., to do the work, and in default to do the work themselves and to recover the expenses in proportion to the frontages from the owners. Section 257 enacts that such expenses may be recovered "from any person who is the owner of such premises when the works are completed." In Millard's case, Millard was the owner when the notices were served under section 150, and also when the works were completed, but he had sold the premises before the final apportionment was made under section 257. The Court of Appeal found that he was liable as being the owner of the premises when the work was completed, reversing the Divisional Court, which had held he must be owner when the final demand was made as well. In the present case Aylett became the owner after the first notice was served but before the completion of the work, and had sold the premises after the completion but before the final apportionment. He contended that the fact of his not being the owner at the time of the first notice distinguished his case from Millard's, and the justices had found in his favour, but the Divisional Court have now decided that he was liable since he was the owner at the time when the works were completed. It behoves vendors and purchasers to be very careful to ascertain their liabilities when they purchase, and to secure themselves by inserting words in the contract. See our note July 2, 1904, on the case *re* Allen and Driscoll's contract, where this same question was decided, but as between vendor and purchaser.

Drains *v.* Sewers. Two cases on drains and sewers are reported in the Law Reports for the current month. In Jackson *v.* Wimbledon Urban District Council, facing a certain street were sixteen houses, twelve of which were owned by one owner and the other four were owned as to three of them by another owner, but the fourth house was owned separately. The system of drainage was as follows: A public sewer ran down the street, but at right angles to the sewer and passing between the twelve houses and the other four houses was a drain connected with a manhole at a point in a line with the back of the houses,

and this was admitted to be a "single private drain." A line of pipes running behind the twelve houses received the drainage, and was connected with the private drain at the manhole, the other four houses were similarly drained and connected at the manhole. The system of drainage required repair, and the District Council having done the work were suing the owner of the twelve houses in respect of the work done on the drain behind his houses under section 19 of the Public Health Act, 1890, and section 41 of the Public Health Act, 1875. The Council contended that since the drainage of both sets of houses reached the sewer through the single private drain this brought the case within section 19 of the former Act, "where two or more houses belonging to different owners are connected with a public sewer by a single private drain. . . ." The owner contended that since his houses were all in one ownership the drainage behind them constituted a sewer. The Court of Appeal, affirming the Divisional Court, held that the part of the drainage requiring repair must in itself be a single private drain for the section to apply, and that in this case, all the twelve houses being in one ownership, this was a sewer. This case well illustrates the anomalies of the law, since it shows that the rights and liabilities of the authorities depend on no principle, but would vary by a change of ownership of one house in either group. In the second case, Wincanton Rural District Council *v.* Parsons, the Council had taken proceedings under sections 94 and 95 of the Public Health Act to abate a nuisance. The respondent was the occupier of a house, and the sewage was discharged into a drain running alongside the country road, and which had been made some years before by a former owner or tenant; this drain ran into a catchpit, which had been constructed by an adjoining owner to carry off the surface water from the highway. Some 70 ft. further down a drain from another house joined it, and it finally discharged into a stream. There was some breakage in the pipe close below the catchpit, and the respondent's contention was that this drain was a sewer and that the Council were liable to repair it, but the Divisional Court held that this formed no defence to these proceedings to abate the nuisance. The cause of the nuisance was the discharge of the defendants' sewage into the pipe, and the justices had not to decide on this summons the rights of the parties as to repair, which turns on different considerations. The Court was also of opinion that this was not a sewer at all in the sense that sewage could properly be discharged into it.

The County Council Tramways. The Report of the Highways Committee of the London County Council on the working of the tramways has just been issued. As regards the tramway systems south of the Thames which are worked by the Council themselves, the figures appear to show that an actual profit of something less than 1 per cent., without renewals, income tax, etc., is the result of the year's working. The advocates of municipal enterprises, however, can point to the fact that the result is more favourable than in the past year, and also can refer to the

number of passengers conveyed, viz., some 31½ million, at an average of something under a penny per passenger. There is, moreover, reason to believe that the working expenses will diminish when the systems are permanently established. It is interesting to note that even under present conditions the expenses of electrical traction—7.49d. per car mile run—compare favourably with horse traction, which is stated to work out at 10.23d. The systems being in a transition stage, it is impossible to criticise the figures too closely, but it is obvious that a most substantial increase must be shown to make the undertakings profitable concerns, and at present it would appear that they are not upon a commercial basis, since there is no adequate rate of interest forthcoming on the large capital involved, and thus the low fares are obtained at the expense of the ratepayers generally.

Submarine Groynes. INVESTIGATIONS made during recent years have established the fact that on certain coast lines the encroachment of the sea is very largely the result of erosion taking place below low-water level, the first effect being that the natural foundations of the shore are undermined, and the second that the beach subsides into the hollow created. With the object of providing means for guarding against developments of this kind Mr. Allanson-Winn, of Dublin, has devised a simple but ingenious type of groyne which can easily be applied in any depth of water. The groyne consists of a chain cable, to which is attached a continuous series of crates, faggots, or other objects, forming with the chain a flexible hedge. One end of the chain is secured to a pile, driven at low-water mark, and the other end is anchored out at sea in the required direction. When once fixed in position the groyne commences to intercept sea weed and other travelling material, with the result that submarine currents are checked and the collection of material gradually extends to levels above. So far as we are aware no definite data are available as to the actual efficiency of groynes constructed in the manner described, but the method of treatment is one that should commend itself to engineers and others having the care of coast lines subject to deep-water erosion.

Hygiene in Industrial Works. No ONE can doubt that workmen and workwomen in factories are far better

treated to-day than they were twenty or thirty years ago. Still, manufacturers in this country are far behind their American *confrères* so far as concerns the adoption of improvements for the comfort and health of their workpeople. Americans do not usually spend money without the expectation of some return, and their opinion is that money laid out in the direction here indicated actually has the effect of increasing production, and improving the quality of work done. Those of our readers who have to design factory buildings and to advise upon such equipment as comes within the province of an architect will find some instructive particulars in a paper on "Sanitary Betterment in Large Industrial Plants,"

contributed by Professor Burrage to the *Journal of the Western Society of Engineers* (Vol. X, No. 1). The illustrations in this paper show departments and hygienic appliances for industrial works, which are rarely to be found in Great Britain. Among these are emergency hospitals, rest, dressing and wash rooms for girls, wash rooms, clothes lockers, and shower baths for men, and clothes lockers and baths for foundry employees. All these are views taken in the works of successful business firms, and we quite believe that architects might accomplish good work in the interests of sanitation if they would urge the necessity for similar conveniences when undertaking the design of new industrial establishments.

The Railway Congress and Concrete-steel. A WELCOME sign of the times is given in the conclusions of the International Railway Congress. Due recognition is therein made of the many important applications of concrete-steel on railways and of the undoubted fact that it is able to compete successfully with timber, masonry, and steel. Railway engineers have now placed on record their conviction that tests of reinforced concrete structures, theoretical researches on the question, and the results of practice justify the conclusion that such structures deserve to be strongly recommended. This is a very satisfactory and sensible pronouncement, which we hope will be taken to heart by railway engineers and managers in Great Britain. We may add that the practical absence of maintenance charges, and the facility with which unusual or difficult conditions can be met, are additional arguments in favour of concrete-steel construction.

Electric Traction. SEVERAL papers on electric traction were read at the recent International Railway Congress at Washington. The most interesting subjects discussed were the speed at which electric trains should be run, and whether it is necessary to protect the conductor rail for the whole length of the line. The experiments on high speed electric traction in Germany between Marienfelde and Zossen have proved that high speeds could only under most exceptional circumstances be economical, as the consumption of energy is excessive. The running of trains at 125 miles an hour between ordinary trains would upset the time-table and make the ordinary traffic impossible. It would be necessary, therefore, to build special lines which must be practically straight, and the road bed would need to be wide so as to allow a greater distance between the trains. Level crossings and junctions would not be permissible, and thus the capital required for such a line would be enormous. Electric traction, however, is specially adapted for the running of a frequent service of light trains. Mr. Aspinall, of the Lancashire and Yorkshire Railway, gave interesting data of the working of the Liverpool-Southport Railway. The working costs are apparently greater than with steam. As steam could not give such a rapid service it is perhaps hardly fair to compare the actual working costs with the hypothetical working costs for steam. The wages bill is smaller, and the great

improvement in the carrying capacity augurs well for the future. Mr. Wilson of the North-Eastern Company stated that electricity admits of a better utilisation of existing lines and that the improved service leads to increased receipts. It was generally agreed that goods traffic could only be handled economically by electricity in a few special cases. It was disappointing that practically no exact data as to the cost of operating trains electrically were given. The conclusions arrived at by the Congress are not of great importance. Electric traction is recognised as an "important auxiliary of steam traction," and "it would seem that with the third rail, as now used, security can be secured under favourable conditions without it being necessary to cover or protect the third rail for its entire length." What we want, however, is an exact definition of "favourable conditions." As it stands the conclusion adopted by the Congress only shows that it is necessary to protect the third rail.

An Important Canadian Bridge. IN a paper read before the Canadian Society of Civil Engineers in April Mr. J. L. Morris gives a description of an important railway and highway bridge across the east and west branches of the Ottawa River just above the junction with the St. Lawrence River. The western section is 1,412 ft. long, and includes one truss span of 200 ft., eight truss spans of 140 ft., and two plate girder shore spans of 46 ft. The eastern section is 1,120 ft. long, and includes seven 140-ft. truss spans, and two 70-ft. plate girder shore spans. The embankment between the two sections is of earth, the length being 2,100 ft., while at the other end of each section is a trestle approach 2,000 ft. long. The bridge spans are erected on masonry piers with concrete and pile foundations. In addition to the central railway track two roadways are provided, one at either side. A point worth noting is that the contract for the sub-structure was let to a New York firm, who were unable to carry out the construction owing to the great risks involved. Consequently the contract had to be transferred to a Canadian firm of contractors, who overcame all difficulties and completed the masonry in the west channel in five months, and in the east channel in three months. If anything like this had occurred in the United States there would have been much blowing of trumpets.

Union of Benefices: Diocese of London. THE Bishop of London has issued a Commission to consider and report upon the expediency of the proposed union of the benefices of the rectories of St. Margaret, Lothbury, and All Hallows, London-wall, and of the demolition of one of the two churches. With the former parish are already united those of St. Christopher-le-Stocks (Bank of England) and St. Bartholomew-by-the-Exchange, with four others in the vicinity. The Church of St. Margaret, of which the chancel window and altar stand over the course of the Wall brook, was rebuilt in 1690 at a cost of 5,340l. 8s. 1d. after designs by Wren. The fabric was restored by Sir G. G. Scott; in the course

of repairs made twenty years ago the galleries were removed, the pews were lowered, and the west window was opened out. Remains were then found of the former structure of temp. Edward II., as enlarged in or about 1440 by Alderman Robert Large. The richly-carved font-bowl, similar to that of St. James, Piccadilly, is attributed to Grinling Gibbons. In our number of July 18, 1896, we published Mr. H. Inigo Triggs's measured drawings of the chancel-screen, with details, and a plan of the church. The screen, of carved oak, and removed thither from the church of All Hallows the Great, Upper Thames-street, has a somewhat obscure history; but the general belief is that it was given to All Hallows by, or at the instance of, James Jacobsen (*obit* 1680), a native of Hamburg, to commemorate the former settlement of Hanse merchants in the adjacent Steel Yard. The carving is apparently of Queen Anne's day—the coat-arms at the top are of Charles II. All Hallows, London-wall, is separated from the gardens of some houses in New Broad-street by a piece of the City wall, of which a length of about 150 ft. was exposed during the construction of the adjacent Blomfield House in the spring of 1885. The vestry stands, it is said, upon a bastion of the wall. The church was built in 1765-7, after designs by the younger Dance, in place of one depicted in W. H. Toms's print from a drawing by R. West, 1736, reproduced in the *Builder* of April 25, 1885. The late Sir Arthur Blomfield renovated the fabric in 1897-8, and in 1895 the Metropolitan Public Gardens Association laid out the churchyard. The church contains a monument, with bust, of John Patience, the architect, and one of Prebendary Beloe, rector, the translator of Herodotus and librarian of the British Museum. Sir Nathaniel Dance painted and presented the copy of Cortona's picture—Ananias restoring sight to Paul—over the communion-table.

York Minster. A LETTER signed "John H. Fearnley," in *Tuesday's Times*, replies with indignation to the suggestions that the work being carried on at York Minster is useless, and among other things asserts that there must have been flying buttresses on the north side of the nave before, because the springers for them are there on the tops of the aisle buttresses. It shows a curious degree of ignorance if the writer of a letter on such a subject really does not know that there are numbers of cases in English mediæval architecture where both the springing stones and the abutment stones for flying buttresses have been built in, but the buttresses have never been carried out. And if the flying buttresses on the north side of York nave ever were built, why were they removed? Can Mr. Fearnley explain that?

Miss Fortescue-Brickdale's Pictures. UNDER the title "Such Stuff as Dreams are made of" Miss Fortescue-Brickdale exhibits at Messrs. Dowdeswell's Gallery a second series of her interesting imaginative water-colour pictures, in which fine colour and composition are made to subserve weighty moral and allegorical

meanings. Some of these are obvious enough, at all events after a few moments' study; some are so elusive in their suggestion that one cannot feel sure of reading the intended meaning. "The Well of Tears," for instance, is a fine decorative picture, but we cannot profess to understand its point exactly, nor that of "The Poet," where the poet enters the door of a house, opened for him by a winged figure who holds conspicuously a bunch of keys. But in pictures of this kind one does not always want an exact interpretation; they suggest a play of fancy, and that is sufficient. "Love and his Counterfeits," where a procession of figures representing genius, wealth, and other attributes, come up to the lady who waits in the doorway of a castle, while Love remains sadly in the background, is pointed enough, and a fine work in every way, for Miss Fortescue-Brickdale is never (or very rarely) tempted to forget artistic design in her allegories. Her method is essentially decorative; they are nearly all foreground pictures, in which the figures and their immediate accessories occupy the whole picture, and are designed with special reference to effect of colour. Some of them, such as "Time and Immortality," would furnish excellent suggestions for treatment on a larger scale in stained glass; many of them would make admirable mural paintings. Among the most interesting of the works in subject, are "Truth and Tradition," where a schoolboy in mediæval dress in the foreground, his back to the spectator, is confronted by a crowd of fantastic figures each ready with its own lesson, while the nude figure of Truth is just noticeable far in the background; "Who goes Riding By?" a scene on the rampart of a castle, where a little boy looks over to see someone whom we cannot see; and "My Last Duchess," a stiff early Italian portrait in profile of a lady, flanked by the "curtain" which was drawn back only by the Duke himself—a very interesting creation in painting of the portrait described in Browning's poem. Browning also, we have no doubt, has furnished the hint for what is perhaps the most striking picture in the collection—"The Patriot." The battlements over the city gateway form the foreground, on which the head of the "patriot," with a sad and noble countenance, is stuck on a pole, while above it hovers an angel in bright armour holding a crown over the head; the city is seen below. The ghastly incident of the spiked head is managed so as to be less shocking than might have been expected, and the armed angel is splendid; it is a picture that makes its impression on the mind even more forcibly than the poem which suggested it.

The Pastel Society occupies all the walls of the Institute of

Water-colours Rooms in Piccadilly, laterally at least, though they are not hung very high vertically. Pastellists may be divided into three sets; those who try to make a pastel look like a painted picture; those who regard it as a medium for eccentricity or for limelight effects; and those who treat their subjects with a recognition of the special character of a material which is laid on

with points and in batchings and not with a brush. These latter, who are the true pastellists, are, we fear, the minority in an exhibition which contains a good deal that is ugly and crude. Pastel lends itself very well to figure studies, of which the best here is Mr. Strahan's "The Bathers" (159); there are others, such as M. Roll's "Etude" (194), which are ugly to a degree that is repulsive, and M. Louis Legrand's "L'Amante" (217) is absolutely vulgar. Among the landscapes the different way of regarding pastel is well shown by comparing Miss Wilson's two landscapes (94, 95), which are very pretty but too obviously efforts to make pastel do the work of water-colour, with Mr. Bertram Priestman's "A Misty Sunset" (215), which is really a landscape treated in the method properly characteristic of pastel, and could be taken for nothing else. The same may be said of Mr. Livens's scene entitled "Fresh Grass" (107), in which we should say he owed something to the study of M. Henri Martin, an oil-painter who paints in pastel style. M. Ménard's "La Baie d'Ermones" (36) is a piece of sheer scene painting; and there are some very highly finished figures and portraits which have none of the touch of pastel, and might almost as well be brush-work; among these, however, Mr. St. George Hare's "The Kiss" (118) is really pretty. As an example of the very best style of pastel treatment we may take Miss Sutro's "An Old Street, France" (108), which is admirable; it is worth while to notice how the tone of the shadow is broken by touches of colour which nevertheless do not assert themselves separately, but blend with the whole; her "Evening" (110) is another very good street scene. Among other bits of real pastel work is Mr. Terrick Williams's "A Brown Sail, Concarneau" (3); we notice that he adopts the method of outlining his patches of colour with a thin dark line; a rather conventional method, but it gives character and precision of effect. Mr. Bernard Partridge's two very different works, "The Princess" and "Watching the Rehearsal" (37, 38), are both full of character. We may mention also Mr. Melton Fisher's "The Mirror" (34); M. La Touche's "Le Bassin de Bacchus" (182)—pastel exactly suits M. La Touche's class of effect; Mr. Grosvenor Thomas's "The Bend in the River" (186), but his "Seascape" is very bad; Mr. Grierson's "The Goose Girl" (214); and M. Gaston Guignard's "L'Abreuvoir de Troupeau" (243).

At the Fine Art Society's Gallery is a collection of what are called in the catalogue (rather ungrammatically) "Irish Water-colours," but should rather be termed "Water-colour paintings of Irish scenes," by Miss Mary Barton. There is a considerable interest in seeing collectively a series of works illustrating the character of one country; and the scenery of Ireland has been far less painted than that of Scotland. It is difficult to say, however, whether the prevalence of warm and purplish tones in the landscape is really a characteristic of Irish scenery, or an idiosyncrasy of the artist's method; but we are inclined to credit Miss Barton with giving the

true colour of the scenes. Apart from local interest, the drawings are of very high character in themselves. Among the most effective are "Glenveagh Lake, Co. Donegal" (4), with its bright yellow flowers in the foreground; "From Glengariff, Co. Cork" (10), a landscape seen from beneath the shade of two large trees whose branches form a frame to it; "Across Lough Swilly" (27); "Errigal Mountain" (36); "Mountains near Dundalk" (42), and "Autumn in Muckcross" (54), a vista down an avenue of trees. Among scenes which seem to bring Ireland home to us are "Carrying Home the Turf" (25), which is slung on a donkey commanded by a pretty peasant who sits just on the tail of the animal, and "A Farm near Rathnellen" (44), where the picturesque element in the scene is mainly due to the overgrowth of a riot of wild flowers and weeds which seem to have it all their own way. Miss Barton treats buildings well, as we see in her drawing of the characteristic old stone cottages at Falcarragh (19), and in "Old Houses, Thomastown, Co. Kilkenny" (72), which is one of the best in the collection. In another room is a small collection of works by the late Mr. Onslow Ford, some of them bronze replicas of familiar works; the two life-size figures we do not remember to have seen before.

As most of our readers know, Mr. Julian C. Rogers has relinquished the office of Secretary of the Surveyors' Institution after an official connexion with that body of about thirty-six years, and an invitation has been made to members of the Institution to subscribe towards the painting of his portrait as a mark of appreciation of his many services to the Institution. During his period of office as Secretary the Institution has shown a remarkable increase in membership and influence, and there can be no doubt that this result is largely due to the untiring and able efforts of Mr. Rogers, who not only carried on the ordinary secretarial duties of such an office, but who also edited a large number of volumes of the Institution's *Transactions* and *Professional Notes*. Mr. Rogers is well-known to most London architects and surveyors, and his urbanity and kindness to those he came in contact with must have made him many friends, who will, no doubt, be glad to take the opportunity of showing their regard for him. Mr. A. Goddard, the new Secretary of the Institution, is the hon. secretary of the fund, and subscriptions of a guinea or less should be forwarded to him by the end of July.

MISSION HALL, NEWCASTLE.—The foundation-stone of St. Monica's Mission Hall, Wingrove-road, Newcastle, was laid on the 27th ult. The hall is to be built of closeburn stone and redressed brick in the Gothic style of architecture, the dimensions being 62 ft. 6 in. long by 32 ft. wide. It is proposed to seat 250 people. The cost will be about 1,150*l.*, exclusive of land, road-making, and drainage charges. Mr. J. W. Spencer, architect, designed the building.

NEW PREMISES, UXBRIDGE-ROAD, LONDON.—A large block of business premises, consisting of ten shops and upper parts, is being erected with a frontage of 203 ft. to Uxbridge-road and return frontages to Bloemfontein and Ormiston roads. Owing to differences with the County Council as to the frontage line, the work had to be suspended for some time, but is now being rapidly pushed forward. Messrs. L. Whitehead & Co., Ltd., are the contractors and Messrs. Palgrave & Co. the architects.

ARCHITECTURE AT THE ROYAL ACADEMY.—III.

ALTHOUGH the domestic architecture shown at Burlington House may be said to maintain an average standard, containing much tasteful and quiet design in works of a small nature, there is an unusual dearth of large houses. This, perhaps, is the natural result of the trend of modern social conditions and requirements. In the matter of importance, Mr. R. W. Schultz's "Pickenham Hall, Norfolk" (1414) may be cited as the leading example. The plan appears to indicate that the scheme is a rebuilding wherein a very small amount of old work is retained which cannot be considered to have influenced the design as a whole. The house consists of a main block, containing the best apartments, while in a lower wing the domestic offices are placed. A Georgian-like character is given to the grouping of the fronts, the flatness of which is disturbed by nine bay-windows; but a free, roving treatment is rendered to the details, and is so uniformly distributed that a certain interest is lacking in manner. The plan is straightforward, with not a great deal to excite imagination; but the lobby or porch entrance to the drawing-room, though providing a quiet corner at that end of the room and a means of approach to the boudoir, is not a good point. The slight pencil drawing scarcely does justice to the design, which, to our mind, is a welcome departure from the prevalent ideas of accurately reproducing the elemental parts of an XVIIIth century house.

The drawing of "House near Dublin" (1430) has plenty of information of what Mr. Carde, the architect, proposes, although the two ground plans are slightly at variance. Here is a flat V-shaped house entered at the angle, and upon the mean axis the hall is planned. The house is broadly designed, with deep sloping roofs to the garden front rising from verandahs on the ground story, but the same view shows that too much is made of the line at the intersection of the two planes of the building, that the effect is hard. Although the chimneys are interesting, and are probably of brick there is no indication of other materials; but the weak spot of the design is the strained planning of the offices. Mr. Ernest George (Messrs. Ernest George & Yeates) sends two charming water-colour drawings, of which No. 1463 is "New Loggia and Central Bay, Welbeck Abbey," good Palladian-like additions set in severe surroundings. The other drawing is a subject in acute contrast—"Central Tower and Carriage Porch, West Dean Park" (1468). This is a kind of late XVth century Gothic design built with flint walls and stone dressings. Neither contribution has a plan, and there is an absence of that sense of domestic fitness which we are accustomed to see in the work of this architect.

The work of Mr. Ernest Newton combines all that is best in the English home, always in a refined and restrained manner, and with much care bestowed upon the selection of materials. He exhibits three drawings of country houses, and to none of them are plans appended; but we were able to reproduce these, with the drawings, in our issue of April 29, 1905. No. 1513, "House at Triscombe, Somerset," is a large rough-cast dwelling, with parapets to the walls somewhat diminishing the apparent roof masses and partially hiding the dormer windows. There is nothing assertive in any of the parts, but the values lie in the study of the detail, its proportion and grouping. "Proposed House at Reigate" (1512) is a design wherein the roof comes into full play. The four two-storied plastered bays, around which the main cornice is carried, are, with other parts, charming features. No. 1519, "House at Bickley," is on somewhat similar lines, but without bay-windows. Here, again, is an eaves cornice, which is broken only by the parapet of the porch walls. A disturbing element is the size and position of the staircase window, but its setting is well considered.

Three delightful drawings by the same draughtsman are submitted by Mr. Guy Dawber, whose work is always free and admirably composed; symmetry such as is occasioned by an XVIIIth century influence is not a characteristic, but the accidentals are frankly accepted and harmoniously expressed. "Solom's Court, Surrey" (1561) is a house with an L-shaped plan, the main part having a brick ground story and a rough-cast upper

part. Stone is also used in windows and other places, but the variety in materials is thoughtfully blended and used to express the parts of relative importance. No. 1556 comprises two groups of buildings—an inn and a block of cottages at Sandon, Staffordshire. This is a somewhat extensive scheme, wherein the design is full of points of interest both in the matter of detail and in preserving village tradition, and all the parts are made to express their respective functions. "House at Denbigh" (1551) is the smallest of three admirable pictures, and was published on June 10, 1905, in these pages. It is a small residence, simple and homelike, well thought out in the use of materials. It is a significant phase of current design to find ornamentation giving place to mere material and skilful labour, and we are inclined to attribute the change to the eclectic results of the arts and crafts controversies of recent years. "Brackencliffe, Scarborough" (1555), by Mr. W. H. Brierley, is a house excellent of its kind, but much disturbed by broken roofing; greater breadth in this respect would be to the advantage of the architecture. There is much vigour in places, and some of the detail is charming, but the drawing does scant justice to the work. Mr. Prentice's "House at Newmarket" (1562) leaves us in doubt as to the nature of the various parts of the plan, and certainly the placing of the large Dutch gables, with their tiny windows, and the big intervening bays, does not throw any light on the subject. "Framework, Stoke Poges" (1568), by Mr. Gerald Horsley, is shown by a rather laboured line drawing (illustrated in our issue of May 13). The grouping is picturesque in a sense, but the battlemented block which includes the entrance hall does not seem to belong to the rest, and indeed the plan is not one that lends itself very well to a dignified exterior. No. 1506, "House near Haslemere," by Mr. E. J. May, is a building with an interesting plan. The scheme is shown by three ink sketches, which hardly do justice to the excellence of the design. The porch is an attractive piece of work in a house which is well conceived for the actual materials employed. A large stone-mullioned house, "Maesycragian Manor, Carmarthenshire" (1587), by Mr. A. Mitchell, is illustrated by a good coloured drawing, and is a solid-looking subject, to which we have referred on a previous occasion.

The plans and three coloured views of "The Choir School House, New College, Oxford" (1588), of which Messrs. Nicholson & Corlette are the authors, enable the spectator to gain a clear idea of the proposed building, and it is at once seen that the plan is very convenient and the design very suitable for the purposes of the house. "Parkwood, Henley-on-Thames" (1608), is a vigorous drawing (made on the spot by the architect, Mr. W. Flockhart) of a large house, with rough-cast walls, glazed brick plinth, and tiled roofs. In many respects the design may be considered Dutch in character. There are balconies, oriels, turrets, stopped gables, and many more kinds of features, which, happily, are kept under control by the single line of the steep main roof. There is much design in the scheme, and a plan would have been an aid to the appreciation of the causes which have produced so many sorts of windows at so many levels. There is, however, much dignity, combined with a vigorous freedom, which we are pleased to see. Mr. Flockhart pursues the idea of high-pitched roofs, stepped gables, and turrets in "New Presbyterian Church Hall and Class Rooms, Marylebone" (1419), and again the variety of parts is kept in restraint by some large wall masses. The "House in Kensington Palace Gardens" (1620) is not what we have been in the habit of studying from the hand of Mr. J. J. Stevenson, for the design is ordinary and without interest.

No. 1420, "Summerfield, Abingdon," by Mr. H. Redfern, is a very tasteful little house, which we imagine to be principally of rough-cast. Details are excellent, and the fact of the plan showing the garden surroundings, which most plans omit, is an aid to the intelligent appreciation of the author's ideas. Mr. Geoffrey Lucas's "Workmen's Cottages, Letchworth" (1412), is, we hope, the basis of much that will eventually be erected in the much-talked-of garden city. No. 1461 is a "House at Croydon," by Mr. W. F. Harber, and, although given without a plan, conveys the impression of being skilfully

contrived to produce easy roofing. Certain details, however, prove the author to be restless. There are, for instance, three fair nymphs done in plaster on the sides of the bay-window which are quite discordant, apart from the life-size dimensions and from the fact of their driving the first floor windows to a height out of which it would be impossible to see.

No. 1472, by Mr. G. L. Alexander, is a good drawing of an interesting "Stable at Womersley, Surrey." No. 1471 is a small, but charming, piece of design for "The Grapes Tavern, St. Mary Axe," in which a nice overhanging sign is introduced. The author, Mr. N. Evill, also sends "House at Tidenham, Gloucestershire" (1456), which is one of the best bits of cottage design in the architectural room, and is rendered by a very tasteful drawing. The key to the charm of this work appears to lie in the easy management of the roofs, where gables are made to overhang two-storied bays. The nature of the materials, however, is not clear.

Apart from the good drawing, No. 1499, "Entrance Doorway, Alms-houses, Wood Green," of which Mr. A. W. S. Cross is the author, is excellent architecture, which creates a desire to see more of what is probably a good design; especially acceptable would be a plan. "Cottage at Bledlow, Bucks" (1603), by Mr. P. M. Horder, is a pleasing rough-cast house indicated by two plans and two views, in which it is seen that the place has well-designed garden surroundings. A three-storied double cottage with central chimney is a good piece of small domestic work (1622). Mr. R. Marchant, the author, has turned to account most of the space in the high-pitched two-storied roof, whereof the gable is covered with weather-boarding, while the plan is made easy and serviceable.

DECAY AND PRESERVATION OF STONEWORK.

By W. R. PURCHASE.

THE necessity of choosing a good building stone for durability is well known, but, unfortunately, too little attention is, as a rule, given to the selection of the stone, in order to obtain as nearly as possible a perfect structure.

Yet, however careful the selection may be, it should be understood that there is no kind of stone, whether the hardest and most intractable of the syenites or granites, or the softest lime or sandstone, that is not perishable in a greater or lesser degree in the course of time.

The physical forces and agencies within and without which produce this effect are apparently invisible, although always present, each acting in its own way with the same result—that the stones begin to disintegrate and gradually fall away into dust.

Hence scientists tell us of the divine immutable laws that govern the universe—namely, that nothing exists in nature but what is likely to change its condition and manner of being, and that all bodies possess the materials of which they are composed only for a limited time, during which some powerful agent effects their decomposition and sets the elementary particles at liberty, again to form other equally perfect combinations.

Therefore, it is obvious that the durability of stone used for building purposes is only of relative value.

To discover the causes of decay in stone, and the means of avoiding the evil in future, is an investigation of some difficulty, because of the great number of stones, varied in composition and character, that are used for building purposes in this country.

Some advantage may, however, be derived from the attempt, by eliciting intelligent discussion, suggesting inquiries, making research amidst old buildings, directing experiments, and arranging sound practical observations.

By this means certain conclusions may be inferred, so that defects may be remedied in existing works and improvements suggested for the future.

A high authority has observed that, "in modern Europe, and particularly in Great Britain, there is scarcely a public building of

recent date which will be in existence a thousand years hence. Many of the most splendid works of modern architecture are beginning to decay in what may be justly called the infancy of their existence, if compared with the dates of public buildings that remain in Italy, in Greece, in Egypt, and the East."

Should this be true, it is a serious outlook, and, therefore, it follows that the student should have a full and accurate knowledge of the general structure of rocks, as well as of the situation where the best materials may be obtained, the composition of the stone he uses, and the destructive agencies that it will have to face, so as to direct his choice in the selection of particular stones, and enable him to estimate the advantages to be gained from their proper application for building purposes.

It should not be forgotten that a bad selection of stone cannot be rectified when once used in a building, and is a lasting testimony to want of care and experience; while a good selection remains a permanent record for posterity.

Chemical tests and analyses, to determine the quality of a building stone for durability, are admitted by practical men to be somewhat unreliable.

The processes which are successful in the laboratory of the chemist are generally of little value when brought into practical use; for chemical analysis will only give the constituents, and microscopic analysis the physical construction of a stone; neither has as yet been proved to have any direct relation to its weathering quality. And, although stones have been subjected to severe tests in the laboratory—such as being dissolved in various acids, saturated with salts, ground into semi-transparent discs, disintegrated, pulverised, baked, and boiled, and treated in various other fashions—yet none of these processes have as yet furnished sufficient data by which a correct judgment or estimate can be formed as to the weathering properties of any stone.

This is, perhaps, a sweeping assertion to make, but a striking illustration of its truth has been furnished in no less important a case than the new House of Parliament at Westminster, erected 1839 to 1860, a sufficient time having now elapsed to enable one to form a judgment from actual experience as to the weathering qualities of the stone used. And, one may say, since this building was erected, little (if any) advance has been made in chemical investigation of the properties of building stones.

Before building operations upon the new Houses were commenced, a Royal Commission was appointed, comprising eminent chemists, geologists, and others, who visited the principal quarries in England and Scotland, and finally selected a magnesian limestone (dolomite) from Bolsover, Derbyshire, which was afterwards discarded, or set aside, for "Aston" stones from Yorkshire.

The stones selected proved, however, to be quite unsuitable for the purpose, being ill-adapted to withstand the deleterious influence of the surrounding atmosphere, and the result is that this splendid building is fast going to decay; thousands of pounds have already been spent on restorations and "preservative" solutions, but these efforts have failed to arrest the rapid decomposition that is taking place.

Great things were expected of this Royal Commission, its appointment being the first step with a scientific purpose which the Government of the country had ever taken in respect of practical building. The result, however, as regards the selection of a suitable stone, has, as we have seen, been disappointing to a degree, and is nothing less than a national misfortune.

Some few years since I had the opportunity of examining the stonework on various portions of the building, including the central and clock towers, from scaffolding, and was astonished at the general decay and disintegration taking place.

In some cases the stonework was honey-combed or pitted in holes to 1 in. or more in depth, and the mouldings eaten away to such an extent that the general contour was lost. Especially did this occur on the isolated pinnacles and finials of the towers.

A notable fact may be here stated, that some of the ornamental parts of the stonework had been gilded with gold leaf; on these portions the weather had apparently no effect—

the original face as left from the chisel could be plainly observed, and stood out from the weathered face quite $\frac{1}{2}$ in. One would not wish to gild the whole of the stonework, but a preservative such as this evidently offers a suggestion for arresting the decay of stone.

The supineness of the authorities is somewhat surprising, inasmuch as no heroic effort has been put forth to arrest the decomposition so rapidly taking place; and it is a serious matter to contemplate what will be the condition of the building after it has stood the vicissitudes of the weather for another half century.

Millions of money are freely spent on costly militarism that tends to retard civilisation, whilst the public buildings of the country, which should be amongst the glories of our land, are allowed to starve on a small pittance doled out with a niggard hand; the result is that some of the buildings are getting into that condition that Ruskin speaks of as "those grey heaps of deeply-wrought stone."

But this is a digression.

In the foregoing remarks there is no wish to depreciate or disparage the true value of tests by chemical analysis, but rather the contrary. These, however, should be confined to ascertaining the component parts of the stone, its cementing material, the absorption of water, which gives a fair indication of the power of a stone to resist rain and frost, the microscopic test, which is useful in determining the homogeneity of its structure, and others. In fact, there is no detail in connexion with stone that one should not be familiar with.

Without going into the scientific aspect of the causes of decay in building stones, it may be briefly stated, that the weathering power of a stone is dependant upon its physical structure, its composition, and the nature of the atmosphere in which it is placed. The most destructive agent that the stone has to contend against is rain, or a moist atmosphere, and also, in a minor degree, wind, frost, and smoke.

The air of populous and smoky towns is charged with various deleterious acids; these acids are dissolved by the rain, which penetrates the stone in a greater or lesser degree according to its physical structure, and combines with the constituents of the stone, causing it to ultimately crumble away, so that any contrivance that will check the admission of water will be most likely to succeed in arresting decay.

The wind, in some instances, acts destructively, as when it drives the rain with more or less force into the pores of the stone, and again when it carries away loose particles which have been dislodged by other means; but, on the whole, the effect of the action of the wind is to enhance the durability of the stone by drying out the moisture, and thus assisting its lasting powers.

The points which I should like to emphasise, if carried through in their entirety, would do something towards diminishing the preventable causes of decay in building stones.

They will be taken in the following order—namely, selection, seasoning, natural bed, working by hand and machinery, fixing, and cleaning down, arresting decay.

Selection.—In order to identify a good stone it is necessary to use one's powers of observation and judgment.

Examine carefully a building that has stood the wear of time and is subjected to a similar atmosphere to that of a proposed new building; note its general appearance and its condition as to soundness. Should tool marks be visible they can generally be accepted as a good sign. Next find out where the stone was quarried, examine carefully the various beds in the quarry, and from what stratum the stone has been obtained; note the weathering of exposed surfaces in the older portion of the quarry, and learn which part is liable to decay first and the conditions under which it does so.

Take every precaution to ensure getting the stone from a sound and compact bed, and one that is easily wrought and convertible.

It may not generally be known that most stones last longest in the particular locality in which they are found, and that the same quality of stone which weathers well externally in the neighbourhood of the quarry oftentimes goes rapidly to decay when fixed in another part of the country.

All stones are porous more or less, and those which readily absorb moisture should not be used for the external exposed portions of buildings, as when frosts occur the freezing of the water on the wet surface continually peels off the latter, and eventually destroys the ornamental work upon it.

This, however, is not a universal rule, as, although a stone may be very porous and absorbent, it may also be extremely durable, its durability depending upon the cementing substance which holds the grains together being strong enough to resist the physical forces acting upon the stone, such as the rain, frost, and wind. Examples of this are found in the durability of the shelly oolites, such as Ancaster, Barnack, Doulting, Ham Hill, etc.

These stones present a remarkably open and porous nature, and resist disintegration much better than might be expected from their appearance. This is due to the interstices being filled with a compact highly-crystalline cement.

Stones which exhibit distinct beds of stratification should, as a rule, be avoided, as in frosty weather they have a tendency to split along the planes of cleavage.

In selecting a good sandstone the grains should be compact and homogeneous, and on crushing a bit of the stone the grains should be lustrous, as those with a dull lustre are generally found in a stone that weathers indifferently.

In limestones, a stone of an open, powdery, and slightly cemented texture will, if exposed to the weather, decompose in a comparatively short space of time, whether fixed on its bed or in any other direction.

It is with the limestones, as with most other stones, that the goodness or power to resist decomposition depends chiefly upon the quantity and quality of the cementing substance by which the particles adhere to each other, and that stone which is closest in texture and contains the largest quantity of crystalline cement in the interstices between the grains will certainly be the least affected by external influences.

The weight of a stone has at times to be considered, and should be such as to suit the work to be carried out. In quay walls, piers of bridges, buttresses, etc., it is advisable to use heavy stones, as their weight adds to their stability; while for the filling in of panels in vaulting and similar work lighter stones are preferable.

In almost every quarry, but more particularly amongst the oolites, there are different qualities of stone, some tolerably good, others bad. The principal requisite is judgment to select that which is best.

A specification of masons' work should contain not merely the popular name of the stone, but also the correct name of the quarry and, if possible, of the particular stratum or bed, if there be an apparent difference in such a quarry.*

NEW MIDDLESEX COUNTY ASYLUM.

The new asylum at Napsbury was opened on the 3rd inst. The Napsbury estate is situated about two miles to the south-east of St. Albans, and has the advantage of a southern inclination, which secures not only a ready drainage, but also the maximum of sunlight and protection from the cold north and north-east winds; whilst the level plateau about halfway down the estate lends itself to the suitable distribution of the buildings with the best aspect and with extensive views from the windows. The plantations and timber trees scattered over the estate have all been carefully preserved, and the buildings adjusted to suit the trees, obtaining at once a picturesque and natural setting for the new buildings. The buildings consist of a main asylum for chronic cases, an observation and nursing hospital, five detached villas for patients, an isolation hospital, farm buildings, a residence for the medical superintendent, a home for the farm bailiff, and various cottages and lodges for attendants, labourers, etc., and are arranged for the present accommodation and treatment of about 1,200 patients, with a capacity for extension. A special feature is the provision of villas each for male and female paying patients, where sufferers may receive the

* To be continued.

advantages of a public asylum by payment of a reasonable fee. The buildings were commenced in 1900, when the council entered into a contract with Messrs. Holloway Brothers to put in the foundations of the main asylum. The superstructure of the asylum, the observation hospital, five villas, chapel, isolation hospital, medical superintendent's residence, farm bailiff's house, the septic tanks, the farm buildings, and the east lodge have been erected by Messrs. Chas. Wall, of Chelsea. The north and south lodges were erected by Messrs. F. Dupont and Co., of Watford; and the married attendants' quarters are now in course of construction by Messrs. A. Lewin and Son, of Kettering.

The ward blocks are arranged en *échelon*, with a southern aspect, and connected by branch passages to the detached corridor. Each block has its main and escape staircases and goods-lift, and is so arranged that an outbreak of fire will be localised to the particular block where it originates without the chance of its spreading to adjoining buildings. The staircases are formed of cement concrete, with York stone treads, and each block has its detached sanitary annexe with cross ventilated connecting corridors. The day-rooms, dormitories, single rooms, and attendants' rooms are floored with pitch pine boarding, coated with "Ronuk" polish. The sanitary spurs, corridors, etc., are paved with terrazzo mosaic. The warming is by Messrs. Doulton and Co.'s falence open fires, supplemented by hot-water radiators and pipes, with fresh air inlets to stoves and radiators, and with outlet flues connecting to ventilating turrets on the roofs. The windows throughout are double hung sashes. The lighting throughout is by incandescent electric light, and gas is laid on to each ward scullery from the mains of the St. Albans Gas Company.

The administration block contains committee rooms, the medical superintendent's office, clerk's office, telephone exchange, and quarters for the assistant medical officers; in the rear are the visiting rooms and general store. In the centre of the administrative portion of the asylum is the kitchen, 55 ft. long and 55 ft. wide, with sculleries and vegetable scullery, and store larders and pantries, with service rooms, lobbies, etc. The walls are lined throughout with glazed bricks, and there is ample provision of windows and lantern lights for ventilation. A complete gas and steam cooking installation has been erected here by Messrs. James Slater and Co., of London. Adjoining the kitchen, and separated from it only by a corridor, is the general dining hall, 111 ft. long and 60 ft. broad. The recreation hall is above the dining hall; it is 79 ft. long by 60 ft. wide, capable of seating about 1,000.

The observation hospital is a detached building, connected only by a subway for steam and other pipes with the main asylum; otherwise than with regard to heating, lighting, water supply, and laundry work, it is a self-contained building, upon similar lines to the main asylum, approached from the north with an entrance hall and fernery, all the blocks being detached. The south blocks are devoted to hospital convalescence and nursing cases; the east and west blocks are devoted to sick and infirm cases, for which a wide, sunny corridor is provided against inclement weather; verandahs are also attached, so that patients may be as much as possible out of doors. There is also a dining and recreation hall, and a complete kitchen, and ample provision for medical and nursing staff. In the front administration block there are provided rooms for photography, a museum, and research laboratory.

The villas are detached three-story buildings providing accommodation for 50 to 52 patients each in dining and sitting rooms and small dormitories, with separate hot water warming and services. The cooking for the villas will be conducted at the asylum and hospital kitchens. The isolation hospital is a complete building, situated near the railway siding, with accommodation for six patients. It contains a complete kitchen and laundry equipment and quarters for the staff.

The engineering work consists of three 30 ft. by 8 ft. 6 in. Galloway boilers, for supplying steam for heating and power, an electric light installation, with its engines and dynamos, booster storage battery

switches, cables, wiring, and lights; an artesian well, with deep well pumps and pumping engines, fire pumps, laundry engines, machinery and drying rooms, and the warming by hot water of the main asylum and observation hospital buildings. The rain-water and storm drainage of the buildings and estate is taken and discharged direct into the River Colne, and the soil drainage is collected in a separate system, and treated in a septic tank installation at the lower part of the estate, consisting of two septic tanks, four aerating bacterial filters, with an additional aerating jet-sprinkling filter for the effluent, which is then taken and treated upon the land in a meadow near the river. A new system of roads, nearly seven miles in length, is being carried out.

The works have been carried out under the architect, Mr. Rowland Plumble, by the following contractors:—Foundations of main asylum, Messrs. Holloway Brothers; the superstructure, hospital, detached buildings and farm, and the hot and cold water supplies, Messrs. Chas. Wall (Chelsea); the north and south lodges, Messrs. F. Dupont & Co. (Watford); the attendants' cottages, Messrs. Lewin & Son (Kettering); railway siding and branch line, Mr. Jas. Dickson (St. Albans); fencing and gates, Mr. J. Elwell (Birmingham); telephones, fire alarms, and bells, Messrs. Cox-Walker (Dartington); kitchen fittings and cooking apparatus, Messrs. Jas. Slater & Co.; bakery ovens and engineering, Messrs. W. F. Mason (Manchester); disinfectors, Messrs. Manlove, Alliott, & Co., Ltd. (Nottingham); douche baths and automatic water blenders, Messrs. Royles (Irlam); turret clock and bells, Messrs. Gillett & Johnston (Croydon); fire-proof curtain, Messrs. Merryweather & Sons; barn machinery and farm food cooking, Messrs. Harring & Son (Chesney); dairy machinery, Messrs. Bradford & Co. Under the engineer, Mr. W. H. Massey, M.Inst.C.E.:—Warming steam mains and laundry engineering, Messrs. Moorwood & Sons, Ltd. (London); steam boilers, Messrs. Galloways, Ltd. (Manchester); engines and dynamos, The Electric Construction Co., Ltd. (London); battery and booster, The Hart Accumulator Co., Ltd. (London); electric mains, The Western Electric Co. (London); wiring and lighting, Messrs. Wells, Rayner, & Co. (London); fire pumps, Messrs. Merryweather & Sons, Ltd. (London); water softening apparatus, Messrs. Lassen & Hjort (London); well pumps and engines, Messrs. Owens & Co. (Arlsey). Under the direction of Mr. Rowland Plumble and Mr. W. H. Massey:—Well sinking, Messrs. Thos. Tilley & Sons (London). The clerks of works for the architect are Mr. Chas. Iles and Mr. W. Finney; and for the engineer, Mr. O. U. Cooke.

ARCHITECTURAL SOCIETIES.

MANCHESTER SOCIETY OF ARCHITECTS.—On Saturday, June 3, the members of this Society visited Norbury Church, Derbyshire, a very interesting and unusual church. Originally there seems to have been a Norman nave, to which was added a XIVth century chancel, and on the south side a tower. Later, in perpendicular times, the nave was rebuilt, with a north aisle, and the spaces on each side of the tower were occupied by chapels; the latter are low, and the result is a charming bit of grouping both outside and inside. The great glory of the building is its magnificent stained glass, the colour of the XIVth century glass in the north and south windows of the chancel being something to remember most gratefully. The east window is rather a jumble of bits of XVth century glass from the nave, good in themselves, but not forming one design. The red brick Marton House adjoining well deserves notice. Wootton Lodge was next visited, by permission of Colonel B. C. P. Heywood, who entertained the members to luncheon, and devoted the afternoon to showing them round the house and its beautiful gardens. The house is an excellent example of a stately Elizabethan mansion, with very beautiful natural surroundings. The entrance front is singularly fine; two low buildings, stable, etc., mark the angles of the enclosed forecourt, through which an elliptical drive leads to a great flight of steps rising to the main entrance porch. The porch is carried right up to the

parapet, and is enriched with heraldic carving. On either side of this central projection are long windows four stories high, with great mullion and transome windows, while just visible round the corner on either flank are similarly lofty circular bays. The front is surrounded by a balustrade. From a slight hill in front of the house the dignified symmetry of this front and its forecourt is very impressive, and one regrets the loss of the tree-shaded avenue which in former times led over this hill straight to the entrance gates. The gardens are very delightful, with terraces and broad flights of stone steps, and a most charming and unexpected little "frond garden" on the top of a crag behind the house. On Thursday evening, June 8, the Society visited the Manchester Arts and Crafts Museum, attached to the School of Art. Brief comments on the principal objects of an architectural character were made by Professor S. H. Capper and Mr. P. E. Corbett, and the Head Master, Mr. R. Glazier, gave a most interesting account of some of the handicrafts represented in the museum, notably of glass and pottery.

THE EDINBURGH ARCHITECTURAL ASSOCIATION.—On Saturday last week a number of the members of this Association paid a visit to Falkland. Permission having been granted by Lord Ninian Stuart, the party visited the Palace and grounds, where the recent restorations by the late Marquis of Bute were seen. Mr. Harold O. Tarbolton, President of the Association, acted as leader. The Town Hall was next visited, where a number of old charters were exhibited by the Provost. By permission of Sir John Murray, K.C.B., the members of the Association were also enabled to visit the House of Falkland. At the conclusion of the visit the members of the Association were entertained to tea at Millfield House by Mr. Charles Gulland.

ARCHAEOLOGICAL SOCIETIES.

LEICESTERSHIRE ARCHITECTURAL AND ARCHAEOLOGICAL SOCIETY.—The Leicestershire Architectural and Archaeological Society celebrated its jubilee recently by an exhibition at the County Assembly Rooms, followed by a luncheon. The exhibition, which was formally opened by Mr. Everard, comprised a collection of Leicestershire antiquities, such as old coins, books, parchments, ornaments, pottery, drawings, etc. Mr. P. W. P. Carlow-Briton, F.S.A., President of the British Numismatic Society, lent a collection of Old English coins. The coins in question, which were all found in Leicester, date from the time of Æthelred II. to that of Henry II., and number eleven in all. Mr. T. W. Everard sent five spoons and a Roman jar, and the Corporation of Leicester also lent a number of documents. These included a very fine copy of a *Serum Missal* containing interesting borders and wood cuts. There were also a number of Simon de Montfort's charters, in one of which he introduced the law of primogeniture into Leicester, instead of inheritance by the youngest son. This is dated October 22, 1255, when Henry III. was King. Another relates to a curious old tax levied on the gable of every house fronting on High-street. Large collections of medals are shown by Mr. B. W. Russell and Major Freer. One hundred and three different XVIIIth century brass tokens of Leicester and Rutland come from Mr. Joseph Young, who also sends a collection of twenty-five true Anglo-Saxon and Norman silver pennies, struck in Leicester between 978 and 1170, together with fifty-seven silver pennies struck in Chester. Mrs. Sloane, Mr. H. Simpson-Gee, and Mr. G. M. Henton have on view water-colour drawings and etchings of old buildings in the borough, including the Huntingdon Tower, which used to stand in High-street. A large number of very interesting architectural drawings are sent by Messrs. H. Lawrence, Albert Herbert, C. W. Hodges, J. C. Traylen, G. Nott, and Oliver Shenton, but perhaps the finest exhibit is that of Mr. J. W. Spurway. This consists of an exceptionally large and interesting collection of Roman antiquities, all found in Leicester. In it are included sixteen cases of coins, commencing with Julia, 39 A.D., and concluding with Florianus in 276; rings, fibulae, brooches, pins, etc., and a large collection of pottery and different Roman wares. Possibly one of the most noticeable articles from a borough point of view is a small silver mace. This was given by King Charles I. to the Corporation

of Leicester in 1641, but was sold with the other articles of the regalia after the passing of the Reform Bill in 1836. It is now the property of Messrs. James Usher & Son, of Lincoln. All these articles, together with many others, were catalogued by Mr. H. H. Peach. Soon after one o'clock the members partook of luncheon. Mr. W. T. Everard presided, and submitted the toast of "The King," which was duly honoured, and subsequently the Chairman said he had great pleasure in presenting Colonel Bellairs, who might be described almost as the father of the Society. The address was subscribed for by members of the Society, and he had very great pleasure in making the presentation. The address was assigned and carried out under the supervision of Mr. Fletcher, of the Leicester Technical School. Colonel Bellairs thanked them heartily for the presentation. The Chairman then submitted the toast of the Society. He said it had been inaugurated fifty years. The first meeting was called by Mr. Ingram on January 10, 1855, who was then acting secretary. When it started there were about forty members, and now the membership totalled over 260, besides honorary members, and at the last meeting twelve new members were elected. The Chairman then referred to the work of the two secretaries, Colonel Bellairs and Mr. Freer. The exhibition was due to Mr. Freer, for he had put in days of hard work in connexion with it. Major Freer returned thanks, and said that Mr. Spurway had been indefatigable in getting together a magnificent collection of Roman antiquities, which had occupied him during the past thirty years.—Three papers were then read. The first was by Mr. C. H. Read, Secretary of the Society of Antiquaries, London, and was entitled "The Museum, Old and New." Leaving out the zoological, technical, and those of a scientific type, there were two kinds of museums—the archaeological and the art museum. What was the archaeological museum, or what was archaeology? He thought it might be taken to be the study of man's works with the view of illustrating his history and progress from the earliest time to the modern epoch. That being so, the archaeological museum should contain anything and everything which could help towards this end, and, further, it must not be forgotten that such collections could have no concern with the beauty or attractive character of the object of the collection. If the articles should by chance be of an artistic character, that, no doubt, gave them an added value, but the great point was they should be characteristic of their kind and time. Works of beautiful art, cherished for their artistic qualities, found a more fitting place in the museum of art. With regard to a local museum, he said its primary function was to illustrate the archaeology of its own district. It was in this special value that the museum came into direct relation with the local society. If the work of the two was to produce the best results, its relations must be of the most intimate character. Thus the society would undertake excavations, the relics going to the museum and the records of the work being included in the transactions of the society. Both were thus benefited. He then impressed on those present the necessity for a competent supervision of excavations, and said it would be well if they could have some regulations to that effect.—Mr. J. A. Gotch, F.S.A., read a paper on "The Renaissance in Leicestershire." The examples which were of any importance were Bradgate Park, where there were ruins of the time of Henry VIII.; Lounde Abbey, Ragdale Old Hall, Stapleford Hall, the Old Town Hall, Leicester, and the Leicester Abbey. He briefly dealt with these various places, and said nearly all of the actual Renaissance works were executed in the early part of the XVIIth century. This showed that the years immediately preceding the great civil war were times of prosperity to the gentry of Leicestershire. One noticeable feature in the buildings was an absence of defensive power; the houses being built for comfortable living. Another feature was the symmetry of disposition, for they had gable to match gable, window to match window, and chimney to match chimney, and this sometimes made the result ludicrous.—The Rev. W. G. D. Fletcher, F.S.A., then gave a brief history of the Society. A vote of thanks to Mr. Everard, proposed by Canon Rendell, terminated the meeting.—*Leicester Advertiser.*

NORFOLK AND NORWICH ARCHEOLOGICAL SOCIETY.—The annual meeting of the Norfolk and Norwich Archaeological Society was held recently at Norwich Guildhall, under the chairmanship of the President, General W. E. G. L. Bulwer. The report and balance-sheet were adopted, on the motion of Mr. John Lee Warner. Sir Peter Eade proposed the re-election of General Bulwer as President of the Society. Mr. Field seconded, and the motion was agreed to. The President having acknowledged the compliment, the other officers of the Society were re-elected, and Dr. Bensly, as hon. treasurer, and Mr. Bellingbrooke, as hon. secretary, replied. The Hon. Secretary announced that some few weeks ago a gentleman wrote to him that he had two fragments of brasses taken from Norwich churches, which he thought of placing in Strangers' hall. He replied that the owners of Strangers' hall were not receivers of stolen property from Norwich churches, but he thought it well to get the brasses for the Archaeological Society, in order that it might restore them to the churches from which they had been taken. They had been mounted, and were now to be handed over to the clergy of the two churches. The first was a brass in memory of John Castor, who sat as alderman for Norwich, who died January 3, 1493, and who was buried in St. Lawrence Church. There was no doubt that the brass came from that church. The other two portions of brasses received were scrolls from a big brass in St. John Maddermarket.—The President then, on behalf of the Society, handed the Castor brass to the Rev. C. B. P. Ramsay, as rector of St. Lawrence. The Rev. Dr. Astley read a paper entitled "Notes on the Iter of Antoninus, with special reference to Venta Icenorum and Sitomagus," in which he maintained that, according to the data of Antoninus' Itinerary and the Tabula Peutingeriana, Caister and Thorpe are the sites of Venta Icenorum and Sitomagus, in harmony with the views of the older antiquaries, as opposed to modern theory, founded principally by Dr. Reaven, which fixes Norwich and Dunwich as the sites. The members spent the afternoon in a tour of the district to the south-west of Norwich. Starting from the Guildhall at two o'clock, accompanied by the President, the party were driven in brakes by way of Ipswich-road to Swainsthorpe, where the first halt was called at "Hickling-lane," a green way bright with gorse and fresh foliage, which the members traversed as far as the arch which spans the railway, where a paper was read by Mr. J. C. Tingay on the claims for the road in question to be accounted part of the Icknield Way, the great road which in very early days traversed the land from Cornwall to the Norfolk coast. "Hickling-lane," called in earlier evidences Icklinge-lane, constitutes part of the boundary between the parishes of Dunston and Swainsthorpe, and thus was to be accounted older than the townships themselves. It was to be picked up again at Stoke Holy Cross, where, according to Blomefield, there was in 1306 a way called Ykeneldegate. As the way, though so near the Roman Camp at Caister, did not run anywhere near it, Mr. Tingay was compelled to believe that it was in its origin a pre-Roman way. The party then proceeded to Swainsthorpe Church, where Mr. Leonard Bellingbrooke (hon. secretary) read some brief notes. It appears that there were at one time two churches at Swainsthorpe, one of them dedicated to St. Mary, but only that named after St. Peter remains. It consists of nave, chancel, north aisle, round tower octagonal above, and south porch, the principal features of interest being the fine roof, ornamented with angels, and the brass to Gilbert Havers, a soldier of Elizabeth's days, who saw service in "Barwick," Scotland, Ireland, and the Netherlands, and died on May 5, 1628. Another monument remembers a civic worthy of Norwich. The font was said to be Norman, but was probably of later date. Swardeston Old Hall was the next stopping-place, a quaint Elizabethan house, built in the form of an "H." Viewed from the road, the main gateway, flanked with large brick piers, is the main feature, the house retiring somewhat behind the enclosure and to the left. Over the porch is the date of 1574, on a gable is that of 1669 in iron figures, and on that part of the house connecting the main buildings is that of 1738. The front porch shows some curious stone and iron ornament, while the

inner door, very massive, and bearing a huge antique knocker, is framed in a square head, with spandrels containing shields of arms. The picturesque appearance of the old mansion is enhanced by the corbie-stepped gables and the mullioned and transomed windows of brick, some of them stopped up and many of them with hood mouldings and pediments. After inspecting the barn, which stands almost in front of the house, the journey was resumed to Swardeston Church. If, as was suggested, Swainsthorpe Church had suffered from over-restoration, Swardeston Church looked as if it had been untouched, save in the matter of the provision of certain rude furniture, since the Reformation period. It now sadly needs restoration. The church is lighted with a series of two-light decorated windows, and one of three lights in the chancel, a three-light affair on the south side of the nave being a later addition. The screen remains, and, so far as its tracery is concerned, appears to be in good repair, save for some strange and wonderful colour decoration effected about sixty years ago. The bottom part is close boarded up by the pews, and it is impossible to say whether or no the panels are intact. The tie-beam of the roof immediately above the screen retains some of its original drapery. Only one brass remains, an inscription bearing date 1550. The next call was at Intwood, a pretty little church, which has been so carefully restored that little or nothing was left for the students of the antique. Cringleford Church was the next and final stopping-place. The pretty and well-cared-for church is at the present time under repair, so far as its chancel is concerned, and the object of the visit was to inspect the discoveries made, and to hear something concerning them from the Vicar, the Rev. T. S. Cogswell. First dealing with the early Saxon church which originally occupied the site, Mr. Cogswell dealt at some length with "Cringleford Cross," which appears to have stood somewhere near the north churchyard gate, and parts of which had been built into the walls of the church. One of the pieces of the cross was built into the low side or lepers' window. This window, which was on the north side of the chancel, the Vicar believed to have been used for purposes of confession. It was placed on the side where there were most people, the confession being public as to view, though private as to hearing. In support of his contention, Mr. Cogswell quoted an enactment ordering the bricking-up of the places where the Friars had heard confessions. After a tour of the building and the inspection of the carefully-preserved remains, a move was made for Norwich.—*Norfolk Chronicle.*

Correspondence.

"THE VOICE OF THE ASSOCIATE."

SIR,—May I, in answer to "Associate," say a few words on the subject he has under review?

Firstly, then, the subject is no new one, for it has exercised the minds of, I suppose, every member of every Council of the Institute of Architects for the last ten years at least; but to set a standard and maintain it, up to which each candidate for the Fellowship must come, is not such an easy matter as "Associate" seems to think.

"Associate" and his friends—as far as one can judge—wish that Fellows should only be drawn from the ranks of the Associates, and just when it has been decided that after a given date this shall be so, he and they proceed to try and bring this change into operation before the appointed time. Surely this is not common justice to the candidates, nor does it reflect credit on the Associates who advocate such an unbusinesslike proceeding.

Even granted, however, that what "Associate" desires is the right course to adopt, does it take us much farther on our road towards raising the general standard of the Fellowship? I fear not; for as it has been found hard to set and maintain a standard for Fellows, so it has been found hard to maintain one for the Associates—in The Examinations; and much chaff has, I fear, slipped through with the corn during the process of winnowing. The machine is well designed, I am told by experts, but in the handling has to be worked gingerly, otherwise it might have little or nothing to test its

dexterity upon. Besides, the fact of having passed the Institute Examinations with flying colours, even as a student, does not go for much when the question really is—has this candidate shown by his executed works that he is an architect of sufficient merit and standing to entitle him to be elected as a Fellow? If the Associates would strengthen the hands of the Council a little in this direction I know of more than one member who would welcome the movement.

It may be a very desirable thing that every candidate should have passed the Examinations, but a more important thing is that they should all be honest men and good architects, and there must be many answering to this description who, for one reason or another, never presented themselves for examination in their student days. Why does "Associate" wish to keep these gentlemen out of the Institute altogether, when it is obviously to the good of all parties that they should join us? If "Associate" directs his energies against really unsuitable candidates he will have many with him, but I trust he will hesitate before attempting to press further a test which, to say the least of it, is for the present illegal, whatever else it may be.

LEONARD STOKES.

CONCRETE PUGGING FOR FLOORS.

SIR,—We must own that we are somewhat surprised and disappointed that the question of pugging between fir joists has not been more in the minds of architects and builders than the replies to our letter would seem to indicate.

Three gentlemen, all district surveyors, have given their opinion, but their letters scarcely deal with the point we raised. We had hoped to have received some enlightenment as to whether we were in error in our contention—that the risk of dry rot was considerably less if the pugging between the joists was in dry slabs of some fireproof material, rather than the mass of wet concrete that the suggested clauses of the new Amendment Act would seem to prescribe, and we should greatly have liked to have heard whether any architect or builder had any experience as to any untoward result through the use of wet concrete in floors.

The question is not confined to this one consideration—whether one system of pugging against another would stand for a little longer time in the lethal chamber referred to by Mr. Ellis Marsland; for if in the dry slab system it can be asserted that a much less risk of dry rot is incurred, it should, we think, recommend itself to those in charge of the present Bill, and should certainly be allowed therein.

Now, what is a fire-resisting floor, and what is it intended to do? Certainly it does not pretend to be a "fireproof" floor in the same sense as one of steel and concrete construction; it is, we take it, one of sufficient resistance to damp down a fire for a certain limited period of time, and to prevent the passing of vapour and smoke to the rooms above, so that the occupants may have time to receive warning and to make good their escape from the building.

The question to our minds is, therefore—is there less risk in using dry slab concrete than putting in 5 in. of wet material between the joists? We certainly think so, and if such is the case it should undoubtedly be permitted in the proposed Amendment Act.

Cast slabs have great advantages; they can be trimmed to position, and can be bedded and jointed with facility in plaster of Paris or cement. Wet concrete is an objectionable job; there is the slop and drip, the temporary boarding between the joists, the great quantity of water to be absorbed by the timbers, which must first swell and then shrink, and a far greater risk from rot, from the damp left in the floor when ceiled and covered in. Who can be sure that the timber when incorporated in a building is seasoned sufficiently and is free from the spores, whereby damp and the confined air will bring about the growth of the fungus so much dreaded in a building?

In conclusion, we would beg permission to make a few remarks upon the criticisms of our method. Mr. Marsland tells us that the nails securing the L irons to the sides of the joists are not sufficiently protected, and imagines the slabs of concrete falling upon the heads of the firemen entering the building; but we would reply that the 1½-in. clout nails we have used are very different to the brads that would secure an inch fillet to the sides of the joists, and are equally protected by the sides of the concrete slab protected by the direct action of fire. We think if against the direct action of fire. We think if floors treated with wet pugging be examined it will be found that in many cases the joists had shrunk, and there is an interstice left for flame to attack the fillet recommended by your correspondent.

We also question the wisdom of the advice—

that the pugging should be kept down to the underside of the joists, that is if the soffit is to be ceiled, for there would be no space left for the proper keying of the plaster. At the back of the lathing, whether the latter be metal or wood, and we should expect a ceiling so applied to fail.

Mr. Payne tells you that he wishes to cast the slabs with a groove in the side and to slide them on the 1-in. fillets nailed to the joists, and it is true that we did not see our way to attempt this mode of construction, for it appeared to us utterly impracticable; but even assuming that this could have been done, there would have been necessity to be so much play in the fitting of the slabs that there would most certainly have been a space on the underside between joists and slabs which would have enabled flame in case of fire to attack the fillets on which they were placed.

We do hope the Amendment Act relating to this question, as drawn, will be modified, and that district surveyors may have some discretionary powers, with the provision that in the event of disagreement the Tribunal of Appeal shall have power to settle the point.

HOLMAN & GOODRIAM.

RADIATION AND CONVECTION.

SIR,—Your remarks concerning radiator design in your issue of the 3rd inst. practically go to the root of the question of their value as "radiators" or convectors, apart from the dissent you have so cursorily expressed to my opinions of their usefulness in the form of radiators. I understand you hold it necessary that the surfaces must not be grouped closely, "but separated sufficiently to permit most of the heat rays to escape freely," for which purpose, as you remark, "the radiators must be of moderate depth." Not if you take a good-sized hospital ward, such, for instance, as any of those in the institutions under the Metropolitan Asylums Board, and allow ventilation to the extent necessary for fever cases, say, you will find that you must use radiators of considerable depth. I have an instance before me in which it would be necessary, were open fireplaces not used to supplement the radiators, to allow more than one radiator per bed, a radiator under every window in the ward and in the corners into the bargain, and then they would have to be of the "four column" type. This instance I could easily extend to scores of others, for it is the rule, and not the exception, in hospitals of any size worth speaking of, and in such cases what becomes of even twenty-five per cent. of the "radiation," even assuming that there is any radiation of practical value from radiators of "moderate depth"? It must be realised that when the heating is dependent upon "radiators" alone the surface has to be large in order to meet hard weather, hence the number of radiators necessary and the size and shape of the same.

I have further met many such cases where the radiators are closely cased in, so that any theoretical radiation is then, I think you will agree, actually put out of the question. In fact, you no doubt are aware that this is a common practice, and I would ask you to consider such a case in the light of my letter addressed to your notice.

T. J. CODD.

YORK MINSTER.

SIR,—Your Note as to the proposed alterations at York Minster leaves the impression that the flying buttresses on the south side of the nave are in existence. This is not however the case. The pinnacles on the buttresses of the south aisle have been carried up, but the flying buttresses themselves were either never built or have been destroyed. On the north side the buttresses stop at the level of the aisle parapet, and there are no pinnacles. Apart from the architectural ethics of the case it may be argued that to some the unbroken masses and deeply-set windows of the north side are even more impressive than the elaborate detail of the south. If it were proposed to vault the nave, as you say, the game might be worth the candle. Is it not the case that the present wood and plaster vault was rebuilt after a fire in the last century?

CHARLES A. NICHOLSON.

* * Not the whole roof, we believe. The fire must have been mainly towards the centre of the building, as the organ was destroyed; a fact of which we possess a memorial in the shape of two old picture-frames made from unburned fragments of the organ-case.—Ed.

BUILDING TRADES EXHIBITION.

SIR,—As I am receiving letters asking whether I have any connexion with a "Scottish" Building Trades Exhibition, which is being undertaken owing to "the disappointment given by the increasing success of the London enterprise," would you kindly allow me to state that I have no connexion whatever with this venture, nor has any of my staff.

H. GREVILLE MONTGOMERY.

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE-STEEL.—XXIV.

NEW POPULAR THEATRE, MUNICH.—NEW CONCERT HALL, STRASBOURG.

WE give this week some particular relative to a class of building which has not been considered in previous articles of the present series, and, for the purpose of avoiding repetition, attention is directed principally to the more noteworthy features of the buildings in question.

New Popular Theatre, Munich.—Upon the site of the former building in the Hospital-St. Josephs-strasse, Munich, a new theatre has been erected from the designs and under the direction of the architect, M. Charles Titrich. The old theatre was condemned on account of the serious risks to which audiences were exposed by inadequate protection against fire, and by insufficiency of the corridors and exits for clearing the house.

With the object of establishing desirable conditions of safety, the front portion of the building was separated from the houses on either side. A narrow façade on the street gives access to the vestibule and box office, while the auditorium and the stage are situated in the space behind.

For reasons connected with the position and construction of the adjoining property, it was not possible to carry the theatre to any great height. The auditorium contains merely a parterre and two balconies. As the parterre is nearly at the same level as the courtyard outside, provision was easily made for the rapid emptying of the houses by means of exit corridors through the houses on either side. Similarly, the stage is very little higher than the lower end of the auditorium floor, which, as usual, slopes down towards the orchestra.

In order to increase the seating accommodation as much as possible, the two balconies were made of considerable width, and, so that no obstruction should be caused to the view of those occupying seats below, the balconies were designed on the cantilever principle, without any support along the outer edge.

For the realisation of this bold scheme, the architect had recourse to concrete-steel construction, which enabled him to utilise to the utmost the limited height of the auditorium, to provide for the support of maximum loads, and to safeguard the building from the risk of fire.

Fig. 159 is a horizontal section, which shows the general arrangement of the auditorium and the crescent-shaped balconies. The chief support of the first balcony is afforded by a beam 12·20 metres long, supported by the division walls of the parterre. The upper balcony is carried by two pairs of beams, 11 metres and 7 metres long respectively, placed diagonally, and between them, parallel with the axis of the building, by two beams 9 metres long and one beam perpendicular to the same axis, as shown in Fig. 159. These six beams are connected by other members to form a horizontal framework for the support of the balcony.

It should here be observed that the beams are of very shallow depth, this being necessitated by the limited headroom between the different floors. Thus, in view of the fact that the span of the beam carrying the first balcony is 12·20 metres, the depth of this member should have been fully 1 metre, but, in order to avoid interference with the view of those who occupy standing-room at this part of the theatre, the depth was limited to 40 centimetres. This naturally involved the employment of a much larger proportion of steel in the concrete than is usual. To suit the conformation of the balcony, the beam in question has the form of a ship's keel turned upside down. The beams supporting the upper balcony were designed under somewhat more favourable conditions. Still, it was necessary to reduce their depth below that which is usual for the spans involved.

Notwithstanding the minimum dimensions adopted, the construction gave extremely satisfactory results when tested in the presence of the municipal authorities. After the lower balcony had been subjected to a load of 800 kilogrammes per square metre—double the calculated superload—the 12·20-metre beam exhibited a deflection of only 1·2 millimetres, or about $\frac{1}{1000}$ of the span. Similarly,

having been subjected to a double load for several days, the beams of the upper balcony showed no perceptible deformation. In the upper surface of the balcony floor slabs, strips of timber were introduced during the moulding of the concrete, to which the treads of the steps were afterwards nailed. The under surface of the balconies is provided with a false ceiling in staff for the double purpose of hiding the projecting ribs and of improving the acoustic properties of the theatre, the space

between the two surfaces being useful also for the extraction of vitiated air.

The disposition of the beams mentioned had the effect of concentrating weight at several points on the walls of the theatre. As the loads involved greater stresses than the walls were capable of taking with safety, and as the ventilating engineer required numerous openings and chases in the walls for ventilation ducts and heating pipes, the architect abandoned the idea of carrying the beam loads upon the walls.

As an alternative, he decided to employ columns of concrete-steel enclosed in the walls. Consequently, these walls were built in some places so as to be capable of supporting loads, and in others merely as curtain walls.

Of course, the columns were continued down into the basement of the building and supported on suitable foundations, which in this case consisted of concrete-steel footings designed in the manner we have described in several preceding articles. The concrete-steel columns

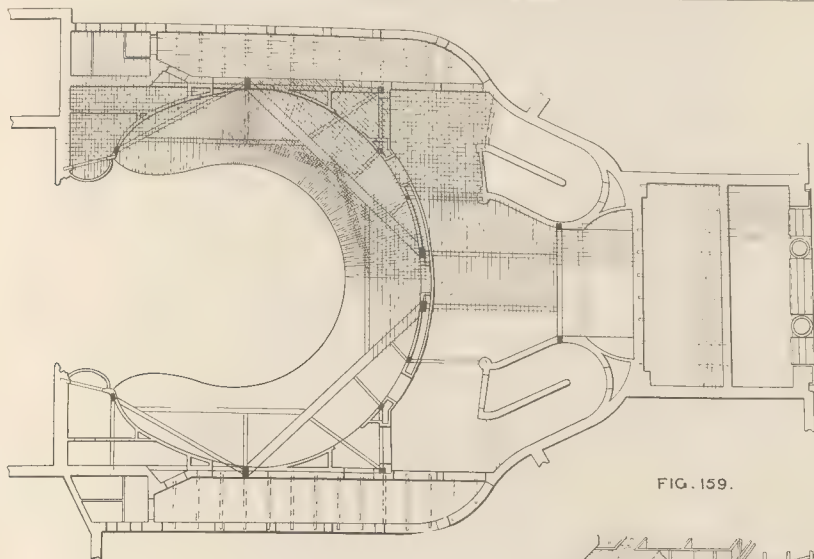


FIG. 159.

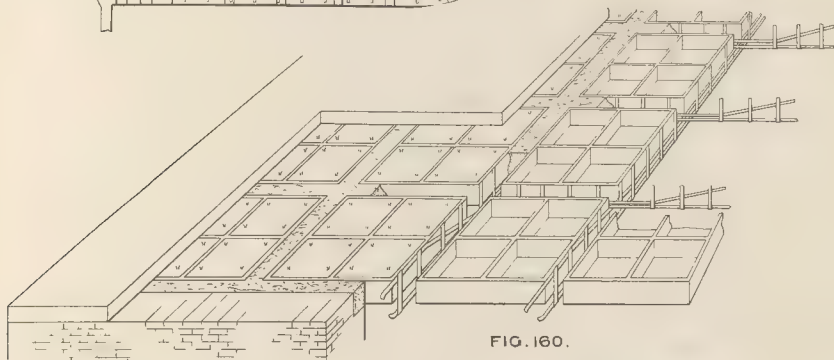


FIG. 160.

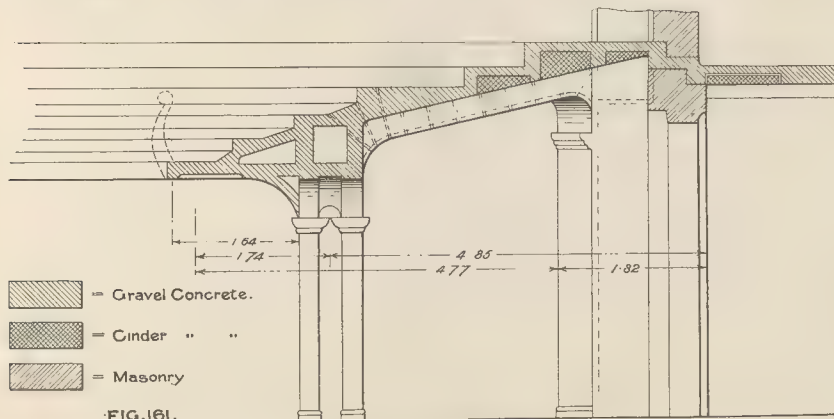
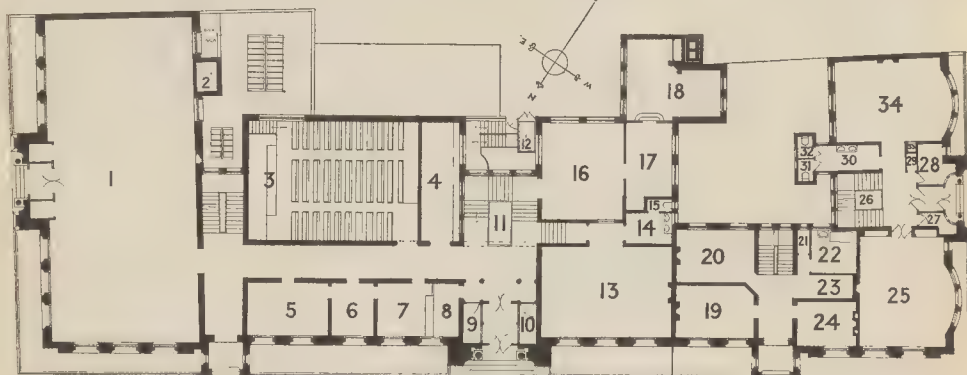


FIG. 161.

Illustrations to Student's Column.



University College Hospital Medical School and Nurses' Home. Plan.

are also utilised for supporting the floor of the parterre.

Outside the auditorium all the horizontal construction, and notably that of the ceilings, roofs, and terraces, is in concrete-steel.

One remarkable feature in connexion with this building was the short space of time occupied in erection. The foundations were commenced about May 15, 1903; the concrete-steel work was begun by June 10, and finished about September 15 of the same year. The contractors for the concrete-steel work were MM. Tank frères, concessionaires under the Hennebique patents.

Concert Hall, Strasbourg.—This is a very fine building, in which the floors and walls are of concrete-steel, designed in accordance with the Hennebique system. In addition to the grand concert hall, this structure contains a café, a restaurant, and a club.

The building covers a triangular site with an area of nearly 1,700 square metres. The concert hall proper is bounded on one side by the outer wall of the building and on the three other sides by the accessory departments mentioned above. The two principal façades of the building are on Phalsbourg-strasse and Juliens-strasse, the angle at the junction of these two streets being occupied by a polygonal tower. The main entrance is in Juliens-strasse, and comprises three large bays giving access to a spacious vestibule where the booking and pay offices are situated, and thence to a hall providing accommodation for cloakrooms and extending over the whole area beneath the concert hall. A garden where concerts are given is in communication with the ground floor of the building. At the end of the lower hall are the kitchens and other domestic offices of the café and restaurant, the latter establishments facing the Phalsbourg-strasse. The kitchens also provide for the requirements of a large restaurant-buffet on the first floor.

On the same floor is the grand foyer, 17.50 metres by 7.80 metres, adjoining which is a small foyer to the right. The grand concert hall comprises a nave 13 metres high and measuring 32.50 metres by 19.85 metres, exclusive of the stage, and two aisles, each 18.40 metres long by 3.40 metres wide, forming galleries along each side of the hall. The springings of the arched clearstory on which the roof is built are supported by groups of columns. The aisles are divided in their height by a floor which is extended by a balcony projecting 2 metres into the main hall. The concert hall contains accommodation for nearly 2,000 persons, and the stage has a width of 12.60 metres and a depth of 9 metres, including the proscenium.

On the second floor, which is at the level of the galleries at either side of the concert hall, are the apartments occupied by a club and the offices of the manager. The two galleries are connected by a balcony at one end of the hall, affording additional space for the audience.

Four wide flights of stairs lead from the cloak-room to the concert hall, and four other staircases rise to the floor on which the galleries are situated, thus providing ample means for the rapid emptying of the entire building.

The greatest difficulty presented to the architect in the realisation of the general plan was that the main and partition walls of the upper stories were necessarily situated so that no support was given by similar members on the stories below. Therefore it became necessary to design each floor as a huge platform capable of supporting the wall and partition loads of the floors above. The architect decided that concrete-steel construction would lend itself better than any other system to the solution of the problem, thanks to the continuity and monolithic character of all its constituents, thereby permitting the distribution of all loads over the whole horizontal section of the supporting walls.

The floors were calculated for a superload of 400 kilogrammes per square metre. Selected parts of the construction of different spans were tested on completion of the work by loads varying from 400 to 500 kilogrammes per square metre, with the result that the deflection was found to be very small and nowhere reached the amount of 2 millimetres.

Fig. 160 shows the construction of the floor, in hollow panels on the Zublin system, which constitutes the ceiling of the foyer, and is prolonged to form one of the balconies on the façade. Fig. 161 is a section showing the construction of the galleries in the concert hall.

It is a matter for some surprise in the present day, when it is becoming recognised that concrete-steel can be most readily adopted to meet the most complex conditions, that the pioneers of this system of construction should have experienced such difficulty in securing its full recognition in architectural design. At the outset concrete-steel was only applied to parts of buildings where no other material could be used with equal advantage, and even then designers appeared to think that its presence must necessarily be hidden by false ceilings and other casings in forms with which the eye had long been familiar.

This mistaken notion, entirely at variance with true æsthetic principles, is being gradually broken down, and architects are beginning to realise that concrete-steel members need no longer be hidden providing their exterior surfaces receive appropriate decorative treatment.

Thus, in the concert hall of Strasbourg the beams which constitute the ribs of the floors are plainly revealed and form ribbed ceilings of entirely satisfactory appearance. Similarly the galleries projecting boldly from their supports are sustained simply by light and graceful cantilevers, the form of which is not disguised in any way. The remarkable lightness of construction characterising the hall testifies alike to the correct principles followed by the architect and to the extreme adaptability possessed by concrete-steel.

BISHOP CREIGHTON MEMORIAL, ST. PAUL'S.—As part of the memorial to the late Bishop Creighton a bronze statue of the deceased prelate, sculptured by Mr. Hamo Thornycroft, R.A., will shortly be unveiled in St. Paul's.

Illustrations.

MONUMENT TO THE MARCHIONESS OF LOTHIAN, BLICKLING.



HIS monument, of which a plaster model is in the Lecture-Room at the Royal Academy, was commissioned by the Earl and Countess of Brownlow to be placed in the church at Blickling, Norfolk, where the late Marchioness of Lothian had lived since her widowhood. In the background the sculptor has shown the steps and the terrace garden of Blickling Hall.

The monument is a bas-relief 6 ft. 8 in. long by 3 ft. 4 in. high, with a projection of 4 in.

Mr. A. G. Walker is the sculptor.

UNIVERSITY COLLEGE HOSPITAL MEDICINE SCHOOL AND NURSES' HOME.

THE Medical School and Nurses' Home of the University College Hospital, of which we give an illustration, is the outcome of a generous gift which Sir Donald Currie recently made for the purpose.

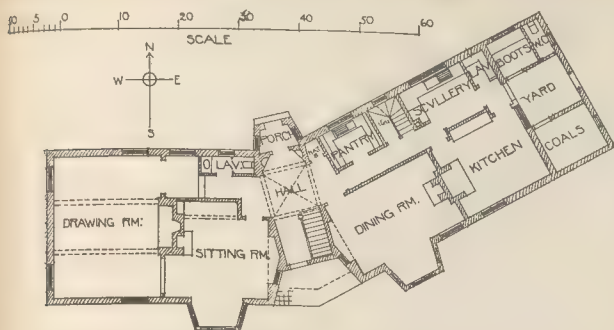
The Gower-street end of the building and most of the University-street frontage will be occupied by the school proper, which will consist of large laboratories, theatres, etc., as well as various students' club-rooms. The Huntley-street end is devoted to the nurses' home (in which there will be accommodation for seventy-four nurses), and between the school and nurses' home there is a house for eight students engaged in obstetric work. The principal elevations are intended to be in Portland stone and red brick. Mr. Paul Waterhouse is the architect.

The plan is subjoined, and the following are the references to the numbers on it:—

Medical School. Students' House. Nurses' Home.

- | | | |
|-----------------------------|--------------------------|-----------------------------|
| 1. Library | 19. General sitting room | 25. Sitting room |
| 2. L.R. | 20. General dining room | 26. Passenger lift |
| 3. Theatre | 21. W.C. | 27. Porter |
| 4. Students' lockers | 22. Bath, etc. | 28. Office |
| 5. Dean's office | 23. Cycles | 29. Telephone |
| 6. Secretary's office | 24. Private sitting room | 30. Cloak room and lavatory |
| 7. Clerk's office | 31. W.C. | |
| 8. Waiting room | 32. W.C. | |
| 9. Telephone | 33. Food lift | |
| 10. Porter | 34. Dining room | |
| 11. Passenger lift | | |
| 12. Coal lift | | |
| 13. Board room | | |
| 14. Cloak room and lavatory | | |
| 15. W.C. | | |
| 16. Games and papers | | |
| 17. Reading room | | |
| 18. Writing room | | |

* For students.



House at Chislehurst. Plan.

HOUSES AT CHISLEHURST AND CAMBRIDGE.

The house at Chislehurst was built by Messrs. Podger & Sons, of Bromley; that at Great Shelford, Cambridge, was built by Mr. F. Johnson, of Chelmsford.

The architects were Mr. W. Curtis Green and Mr. Arch. C. Dickie. The illustrations are from photographs of the houses as completed.

CASKET PRESENTED TO H.M. THE KING OF SPAIN.

This casket was made by Messrs. Elkington & Co. from a design of Miss Florence Steele, for presentation to the King of Spain on the part of Spanish residents in the United Kingdom.

It is executed in silver, the sides divided into panels containing decorative figures representing different virtues. The base was altered from the original design in order to gain a space on which to display the arms of Spain; an addition perhaps necessary under the circumstances, but which is rather an excrescence on the design.

The casket was presented to the King, with an illuminated address, on the 6th inst.

FOUNTAIN IN BRONZE AND MARBLE.

This is a design for a fountain which has been carried out in bronze and Cipolino marble for interior use, and in bronze and Portland stone for exterior. It is shown here as placed in a garden, but there is a replica of it, or part of it, in the Lecture-Room at the Royal Academy. The height is about 4 ft. 2 in. from the ground line, and the width of the lower basin about 4 ft. 6 in.

Mr. F. Lynn Jenkins is the sculptor.

DESIGN FOR AN ORGAN-CASE.—We have a photograph of an executed organ-case which has too often happens with illustrations sent here) has no title or name, or any means of identifying it, except that it bears the imprint of a Leeds photographer. If the architect who sent it sees this, will he kindly communicate with us.

THE CONSISTORY COURT, LONDON DIOCESE.—On May 26 Dr. Tristram, K.C., Chancellor of the Diocese, consented to the issue of two faculties for the Court. One faculty related to a petition for the removal of the two galleries at the west end of the Church of St. Mark, Notting Hill, in order to obtain more light from the windows at that end, and better ventilation, with improved means of entrance to and exit from the church, whilst leaving 800 sittings on the ground floor; the church was built in 1862-3, after designs by E. B. Keeling. The other faculty granted a petition preferred by the vicar and churchwardens of Christ Church, Baling, conjointly with the mayor, aldermen, and burgesses of the borough, for powers to convey to the Town Council, as the urban authority, a parcel of unincorporated land, about 140 sq. yds. in extent, and forming portion of land originally acquired for the erection of the church, for the purpose of widening Springbridge-road. It was stated in court that the incumbent intended to devote the purchase-money, 3500s., towards certain alterations and improvements of the church for which a faculty was obtained some months ago. Christ Church was built in 1851-2, after plans and designs by Sir G. G. Scott.

ENGINEERING SOCIETIES.

THE JUNIOR INSTITUTION OF ENGINEERS.—The summer meeting of the Junior Institution of Engineers is this year to be of a special character, in celebration of the Society's coming of age. It is to be held earlier than usual, so as to include Foundation Day (June 30), and will open on Monday morning, June 26, when the Lord Mayor and the Sheriffs will receive the members in the Council Chamber of the Guildhall of the Corporation of the City of London. The proceedings will include the reception of representatives of kindred associations; the presentation of a historical note by Mr. W. J. Tennant, past chairman; a short address by the President, Mr. W. H. Lindley, of Frankfort-on-Maine; and votes of thanks, after which an adjournment will be made for luncheon. In the afternoon there will be a special visit of inspection of St. Paul's Cathedral, under the guidance of the Archdeacon of London and the Consulting Architect, Mr. Somers Clarke, followed by a choral service with appropriate anthem, by permission of the Dean and Chapter. The members are afterwards to be received by the Lord Mayor and Lady Mayoress at the Mansion House. On Tuesday both the morning and afternoon will be devoted to visiting Woolwich Arsenal, under arrangements specially made by Mr. H. F. Donaldson, Chief Superintendent of Ordnance Factories. In the evening a reception will be given by the Institution at the Royal United Service Institution, Whitehall. The museum will be open, a regimental band will perform, vocal selections will be rendered, and short illustrated lectures by Professor Lambert and Mr. J. P. Maginnis are announced in the programme. For Wednesday visits have been arranged to the Royal Mint, Messrs. Yarrow's works, Poplar; the North London Railway works, Bow; and the Greenwich generating station of the London County Council tramways (where the engines are in course of

erection) and to the New Cross depot. On the following day an excursion to Chatham will take place, for which the *Clacton Belle* has been chartered to leave London Bridge at ten o'clock. On arrival at Chatham the dockyard will be visited, and the return to London will be via the Nore. Friday morning will be occupied with visits to Messrs. Doulton's potteries and to the Nessenden power house of the Metropolitan Railway. In the afternoon and evening the members and their friends will meet at Earl's Court for an inspection of the Naval, Shipping, and Fisheries Exhibition, concluding with a dinner.

COMPETITIONS.

WESLEYAN CHURCH HOUSE.—On the advice of Sir Aston Webb, the trustees of the new Wesleyan Church House at Westminster have accepted the plans for the Connexional buildings prepared by Messrs. Lanchester & Rickards, of Vernon-place, Bloomsbury-square, W.C. It is thought that the cost of the building will amount to 140,000.

THE HIGH WINCOBANK HOUSING SCHEME, SHEFFIELD.—At a meeting of the Housing Sub-Committee of the Sheffield City Council, Mr. E. M. Gibbs submitted his report and award with reference to a competition amongst local architects for plans for the erection of twenty dwelling-houses on the Corporation's estate at High WincoBank. It was a condition of the competition that the houses could be let at 5s. per week, without involving any charge on the rates, and each set of designs had to be accompanied by a builder's tender. Mr. Gibbs awarded the first premium to design No. 5, by Mr. H. L. Paterson, and the second to design No. 16, by Mr. W. Spencer Smith. Twenty designs were submitted for competition.

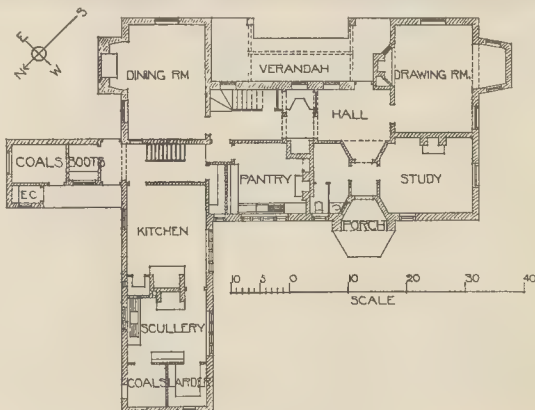
BOOKS RECEIVED.

EARTH AND ROCK EXCAVATION. By Charles Prelini, C.E. (Crosby Lockwood & Son. 16s.) ROOFS AND FLOORS OF NEW BUILDINGS. By Ernest H. Essex, A.M.Inst.C.E. (The St. Bride's Press. 2s. 6d.)

OBITUARY.

MR. A. JACKSON.—The remains of the late Mr. Arthur Jackson, builder and contractor, were buried on Saturday at Ambleside. Mr. Jackson was vicar's warden, and had sat for Ambleside on the Urban Council, Board of Guardians, and other local bodies.

BUILDING BY-LAWS, DARLINGTON.—At a recent meeting of Darlington Town Council, Alderman Widdowfield, in moving the adoption of the Streets Committee minutes, which included the approval of plans for a large number of new houses, said the new by-laws for new buildings and streets had been confirmed by the Local Government Board. He took that opportunity to let all who were concerned in this matter know that, henceforward, they intended to strictly carry out those by-laws.



House at Great Shelford. Plan.

GENERAL BUILDING NEWS.

CHURCH, BURTON.—The Bishop of Lichfield recently consecrated the newly-erected church of All Saints, Burton-on-Trent. The cost of the edifice is 30,000. The plan includes a nave, with north and south aisles, and a narthex at the west end, with a porch on the south side and an entrance under the tower on the north. The roofs are mainly of oak, and the materials used for the exterior are Cobbe and Weldon stone, while the internal dressings are of red Hollington. The style is late Decorated, treated somewhat freely. The east window is emblematical of all the saints. The fittings are all of oak fumed to a dark colour, and the seating accommodation is for 800 persons. The architects of the new church were Messrs. Naylor & Sale, of Derby, and the contractors were Messrs. Thomas Lowe & Sons, of Burton.

CHURCH, FISHPONDS, BARNOR.—The Lord Bishop of Bristol dedicated the Church of All Saints, Grove-park, Fishponds, on the 26th ult. The church is in the XIVth century style, and the site was presented by Miss Castle, of Stapleton. The eastern portion has been completed, and comprises a chancel and a morning chapel, which are separated by a couple of arches and the nave and aisles. Two vestries are placed on the north side of the chancel, the choir vestry walls being carried up to form an organ-loft, while below is a heating-chamber. The building is executed in rock-faced Pennant stone masonry, laid in level courses, with Bath stone dressings, the walls being lined internally with adamant. A feature in the chancel is the terrazzo and marble mosaic floor, the nave and aisles being paved with wood blocks, and pitch-pine under the seats. The windows are three-light ones, with flowing tracery, except the eastern one, which has five large lights. A series of gabled roofs have been adopted for the aisles. All the windows, both externally and internally, have Bath stone shafts, with carved capitals. The roofs are of open timber work, boarded and felted over, and covered with red and brown Broseley tiles. Messrs. Clark & Sons, of Fishponds, have been the contractors for the general work. The heating and ventilating are by Messrs. Dark Brothers, of Bristol. The work has been carried out from the plans and under the superintendence of Messrs. Lingen Barker & Son, Bristol.

CHURCH EXTENSION, WILLESSEN.—On the 27th ult. the Bishop of London consecrated the new chapel of St. Michael and All Angels' Church, Stonebridge, Willesden. The church is of Early English design, built from the designs of Mr. C. E. Child.

ROMAN CATHOLIC CHURCH, SUNBORO, CO. KILDARE.—The foundation-stone was laid a short time ago of a new Roman Catholic church at Sunboro, Co. Kildare. The architects are Messrs. W. H. Byrne & Son, Dublin, and the contractor Mr. Patrick Nolan, Monaghan.

PARISH CHURCH, SLEEKBURN, NORTHERMBERLAND.—The foundation-stone of a new church was laid on the 6th inst. at Sleekburn. The designs for the work have been prepared by Mr. A. B. Plummer, architect, of Newcastle, and the cost will be about 4,200. The contract has been placed in the hands of Messrs. J. Goulding & Son, of Blyth.

CHURCH, LUPPETT, DEVON.—The parish church was struck by lightning on March 15 last, and damage caused to the extent of about 200. The flagstaff attached to the parapet of the staircase turret, which is at the S.E. angle of the tower, was splintered, there being no lightning conductor, and the top of the turret wrecked, a rent being made in its south wall for some 13 ft. down from the coping. The falling masonry decapitated the S.E. gargoyle of the tower and injured, to some extent, the slated roof of the nave and south porch. A portion of the electric discharge, passing from south to north by means of the lead-covered roof of the tower, found its way to earth by the iron rainwater pipe which it shattered in its course. The height of the parapet of the tower from the ground is about 57 ft., the turret being about 34 ft. higher. The injuries have been repaired, and a lightning conductor added, by Messrs. G. L. Stile & Son, builders, of Exeter, under the direction of Mr. J. Houghton Spencer, architect, of Taunton.

WESLEYAN CHURCH, EXETER.—A new Wesleyan Methodist church has been erected at Exelby, near Exeter. The new church is in the Gothic style, built of red brick, with stone facings. From the front projects a vestibule and the central doorway, above which is a large decorated window in four lights, while further light is provided by windows at each side of the vestibule. The rostrum is of pitch-pine, and the pews, roof supports, and other internal fittings are of the same material, while the aisles are laid with pine blocks. There is sitting accommodation for about 120 persons. At the rear of the chapel, and uniform with it, is the Sunday-school, which

will accommodate some sixty scholars. The heating of the building is on the hot-water system. Mr. Dougill, of Aysgarth, was the architect, and Mr. T. Bulmer, of Bedale, the contractor. The sub-contractors were Mr. A. Aquith, of Bedale, for the joinery work; Mr. Pape, of Leeds, for the glazing; and Mr. W. Pearson, of Bedale, for the plumbing.

CORPORATION DEPOT AND STABLES, BIRENHEAD.—On the 25th ult. the new Corporation depot and stables in Cleveland-street, Birkenhead, was opened. Hitherto the cleansing of the stables has been entrusted to contractors, but in future the Corporation will employ its own men in this work, and the team labour required will be provided from the municipal stables. The buildings are situated between Cleveland-street and Corporation-road on the west side of Victoria-street, and occupy about 2½ acres. They comprise eight separate blocks, the administrative block being on the right of the main entrance in Cleveland-street. Embraced in the workshop buildings are store-sheds; painters', joiners', and wheelwrights' shops; smithy, shoeing forge, steam-roller shed, etc. The stables are in two blocks of similar design, each containing three twelve-stall stables with a cart-shed at the end. The vendor store is situated near to the stables, equipped with complete plant for the crushing and mixing of provender, the motive power for which is supplied by an electric motor. Mr. C. Brownridge is the Borough Surveyor, and the work has been carried out from his designs.

SCHOOL, ABERDEEN.—A school is being erected in Aberdeen, on the site of the old St. Clement-street school. The new structure is what is known as a one-class-per-standard school, with places for 600 pupils—195 places for infants, and 405 places for junior and senior scholars. The principal front of the building, as in the former school, faces St. Clement-street, and is about 120 ft. long, and the frontage to Church-street is about 70 ft. long. The classrooms are arranged round a central hall, which is 37 ft. 6 in. square, and a corridor, 12 ft. wide, runs northwards from this hall for a distance of 58 ft. The infants' rooms, three in number, are arranged along the east side of the hall, the entrance being from the back playground. Alongside the front entrance from St. Clement-street is the infants' mistress room, while the headmaster's room is nearer the boys' entrance, which adjoins the playground facing Church-street. In addition to the three classroom for infants, there are provided, on the ground floor, the classrooms for the two lowest classes, together with cloakroom accommodation. Separate stairs, for boys and girls respectively, lead to the first floor, on which there are five classrooms, and in addition, a cookery-room, wash scullery, a music room, and a wood store, a library, in which a large and suitable collection of books for the young will be stored; and teachers' accommodation, with additional stores, etc. The central hall is carried up through both stories of the building, and is lit from the roof, while a gallery is carried all round the first floor, along the staircases, including both steps and landings, will be of granolithic, and will be fireproof. The internal woodwork will be of yellow pine, stained and varnished; and the central hall, corridors, and staircases will have glazed tile dados, 4 ft. in height. The school will be built of hammer-blocked and sneaked ashlar, with picked dressings. The total cost of the new school, including the heating, ventilating, and furnishings, will be about 7,500. The architect is Mr. J. A. O. Allan, the School Board's architect. The contractors are:—Mason work, Mr. George Hall; carpenter work, Messrs. Leslie & Hay; slater work, Messrs. William Coutts & Son; plaster work, Mr. Alexander Stephen; plumber work, Mr. James Worling; painter and glazier work, Messrs. Gordon & Watt; steel and iron work, Messrs. James Abernethy & Co.; steam boiler for heating, Mr. George Sinclair, Leith; and granolithic stairs, Messrs. James Bannock & Sons.

ST. EDMUND'S COLLEGE, WARE.—On the 24th ult. the new Divines' Wing was opened at St. Edmund's College, Old Hall, Ware. The Divines' Wing is situated on the south side of the college. It is entered by a porch on the east side, which, with the facade, is executed in red rubbed bricks, and Bath stone dressings. The porch is a pediment, on which are carved the college arms, and over the front door is another pediment adorned with Catholic emblems. On one side of the large entrance hall are the lecture-rooms for philosophy and theology, and on the other side the students' common-room and library. Beyond these rooms is the ambulatory, which is connected with the south cloister and leads to the oratory, which will be known as the "Chapel of St. Francis of Sales." The altar in the oratory is composed of alabaster and antique green marble, with panels of

red marble, and the altar-piece consists of three paintings on copper set in carved wooden panels adorned with 2,000 gold leaves. The central painting represents St. Francis of Sales, the patron saint of Archbishop Bourne, and the other two are portraits of St. Edmund and St. John. On the altar is a brass embossed tabernacle, bearing upon its doors the favourite motto of St. Francis, "Vivat Jesus"; and this is surmounted by a crucifix and other altar ornaments. The lengthy south cloister is joined at right angles by the west cloister, which communicates with the refectory and the library, the only two portions of the old building, with the exception of the church, that will be used by the divines. There is a lift from the ground floor to the three upper stories, where are the professors' and students' rooms, accommodation having been provided for fifty divines. The day school system of heating and ventilation has been adopted. The new building is lighted with acetylene gas. On the north side of the college a new chapel has been built to receive the shrine and relic of St. Edmund. It is in the Gothic style, and harmonises with the Collegiate Church of St. Edmund, designed by Henry Aston Webb. A new chapel or sacristy. The altar was given by Bishop Patterson when president of the college. The stone reredos is the gift of the Edmundian Association. In the centre niche is a figure of St. Edmund, and on either side an angel carrying his arms of Abingdon and the Sea of Canby, which are shown bearing emblems of his life. The stained-glass windows in the sanctuary have been taken from the lady chapel. The total cost of the new buildings, including furnishing, is 17,000. The new wing and chapel have been designed as an extension of the college by Mr. F. J. Walters, F.S.A., of Westminster. The builders were Messrs. Atkins & Co., of Hertford.—*Hertfordshire Mercury.*

WESLEYAN SUNDAY SCHOOL, HALIFAX.—A new Wesleyan Sunday school has recently been opened at Halifax. Mr. Dalzell, architect, of Halifax, prepared the designs for the work.

COUNCIL SCHOOL, SPRINGWELL, LEICESTER.—A new day school which the Durham County Council have erected at Springwell was opened a short time ago. It has been built from designs prepared by Mr. Wilkinson, architect, Chester-le-Street. The building consists of one story, and is of stone. It has been planned on the central hall principle, with accommodation for 500 children, and has cost 8,000. The contractor was Mr. Brewis, builder, Wainthorpe.

PROPOSED WESLEYAN HALL, WHITLEY.—The designs for the new Wesleyan hall at Whitley, with schools and classrooms, have been prepared by Messrs. Cooper & Howell, architects, of Reading, and the tender of Mr. R. Curtis, Reading, for 4,342, has been accepted. The hall is to be built of red brick and stone, and will be constructed to seat 800 people. The contract for the heating and lighting has been secured by Messrs. Callas, Sons, & May, Ltd., Reading.

WORKMEN'S WELLINGS, ALDWICK.—At the ordinary monthly meeting of the Alnwick Urban Council—Councillor John Davison (Chairman) presiding—a report was received from Mr. J. Wightman Douglas, architect, stating that twenty flats of these new buildings were ready for occupation on May 12 last, and the whole of the work completed in the course of a fortnight. The west block, also numbering twenty-eight flats, he anticipated would be finished for September 30.

BUILDING IN EDINBURGH.—Mr. James Masie, Burgh Engineer and Master of Works for the city of Edinburgh, has issued his report on work done by his department during the year ended December 31, 1904. It states that the systematic overhauling and repairing of the old built sewers in the new town has proceeded almost uninterruptedly during the year. The total length of the sewers repaired is 1,860 yds., and the cost in wages and materials amounts to 1,495. In connexion with work sanctioned by the Dean of Guild Court, 5,576 visits have been made to inspect the drains and sanitary appliances. Notwithstanding the outcry about dullness of trade and want of employment among the working classes, the upward tendency in value of work presented for warrant to the Dean of Guild Court seems to show that much work was contemplated during the past year little has been realised. Both in the number of warrants granted and in the value of the work which these warrants represent are there considerable increases over the corresponding figures of the previous year, the totals being 868 warrants granted for the year 1904, against 803 for the year 1903, and the values of the work 394,940 and 325,584, for these years respectively. Judging from the figures relating to villas, self-contained houses, and tenements, it would appear that speculative building has suffered no check during the past year, as the estimated value of these classes of building for the year 1905, against 449,500 for the year 1904, is 568,900.

the year before. Whether the demand will equal the supply in this direction remains to be seen, the report states that the only works carried out in connexion with the housing of the working classes during the year had been the reconstruction of old tenements in Greenside. Of the 13,700 tenements for the building scheme in this district, 6,500, was allowed in the year's estimates for the rebuilding and remodelling of tenements in Greenside-row, three tenements in Queen's-place, and one in Gilchrist's-entry, embracing in all forty-eight houses of kitchen and bedroom, and thirty-five houses of single apartment. The estimated cost of rebuilding these five tenements was 9,950, and the estimates accepted for the works amount to 6,907. 10s. 5d. The rebuilding of the two tenements in Greenside-row was commenced in February, and the houses were ready for occupation in December. The second contract for reconstruction of tenements in Queen's-place was commenced in April, and the houses are about ready for occupation; and a third contract for reconstruction of tenements in Queen's-place and Gilchrist's-entry was commenced in December. The work still to be undertaken under the scheme as sanctioned by the Council, embraces the reconstruction of one tenement in Marshall's-court, the paving of the streets and courts, and the demolition of certain old properties incapable of renovation. The sum allowed for this work is 6,550; but since the adoption by the Council of the proposals contained in the report of September 14, 1900, other properties have been acquired, which will require to be dealt with in a manner similar to those now in hand, and for which no allowance has yet been made. Of the properties acquired in Cowgate and Robertson's-cloze, by private treaty, and comprising four tenements in Robertson's-cloze, one tenement in Cowgate, tenement, stables, etc., in South Aldry-street, three tenements and all the stables have been demolished, and the sites are at present open ground. Of the three tenements remaining, the two in Robertson's-cloze have been reconstructed. The work was sanctioned by the Council in May, at a probable cost of 1,050, and was commenced in June and completed at the end of December, for the sum of 997. To complete the improvement of this area, the remaining tenement in Cowgate would require to be taken down and set back to the line of the buildings adjacent, as the carriage-way of Cowgate at this point is only about 3 ft. wide, and the tenement and the one almost opposite to it form now the only obstructions to this thoroughfare, the street having been widened and improved at the east and west ends by the Improvement Scheme and Act of 1893. The clearing away of the old properties in Paul-street was completed at the end of the year. Gilchrist-street has been widened to 40 ft.

NEW LABORATORY AND CLASSROOMS, CONVENT OF NOTRE DAME, WIGAN.—A new laboratory and classrooms have been erected at the pupil teachers' centre at the Convent of Notre Dame, Wigan. The new portion has been so designed as to connect with the existing buildings. The walls are of red pressed bricks, with red Rainhill stone dressings, the roofs being covered with Welsh blue slates, finished with red ridge. The whole of the roofs are boarded and felted. A small tower, resting on stone corbels, has been introduced over the new entrance, finished with a stone parapet and green slate roof, the whole surmounted by an ornamental wrought-iron vane. All internal joiners' work is of selected pitch-pine. The main corridors, scullery, and lavatory on ground floor are tiled with red tiles; all the other floors are fitted covered with pitch-pine boards. The large hall, dormitory, nether community room, corridors, and teaching portions of new buildings are lighted by electric light, the other portions being illuminated by gas. All internal walls are coloured with Duresco distemper. The whole of the building is heated by hot water on the low-pressure system, by means of pipes and radiators. The main contractors for the work have been Messrs. Howard & Sons, Wigan, the following having been their sub-contractors for the several trades:—Masons, Messrs. Webster & Winstanley; plumbing and glazing, Messrs. Blackburn and Leyland; plastering, etc., Mr. Almond; painting, Mr. W. Harrison. The work was carried out from the designs and under the supervision of the architects, Messrs. Prescott & Bold, Wigan.

EXTENSION OF THE EDINBURGH UNIVERSITY UNION BUILDINGS.—Plans for the completion of the Union Buildings were passed at the Edinburgh Dean of Guild Court on the 1st inst. Mr. W. G. Macdonald, architect, Sydney Mitchell & Wilson, architects to the Union, for a comprehensive scheme of extension sufficient to provide for the growing needs of the Union,

and in that year a portion of the extension was proceeded with, which consisted of an addition to the dining-hall, the conversion of the old billiard-room into a smoking and conversation room, and the provision of a new billiard-room. The remaining portion of the addition about to be erected will consist of a block of buildings 75 ft. by 68 ft., partly three and partly four stories high. It will contain a library on the ground floor, 49 ft. 6 in. by 25 ft. and 19 ft. high, facing the north, having a broad gallery round three sides, with bookcases all round the walls as well as projecting on to the floor, so as to form bays round the room. A reading and writing room of the same size will be over the library. There will also be five rooms suitable for the accommodation of the officials and committees of the Union, as well as of other University societies and clubs, while, in connexion with the large hall and rooms and lavatory, there are to be provided. On the top floor at the back there is to be a new kitchen, with offices attached, while under the kitchen there will be a service-room on the dining-hall level, communicating with the kitchen by means of an electric lift and side stairs. The remainder of the back buildings will contain servants' hall, stores, etc. A new stair, finished in oak, will give access to the different floors. Considerable internal alterations are also to be carried out upon the existing portion of the buildings. The cost of the buildings now to be erected is about 8,500, and tenders for that amount are about to be accepted.

APPOINTMENT.

EASTBOURNE.—Mr. A. E. Prescott, Borough Engineer of Douglas, has been appointed Borough Engineer of Eastbourne.

FOREIGN.

FRANCE.—At its last sitting the Académie des Beaux-Arts elected M. Injalbert as successor to the late M. Thomas, by 19 out of 33 votes. The new Academician was born at Beziers in 1845. As a student he obtained the Grand Prix de Rome, received medals at the Salons of 1877 and 1878, and the Grand Prix of the Salon in 1889. Among his works may be mentioned a remarkable bas-relief, "La Tentation"; "Hippomane", the monument to Molière at Poitiers; that to Auguste Comte in the Place de la Sorbonne; and the decoration of the Pont Mirabeau at Paris. M. Injalbert has for some years been a regular exhibitor at the New Salon.

The Conseil Supérieur des Beaux-Arts has awarded the Prix National of the Salon to a painter, M. Henri Zo. Travelling scholarships have been awarded to two architect exhibitors, M. Despeyroux and M. Coutan. There is talk of building a new Lyric Theatre at Paris, in the Boulevard des Capucines, on the site sloping to the old Rue Basse du Rempart, between Rue Scribe and the Olympia. An exhibition of the results of archaeological exploration has been opened at the Petit Palais. An exhibition of the works of M. Albert Bonnard has been opened at the Georges Petit Galerie, Paris. It includes about 400 pictures, pastels, water-colours and drawings, and is a collection of considerable interest. A new Hotel for the Chamber of Commerce is to be built at Roubaix, at a cost of over 600,000 francs. The Municipality of Troyes has voted 3,200,000 francs for various educational establishments. The Municipality of Perpignan have decided on the erection of a new hospital at a cost of nearly 2 million francs. The building will be the subject of a competition. A competition is to be opened by the town of Bayle for the design for a new savings bank.

The Departmental Society of Architects of Doubs have elected M. Gustave Vieille as President for the current year. The Departmental Society of Architects of the Sud-Est have elected M. J. Febvre; and that of Nantes has elected M. Libandière. A competition has been opened, for French architects, for a new asylum for the aged and incurable at Saint Dizier. The death is announced, at the age of 61, of M. Seillier de Gisors, Inspecteur-Général of Bâtiments Civils and Palais Nationaux, Professor in the atelier of the Ecole des Beaux-Arts, architect to the Senate and to the Department of Post and Telegraphs. M. de Gisors was a "Second Grand Prix de Rome," and made his professional reputation mainly in the exercise of his duties as "Architecte des Palais Nationaux." His work at the Exhibition buildings of 1900 was rewarded by his appointment as "Officier" of the Legion of Honour.

MISCELLANEOUS.

LIVERPOOL AND THE HOUSING PROBLEM.—Mr. John A. Brodie, Liverpool City Engineer, has presented a report to the Corporation Housing Committee on his experiments to erect "slab" or concrete dwellings for the housing of the

artisan class at rentals much lower than the present scale. It was hoped that dwellings at one shilling per room per week rental would be possible. The experiment, though not successful, has not wholly failed. Practically waste material is used—that is, crushed clinker from the various refuse destructors, which, if not utilized, costs about 2s. 6d. per ton to dispose of. Concrete slabs for footways have been made with it, and foundations for street pavement, etc., but not 38 per cent. of the total output of clinker is used. For the dwellings, the crushed clinker is mixed with Portland cement, reinforced with a little steel. This composition was moulded into slabs 14 in. thick, of the size equal to about half the side or part of a dwelling, and put into position on the dove-tail principle, secured with a few iron bolts for additional security. The experimental block of tenements has been erected in Eldon-street, near Vauxhall-road, on a site of 413 sq. yards, 234 of which is occupied by buildings and 179 sq. yds. are open space. Architecturally, the tenements are an improvement on many of the brick dwellings. Each tenement comprises a living room 15 ft. by 10 ft. 4 in., two bedrooms 15 ft. 3 in. by 7 ft. 9 in., and 10 ft. high; a scullery, water-closet, ash shoot, cooking range, food cupboard; all the rooms have fire-grates. The floors are covered with 1-in. boards embedded on a hot pitch mixture, and nailed down to scantlings embedded in the concrete. The best treatment of the walls is, the engineer found, with distemper wash. With regard to the moulding of the slabs, the engineer adhered as closely as possible to the methods employed in the construction of street foundations, in which the men of his department have great experience, the crushed destructor clinker and cement being mixed by hand, then filled into an adjoining mould and thoroughly consolidated by ramming and beating in the ordinary way. No damaged slabs were used, and the concrete floors were constructed in situ to reduce delay. Principally owing to unforeseen difficulties and to the novelty of the methods of construction adopted, and the consequent want of experience on the part of all concerned, the expenditure on the building proper has amounted to 3,193, and to this sum should be added plant, etc., charges to the amount of 889, making a total of 4,072, as against the estimated cost of 1,230. The over-expenditure appears a large one on the estimate for a comparatively small block, but it is a very small amount if compared with the saving of at least 25 per cent. which would be effected on the housing operations of the committee by the adoption of this system on any considerable scale. The engineer is fully convinced that the cost of buildings on this system will be brought down to its original estimate, and probably lower, but to obtain the best results it will be necessary to carry out works on a larger scale, so that the full advantages of repetition and proper organisation may be obtained. With regard to the erection of any future buildings, if required by the Housing Committee, the engineer would be prepared to advise the Health Committee to accept an order for buildings equal to five blocks such as Eldon-street, at a cost not to exceed 25 per cent. less than brick buildings taken at 62 1/2 pence per room, or 1,700 pence per block, against 2,280 pence for brick buildings. In this price a large margin has been left for contingencies, as he is anxious not to have a repetition of over-expenditure on the amount voted; and, as it is probable that the Health Committee would carry out the work at less than this sum, the Housing Committee would be given the benefit of any reduced cost.—*Liverpool Post.*

NATIONAL LIBRARY AND MUSEUM, WALES.—The Committee of the Lords of the Privy Council have issued their report, in which they recommend that the proposed national museum should be established at Cardiff, and the library at Aberystwyth, and that each institution should be managed by a governing body to be appointed under a Royal charter.

THE SLATE TRADE.—The recent reduction in prices at Portmadoc has been followed by a slight reduction at the Carnarvonshire Quarries, in both cases only on 20 in. by 10 in., and smaller sizes, the larger being in good demand. It is believed that this will have a very good effect on the demand for Bangor slates, as trade in Lancashire is very brisk, but merchants were holding back orders as much as possible in anticipation of a fall in prices.

CLIFFORD HOUSE, WIMBLEDON.—Messrs. Palgrave & Co. write:—"Regarding the paragraph about this in your last issue, will you kindly allow us to state that by arrangement with Messrs. Pons & Glenny we propose to substantially adopt the scheme as prepared by them a year or so back, and approved by the authorities, but the elevations are designed by us."

THE USHER HALL, EDINBURGH.—A meeting of the Special Committee of Edinburgh Town Council on the Usher Hall scheme was held on the 13th inst. The Committee, it is stated, had before them a draft report prepared by Mr. Morham, the City Architect, and the reports of the experts engaged by the Corporation to examine and report upon the Synod Hall—Sir Aston Webb and Dr. Cowen. The matter was gone into at considerable

length, but no decision was arrived at, in view of the fact that the motion of Bailie Douglas, with regard to the erection of the Hall, has not been disposed of. The preliminary memorandum for the report states that the cost of the dome as shown on the plans would amount to £6,187, but if the dome were removed the remaining space could be filled in with the flooring, gallery, roof, etc., for 1,779, thus leaving a net saving of £4,208. With regard to the question in their remit as to whether the plans could be amended so that the hall should receive sufficient daylight and thus obviate the necessity for electric light during morning or afternoon concerts, the Committee include in the report a table which gives information regarding the lighting of various halls ranging from 1 sq. ft. of window to each 245 cubic ft. of space to 1 sq. ft. of window to 2,900 cubic ft. of space. Through the removal of the dome and the gallery accommodation, as well as that in the ground floor, might be increased by 300 seats, and that in the gallery might still further be increased by 142 in an extra row and a balcony, altogether 450. By restricting the height of the foyer, the upper gallery could be considerably lowered. The last point in their remit was that of the acoustics of the proposed building, and the Committee give the reports of Sir Aston Webb, R.A., and Dr. F. H. Cowen. The former approves of the proposal to dispense with the dome and run the cove under the ceiling continuously, and to light by a clearstory below the cove. Besides the outlines of a hall carrying the galleries over one half of the corridor at the gallery level, but admits that the cost would be affected by the extra foundations required by two sides of the building. Dr. Cowen suggests that the new hall should be made to accommodate from 2,500 to 3,000, including the platform, whereas the hall indicated by Sir Aston Webb would give room for nearly 4,000. What is suggested by the architects is to restrict the length of the hall in proportion to the width as fixed by the lines of the old walls, adjusting the height correspondingly by which there would be provided seating accommodation for 3,000. The length of this hall would be 175 ft., the width 70 ft., and the height 56 ft. The area is calculated to hold 1,697, the balcony and lower gallery 656, the back gallery 600, and this, with 577 seats in the orchestra benches, would make a total of 3,630. By adopting a closer order of sitting in the area and galleries the hall could be made to accommodate 3,841. According to the lowest tenders received, and dispensing with the dome, and assuming that the alternative of the shorter hall is adopted, the contractors' estimates may be taken as amounting to £4,800. To this there would have to be added for electric lighting and painter work, etc., £13,470, which, with £2,560 for the site, makes the total cost, exclusive of organ, £130,620.—*Edinburgh Evening Dispatch.*

INLAYING METALS.—Mr. Sherard Cowper-Coles, on June 28, will give an exhibition at Grosvenor Mansions, Victoria-street, of his new method for blending and inlaying metals. It is stated that a variety of colours and new effects can be obtained, as one or more metals can be inlaid and blended in a similar manner to enamels, but at a much lower temperature.

CAPITAL AND LABOUR.

THE DISPUTE IN THE NEWCASTLE BUILDING TRADE.—The efforts to bring the strike in the building trade in Newcastle and district to a conclusion have so far been ineffective. It was thought that the conferences with the employers at Mr. Leeson's office would have seen the beginning of the end. What transpired at those conferences was officially made known on the 9th inst., after the employers had held one of their weekly meetings, at which the situation was discussed. The masters had been notified that the bricklayers had full power to settle; but, after one or two rules had been discussed and practically settled, they found that the bricklayers were only empowered to settle certain points. It appears that the bricklayers had taken a vote of their members, the result of which was only known to Mr. Hope, their chairman. The bricklayers objected to the arbitration rule proposed by the employers, and the latter offered to strike this out and substitute the arbitration rule which has been in existence with the joiners for twenty years, and which has been accepted by the masons. To this the bricklayers replied that they would have to take a ballot of the members. On the wages question the employers offered to settle on Mr. Leeson's suggestion of a compromise of 9d. per hour, as had been done in the case of the joiners and masons. To this the bricklayers would not agree. As for the apprentice rule, the men wanted the re-insertion of the regulation restricting the number to any one master to four, irrespective of the number of men employed. The employers could not entertain this suggestion, but offered, as a compromise, to allow the bricklayers the same restriction as applies to the plasterers—viz., that the apprentices should not exceed one to every four journeymen. With this, again, the bricklayers could not agree. The bricklayers also asked that in the event of a settlement

could the men return to work at once. The employers told them that the men could only return to work when the other areas affected by the dispute had also agreed or come to a settlement. The employers state that the areas affected have four separate bricklayers' branches, each branch having power to settle its own local affairs. On the other hand, the employers are amalgamated over these districts, and no one section will settle and leave the others in the lurch. This position was explained to the men at the beginning of the dispute, and their own national chairman suggested then that the best means of settling would be to have delegates from each branch to meet the representatives of the masters from the different districts; but this the operatives would not agree to. Consequently, the masters say, they were left with no option but to discuss the terms of settlement sectionally, while they would not give up the principle of dealing with the matter as a whole. The Newcastle bricklayers' delegates, as a result of this attitude, said they would call delegates from the different districts affected, and report the decision in due course. At the meeting with the plasterers, the latter's delegates stated that they had decided to accept nothing less than 10d. per hour. The employers explained that, though they could get an ample number of men at 9d. per hour, their members were anxious to settle the dispute, and were quite willing to agree to the suggestion of Mr. Leeson that the wages should be 9d. per hour. The plasterers, however, declined the compromise. The arbitration rule as agreed to by the masons the employers also offered to substitute for the one they had previously suggested; but this, also, was refused. The plasterers also objected to any alteration of the notice rule, which has been agreed to by the masons.—*Newcastle Chronicle.*

PATENTS OF THE WEEK.

APPLICATIONS FOR PATENTS.

6,128 of 1904.—A. F. BURKH: *Apparatus for Cooling, Heating, and for similar purposes.*

Apparatus for cooling, heating, and for similar purposes, consisting in the combination with a casing of metal sheet in opposite directions, alternately, or of separate sheets, each so joined to the sheet on either side of it as to form two independent series of chambers and having on one surface nodules and on the other surface ridges, a grid at one of the inlets to the casing to protect the edges of the sheets, a supply pipe for a cleansing charge opening into the casing, and a baffle arranged to protect the pipe.

15,390 of 1904.—L. A. CAMBIER: *Furniture Joints.*

This relates to furniture, and more particularly to joints for the legs of chairs or other pieces of furniture. According to the invention each leg is connected with the frame of the chair, seat, or the like by means of a separate angular stiffening strut or strap, preferably of metal, in such a manner that the apex of the strap is fixed to the chair-leg whilst the extremities of its two arms are fixed to the chair or other piece of furniture upon either side of the leg, so that each leg of the chair is connected with its seat independently of the others by a separate angle-piece, thereby constituting an exceedingly strong and rigid connection between the seat and legs of the chair. These angle or stiffening pieces are not liable to distortion.

15,933 of 1904.—THE BRITISH THOMSON-HOUSTON CO. LTD. (THE GENERAL ELECTRIC CO.): *Hoisting Apparatus.*

This relates to a hoist consisting in the combination of a bracket engaging the driving-shaft, and arranged to be tightened by a movement of said shaft for lowering and to be loosened by a movement of said shaft for hoisting, a manually-operated controlling lever for said hoist, connections between said lever and said bracket whereby the bracket is loosened when said lever is moved for lowering, a member having a frictional bearing on the shaft of the winding-drum, and connections between said member and said bracket whereby said bracket is released upon a hoisting movement of the winding-drum.

15,643 of 1904.—B. RATHMELL: *Cold Storage Chambers.*

This consists in the arrangement of a series of cooling pipes for keeping a low temperature in a cold storage chamber, either by direct cooling from exposed pipe surface or by the forced circulation of air cooled by being brought into contact with the aforesaid pipe surface, an arrangement of screens with removable portions and adjustable ports therein, together with shut-off valves for the said pipes and fan, preferably outside the chamber, by means of which the aforesaid cold storage chamber may be readily

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

adapted at any time for the storage of any particular class of goods.

15,724 of 1904.—C. SHOWELL: *Casement Stay Fastenings.*

This invention relates to casement stay fastenings, and has for its object means for securing the casement arm fitting at any point. According to this invention the fastening mechanism consists broadly of two parts, the one part being secured to the fixed frame and the other part to the moving casement. That part which is secured to the moving casement consists of a pivot bracket, having a joint formed thereon to receive the one end of the adjusted arm or stay rod. The sectional shape of this arm may be varied. The other part of this fitting comprises a clamping device, which is pivotally carried upon a base plate, which latter is secured to the fixed frame. Where the casing is circular in shape the clamping device may be made from a solid lump, in which the hole through which the stay arm may work is drilled through, and upon the side of said hole the said lump is formed with two clamping ears to receive the binding screw, there being also an opening slot from the stay rod through the binding screw to the outside, to permit of the binding action by means of the screw pin. The lower end of this clamping lump is shouldered down, and a central screw hole made through upwards from below. This shouldered part is made to fit in the base plate. The said base plate is now passed on to the shouldered part and secured thereto by a screw pin, which is capable of being tightened upon the clamping lump, but leaving the base plate free to revolve.

15,838 of 1904.—I. ROWBOTHAM: *Device or Apparatus for Use as a Stevedore's Sling.*

This invention relates to a stevedore's sling, and is designed for lifting and lowering the like. The slings at present in use consist of a length of wire, having a hook at one end and an eye or loop at the other, so that when the eye or loop is attached to the crane, and the hook slipped on to the wire to gird in a sling of timber, the hook serves as the equivalent of a running rope, which is held tight by the grip round the sling of timber as the lifting strain is applied. The defect in slings of this kind is that, in approaching the final point of connexion between the wire rope and the hook, an advancing contact of intense pressure is set up, resulting in the deterioration of the tensile quality of the sling by crystallisation and the sling becomes unreliable in a short time. The object of the invention is to obviate this contact strain. According to the invention, instead of the sling being in one length it is made in two, one of which represents the half-girth of an ordinary-sized sling of timber, and terminates at each end in an eye or loop. This section is let down to receive the sling of timber, which is held up on it. The upper section, which is slung from the crane, is furnished at one end with an eye or loop for this purpose, and at the other with a hook to hook into an eye or loop of the lower section. In order to complete the connexion between the two sections, another hook is provided to hook into the other eye of the top section. This hook is slung from a slip tube adapted to run along the upper section to serve the purpose of a running noose, and may be of ordinary construction, or when used for what is termed "dumping," is made up of two limbs slung from the same shackle. A pin on one limb is adapted to fit into a hole in the other limb, which is done when the load is off. When the load is applied the lifting strain is relied on to hold the two limbs together.

18,372 of 1904.—A. CAMBIER: *Manufacture of Chairs and like Articles of Furniture.*

This invention has for its object a frame for chairs and like articles of furniture which is formed of bent wood in one piece in such a manner that it constitutes at the same time a front leg, hind leg, seat support, and back. According to the invention a straight piece of wood serving for the production of the frame is cut longitudinally in such a manner that a part is formed with a long arm and a short arm. After being steamed in a water-bath the piece of wood cut in this manner is bent so that one portion of the wood constitutes the back and hind leg portions, and the other part the seat support and front leg portion. If two such frame members are united, by means of a plate, which has either been previously bent into the requisite form or is bent into such shape when being placed in position, a chair is obtained comprised of two lateral frame members, each of which is formed from a single piece of wood. The chair legs and the seat of each such frame may also be rendered more rigid one with the other by means of a separate bent piece adapted to connect them together. If the piece of wood is sufficiently broad in the transverse direction and is bent into the form described, a seat of the chair type is obtained in which the seat and back plate may be regarded as united with the two lateral frames. The whole of the parts of such a chair or seat are thus formed out of a single piece of wood.

5,368 of 1904.—E. A. TRAFNELL: *Manufacture of Bricks, Tiles, and the like.*

This consists in the admixture, in a semi-dry condition, of two or more clays or clay shales, which, when burnt, will produce different colours and shades. The clays are ground in and passed through any semi-plastic machinery, and the bricks or tiles, so finished are then burned. The proportions of the different clays vary according to whether or not a predominant colour may be desired. The bricks, tiles, or the like so made present a mottled appearance. The clays must be made plastic in the process of manufacture.

4,983 of 1905.—F. DE MORSE: *Means for Fastening Bolts and Screws in Wood Work.*

This invention relates to means for fastening bolts and screws in wood work, and consists in providing a metallic, threaded stem, with a nut which is supported and prevented from rotating by a clamp, the said clamp being provided with projections and adapted to open up and engage the wood. The object of this invention is to utilise an arrangement simpler in manufacture and more efficient in operation than those hitherto used, and wherein the strain produced upon the threaded stem is supported by the nut, which transmits to the wood the bearing away effect through the intermediary of the clamp. This latter takes no part in any rotary motion, and forms a good seating or fastening. The threaded stem can be provided upon its outer end with a slot, ring, hook, or the like.

11,830 of 1904.—N. G. H. VON KAUFFMAN and C. E. H. MEDBURG: *Manufacture of Artificial Stone for Paving, Decorative, and other purposes.*

A method of manufacturing artificial stone from waste materials, characterised by the slats being ground finely and partly coarsely, wherefrom three mixtures are formed, consisting of glass powder, sulphite-cellulose, and bluish clay, in a solution of alum, oxide of zinc, sulphate of alumina, and burnt magnesite, hydraulic lime, chloride of calcium, and a solution of sulphite of potash, which three mixtures are mixed together with the addition of a weak solution of phosphate of soda and then mixed with coarsely-ground slats and poured into moulds pressed by hydraulic pressure, removed, and set in a liquid consisting of silicate of potash, sulphuric acid, and saltpetre, rinsed in warm water, and finally dried.

14,962 of 1904.—J. A. JAGGER: *Exit Doors for Theatres and Public Buildings.*

This invention relates to doors for use as emergency exits for theatres and other public buildings in case of fire or other alarm. The doors consist of a number of hinged leaves, the door in order that it will readily open when pushed from the inside, will be held in the open condition, and will be out of the way of people crowding through. In carrying out the invention, the door, instead of being supported upon hinges at the side in the ordinary manner, is supported by a series of rollers, which support the door arranged preferably a short distance from the top edge of the door; the door will thus be free to swing outwards from said supports so as to leave the doorway clear. The portion of the door above the supports is counterweighted so as to balance the portion below and allow of the door swinging easily.

When the door is swung upon its supports, will be retained at any point to which it is swung. Such means may be of any design, such, for instance, as ratchet wheels upon the supports adapted to rotate when the door swings, and parts pivoted to the door frame and engaging with the teeth of such wheels in such a manner as to allow of them rotating in one direction, but to prevent them rotating in the reverse direction.

5,550 of 1904.—T. CAIRN: *Apparatus for Removing Detritus Sludge and the like from Tanks, Wells, and other Receptacles.*

This invention is designed for the removal of detritus sludge or other matter deposited in liquids in tanks, wells, or other receptacles without entirely removing therefrom the overlying liquid. The apparatus consists of a pipe having its open lower end near the bottom of the tank, its upper end terminating wherever it is desired to discharge the solid matter, the second pipe being connected to the first pipe and leading to a cylinder surrounding the lower end of the said first pipe and rising above the level of the solid matter to be removed. The action of the apparatus is as follows:—Air is forced into the first pipe and mixes with the water therein, diminishing the specific gravity of the column in the pipe, the consequence of which is that the water in the tank outside such pipe is forced up the same with a velocity sufficient to carry with it the solid matter from the bottom of the tank. But as the solid matter may in some cases prevent the overlying liquid getting to the first pipe, the outer cylinder, the upper opening of which is placed above the solid

matter to be removed, is provided. The liquid flows down the annular space between the two pipes, and, impinging upon the solid matter which collects round its lower opening, disturbs it and carries it up the pipe.

15,463 of 1904.—F. SOMMER: *Apparatus for Stopping or Damming the Workings of Mines and the like.*

This relates to the stopping up or damming of disused workings in mines or of stulges, tailings, refuse or the like, and is effected in the following manner, viz.:—In that the refuse, sand, ashes, rubbles or the like is flushed by means of water through piping into the workings to be stopped or dammed. The material used is mixed with water in a funnel or the like at the inlet end of the pipe and conveyed through the pipe to the point at which it is to be discharged. With the present invention a portion of the water under a suitable high pressure serving to convey the sludge is admitted to the piping between the inlet and outlet openings.

350 of 1905.—J. E. LUCAS: *Swivelling and Folding Partitions for Dividing Rooms into Compartments.*

This relates to swivelling and folding partitions, consisting in the construction of the swivelling guide roller or rollers having roller or rollers with inclined flanges at a distance apart, with or without ball or roller bearings, and mounted in a carrier to swivel and fix to the underside or face or both of one or more sections of the partition, adapted for running on a rail or rails let into a fixed or movable sill piece, or into the floor itself, and means for preventing sound passing through the aperture of the top of partition and bottom of top guide rail, consisting of a top guide rail constructed of metal or wood of any suitable dimensions or shape, to each side of which, or to the beam or ceiling, is attached a hinged strip or cover piece, which rises or falls as the partition is opened or closed.

8,388 of 1905.—J. SEWARD, F. SMITH, and J. SKELTON: *Means for Filtering or Cleansing Air to be supplied to or passing out from hospitals, theatres, or other buildings, for the purpose of ventilating the same.*

Apparatus for filtering or cleansing air, consisting in the combination with a fan for inducing a current of air through a suitable opening communicating with the outer atmosphere and also with a room, building, or other enclosed space to be ventilated of an endless travelling belt of horse-hair or other pervious material made in immovable flanges at a distance apart, with or without ball or roller bearings, and mounted upon rollers, to the top one of which rotary motion is imparted by any suitable driving mechanism, the bottom roller being mounted in a trough to which water or other cleansing liquid is supplied, preferably in a continuous flow, and the spindle of which bottom roller is mounted so that it can move vertically in a slotted bracket, a stationary brush or other rubbing surface set at an angle to the direction of travel of the endless travelling filtering belt or screen, and upon the outer surface of which it bears, for the purpose of removing the impurities which have become deposited on the surface thereof and allow same to fall back into the trough containing the cleansing or purifying liquid, in which is mounted the bottom roller over which such endless travelling belt passes.

15,463 of 1904.—R. BOWES: *Fireplaces or Hearths.*

This relates to a fireplace or hearth, consisting in the combination with a freelay or equivalent trough a grate formed of a front and back part, the front part turning on the back or on a back support with means for raising the front edge of the front part for cleaning purposes, a series of embayments whereby the air can descend through these embayments, a front projection on the grate rising up above the level of the hearth, and adapted to be used for or with a handle.

15,538 of 1904.—W. C. WEDERKIND and P. STUART: *Reinforced Concrete Structures.*

This invention has for its object to provide means whereby the transverse beams or bars used in reinforced concrete structures can be supported upon the main girders. According to this invention, a bar or beam is at each end supported by the stirrups hung over the main girder side by side. These stirrups are each notched or recessed to receive about half of the beam, so that when the two stirrups are placed together they will embrace the beam between them. In practice, the pieces which are removed to form the notches or recesses are bent down so as to afford bearing surfaces for the beams. The chief advantages claimed are that beams of H-section can be used, and that the construction of the stirrups is relatively inexpensive. It will be understood that each pair of stirrups can carry the ends of two beams—that is to say, one on each side of the main girder.

12,940 of 1904.—H. VOLES: *Artificial Granite and Process for the Manufacture of the Same.*

This invention relates to the manufacture of artificial granite for use for building or other suitable purpose, and the object of the invention is the production of a cheap and durable substance

or composition which when set has the appearance of granite, and which can be used for many, if not all, the purposes for which natural granite is employed. For the purpose of the invention, granite or marble chips or both are taken and mixed with a suitable proportion of cement, together with any other suitable ingredient or ingredients if desired, suitable colouring matter being added, the whole being mixed until they constitute a paste, sufficient water being mixed with the ingredients to allow of the required consistency being obtained. The mixture is placed in suitable moulds, in which it is allowed to remain until sufficiently set, after which the blocks or the like are removed from said moulds and immersed for a suitable period in water until they have taken up or absorbed sufficient moisture, when they are removed and placed in a shady or sufficiently warm place until they attain the required dryness and hardness, the blocks, slabs, or the like being then in a rough state and ready for polishing.

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SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.	
June 1.—By WINCH & SONS (at Maidstone). Brenchley, Kent.—"Mascall Court Farm," 116 a. 1 r. 26 p. f. (in lots).....	£4,110
Pembury, etc., Kent.—"Potters Farm," 35 a. 0 r. 28 p. f. (in lots).....	1,405
Wittersham, etc., Kent.—"Maynes Farm," 58 a. 2 r. 56 p. f.	950
Three freehold enclosures, 11 a. 3 r. 21 p.	200
June 2.—By JOHN DITCH (at Tunbridge Wells). Hartfield, Sussex.—"Newbridge Farm Mill" and 10 a. 3 r. 2 p. f., yr. 40.....	1,600
Bothelsham, Sussex.—A freehold residence and 2 a. 3 r. 20 p. yr. 101. 19s.	1,200
June 3.—By SALTEE, SIMPSON, & SONS (at Norwich). Searnigh, Norfolk.—"Duffy Green Farm," 235 a. 2 r. 0 p. f.	3,500
Mattishall, Norfolk.—"The Malbous Farm," 115 a. 1 r. 28 p. f.	2,300
Freehold residence and shop, p.	200
The "Crown and Anchor Inn," f. p.	970
Various enclosures, 37 a. 2 r. 1 p. f.	970
June 4.—By J. M. R. RALLS. Halstead, Essex.—"The Wash Farm," 52 a. 3 r. 8 p. f.	1,000
By HINDLEY & WILKINSON. Malden Vale.—11, Warrington-cres., ut. 54 yrs., g.r. 25d.	1,100
By OSBORN & MERCER. Shaw-cum-Donnington, etc., Berks.—"Donnington Priory," 59 a. 3 r. 28 p. f. p.	10,525
By FRED. TAYLOR. Frinton-on-Sea, Essex.—Marine-parade, corner plot of land, f.	210
Romford, Essex.—Gilbert-rd., "Haredale," f., yr. 45d.	685
June 5.—By ABERCROMBIE & EDWARDS. Willesden Green.—12, Dean-rd., ut. 174 yrs., g.r. 81. 10s., cr. 55d.	405
By CHINNOCK, GALSWORTHY, & CO. Holborn.—12, 13, 14, and 15, Drury-ls. (s.), f., yr. 360d.	9,440
By DEBENHAM, TEWSON, & CO. Aldersgate.—Glasshouse-yard, l.g. 94, reversion in 97 yrs.	275
Peckham.—105 to 123 (even), Choumert-rd., f., w.r. 287d. 16s.	2,475
Kennington.—29 and 31, Lower Kennington-ls. (s.), f., yr. 97d.	780
Finchley.—45 and 47, Station-rd., f., yr. 80d.	590
Worthing, Sussex.—10, Liverpool-ter., f., yr. 40d.	560
Peckham.—34, 130, and 132, Eyle-ls. (s.), f., yr. 270d.; also l.g. rents 150d., ut. 61 yrs., g.r. 110d.	4,550
Rye-ls., etc., l.g. rents 144d., ut. 616 yrs., g.r. 115d.	600
Stoke Newington.—7, Milton-rd., ut. 57 yrs., g.r. 61d.	240
1 to 6, Philip-st., ut. 412 yrs., g.r. 21d., w.r. 58d. 4s.	115
Islington.—9 to 19 (odd), Orchard-st., ut. 151 yrs., g.r. 48d., w.r. 157d. 6s.	140
23, Rotherfield-street; also Sherborne-mews, ut. 18 yrs., g.r. 18d., yr. 81d. 8s.	100
Hackney.—6, 7, 8, 9, and 10, Halmsey-pl., ut. 30 yrs., g.r. 24d. 6s., w.r. 122d. 4s.	815

By DRIVER, JONAS, & Co. Haymarket—Nos. 65, 67, and 68, also 13 to 17, Charles-st., 10 and 11, St. Alban's-pl., including the Western Synagogue and Hearn's Livery Stables, u.t. 9 yrs., g.r., etc., 87l. 9s., y.r. 2,418l. 1s.	17,400	Belgravia—41, Lower Belgrave-st. (s.) and 51, Chester-pl., g.r. 18½ yrs., g.r. 6l., y.r. 130l.	£1,150	Ash, Kent—"Park Wood," 10 a. 0 r. 38 p., 1 l. p.	1,150
By DICKINS & SONS. Camberwell—33, George's-road, l.g.r. 16l., reversion in 87 yrs.	395	Holloway—Tufnell Park, l.g.r. 50l., u.t. 49 yrs., g.r. 1l. 10s.	1,050	Hoddeston, five freehold cottages (named), "Leader's Farm" (or Lower Yard), 16 a. 3 r. 38 p. f.	475
By HAMPTON & SONS. Battersea—St. John's-hill, f.g. rents 139l., reversion in 54½ yrs.	4,040	Holloway-rd., l.g.r. 22l., u.t. 17½ yrs., g.r. nil	800	Stanstead, Kent—"Lightfoot Cottages" (two) and 4 a. 0 r. 23 p., f. yr. 12. 18s.	350
Albert Bridge-rd., l.g.r. 122l., reversion in 90 yrs.	3,130	Camden Town—St. Paul's-rd., l.g.r. 10l., u.t. 40 yrs., g.r. nil	170	Swanscombe, Kent—"Bayly's Orchard," 0 a. 3 r. 3 p., l. p.	400
Great Baddow, Essex—"Baddow-ct." and 17½ acres, f. p.	4,500	Belgravia—Bacon-csg., l.g.r. 47l., u.t. 17 yrs., g.r. 10l., with reversion	750	By F. DOD & CO. Dalston—1, St. George's-rd., with hall in rear, u.t. 61 yrs., g.r. 2l. 2s. p.	500
By HILLIER & PARKER. Soho—7, Noel-st., w.r. 107l. 18s.	1,370	Pimlico—Cumberland-st., l.g. rents 48l., u.t. 63 yrs., g.r. 2l. 8s., with reversion	775	Kenley, Surrey—Foxley-rd., a freehold building site	285
By W. F. & H. NOSOTT. South Kensington—11, Colchester-ter. (s.), u.t. 45 yrs., g.r. 16l., r. 180l.	1,650	Lee—Lee-pk., l.g. rents 15l., u.t. 51 yrs., g.r. nil	610	By WELLS & BLINCHETT. Holloway—139 and 141, George's-rd., f. yr. 56l.	730
By BATES, BEX, & CO. Hampstead—Bleek-rd., f.g. rents 24l., reversion in 80 yrs.	550	Tooting—2 to 7, Osborne-villas, f. w.r. 131l. 0s.	1,620	Contractions used in these lists—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; l.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e. for estimated rental; w.r. for weekly rental; q. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p. a. for per annum; ym. for years; l. a. for lane; st. for street; rd. for road; sq. for square; p. l. for place; ter. for terrace; cres. for crescent; av. for avenue; r. for railway; g. for garden; p. b. for public-house; p. b. for public-house; o. for offices; s. for shops; ct. for court.	
Kensal Town—Clarence-rd., l.g.r. 25l. 4s., u.t. 31 yrs., g.r. 4l.	370	Wandsworth—4, 5, and 6, Railway-ter., and 2s, Thorne-st., f. yr. 100l.	590		
Orchard-pl., l.g.r. 10l., u.t. 33 yrs., g.r. nil	155	2s, Thorne-st., f. yr. 100l.	2,000		
Victoria-rd., l.g.r. 45l. 3s., u.t. 34 yrs., g.r. 3l.	680	2 to 12 (even), 17 to 27 (odd), Thorne-st., f. w.r. 267l. 10s.	2,420		
Lady Somerset-rd., l.g.r. 24l. 10s., u.t. 65 yrs., g.r. 4l.	400	27 to 37 (odd), Grosvenor, f. w.r. 143l.	1,230		
Burghley-rd., l.g.r. 20l. 14s., u.t. 65 yrs., g.r. 4l.	425	By MOTTIN, WHITE, & CO. Dulwich—125, Melbourn-csg., u.t. 70 yrs., g.r. 8l., y.r. 26l.	265		
Stoke Newington—St. Mark's-rd., etc., l.g.r. 21l., u.t. 70 yrs., g.r. 10l.	190	271, Lordship-lane, u.t. 89½ yrs., g.r. 7l., a.r. 38l.	460		
By Woods. Stoke Newington—18, Shelgrove-rd. (factory), f. yr. 40l.	550	Holloway—144 and 145, Tollington-pk. (s.), u.t. 58 yrs., g.r. 4l. 4s., y.r. 150l.	1,770		
By HUMBERT & ELNIE. Langley, Bucks.—Bath-rd., enclosure of land, 1 a. 3 r. 18 p.	745	Haverstock Hill—72, Upper-pk-rd. (s.), u.t. 45½ yrs., g.r. 12l., y.r. 62l. 10s.	190		
Horton, Bucks.—Bath-rd., freehold building land, 3 a. 2 r. 0 p.	700	City Road, 5, Remington-st., u.t. 104 yrs., g.r. 4l., y.r. 34l.	180		
Part of "Mildreds Farm," 7 a. 2 r. 6 p. l. t. Godson's Field (fruit plantation, etc.), 28 a. 3 r. 20 p., f. yr. 145l.	300	By SIMMONS & SONS Clapham—216, Elms-rd., f. e.r. 50l.	650		
Freehold arable land, 27 a. 2 r. 31 p. "Ashgood Farm," 46 a. 3 r. 87 p. f. yr. 105l.	3,500	Chelsea—Elm Park-rd., l.g.r. 10l., u.t. 9½ yrs., g.r. nil	115		
Four freehold cottages, g.r. 32l. 16s.	850	Gertrude-st., l.g.r. 12l., u.t. 62 yrs., g.r. 2l. 10s.	160		
Colbrook, Bucks.—Freehold cottage and old school, f. yr. 15l. 6s.	2,900	Shalcombe-st., l.g.r. 10l., u.t. 62 yrs., g.r. 1l. Kensington—Fembroke-sq., l.g.r. 10l., u.t. 17 yrs., g.r. 7l. 1s.	160		
Horton, Bucks.—Freehold cottage and smithy, f. yr. 20l.	500	Chalk Farm—Ferdinand-pl., l.g.r. 18l., u.t. 23 yrs., g.r. 1l. 10s.	130		
Bel-lia, eight freehold cottages, y.r. 55l. 14s. Welley-rd., four freehold cottages, y.r. 22l. 2s.	200	Kensal Town—Hawley-rd., l.g.r. 12l. 10s., u.t. 81 yrs., g.r. 6s.	175		
Wraybury, Bucks.—"Manor Farm," 210 a. 2 r. 3 p. f.	740	Castle-rd., l.g.r. 12l., u.t. 80 yrs., g.r. 6s.	160		
By G. HASLETT (at Mason's Hall Tavern). Dalston—Brownlow-st. "Brownlow Arms" (p.h.), profit rent of 50l. for 34½ yrs.	4,050	Dalston—Mayfield, l.g.r. 30l., u.t. 62 yrs., g.r. 1l.	160		
Camden Town—Saudal-rd., Railway Tavern" profit rent of 50l. for 56 yrs.	790	Stoke Newington—Bouvierie-rd., l.g.r. 12l. 10s., u.t. 52½ yrs., g.r. 2l.	180		
Old Ford—26, 28, and 30, Roman-rd. (s.), u.t. 45½ yrs., g.r. 4l. 10s., y.r. 160l.	705	Peckham—Dunman-rd., l.g.r. 30l., u.t. 62 yrs., g.r. 1l., with reversion	280		
By BRODIE, TIMMS, & CO. (at Middlebrough). Middlebrough, Yorks.—Oxford-rd., etc., 20 plots of land, f. (Linthorpe Estate).	3,420	Peckham—1, Cicely-rd., u.t. 57 yrs., g.r. 30s., y.r. 30l.	230		
The Cres., two building sites, area 4,900 ft. l. June 7.—By BAXTER, PAYNE, & LEPPER. Cudham, Kent—"Mace Farm," 15 a. 1 r. 38 p., f.	2,567	Dulwich—Lordship-lane, l.g.r. 6l. 5s., u.t. 68 yrs., g.r. nil	135		
Enclosure of freehold land, 27 a. 0 r. 22 p. Northfleet, Kent.—Rural Vale, f.g. rents 25l. 18s., reversion in 23 to 27 yrs.	1,600	Camberwell—Flaxman-rd., l.g.r. 23l., u.t. 60 yrs., g.r. nil	125		
By BLAKE & DANFAT. Greenwich—17 to 23 (odd), Winiford-st., f. w.r. 62l.	480	Norwood—Weston Hill, l.g.r. 15l., u.t. 11½ yrs., g.r. nil	105		
Sydenham—33 and 35, Wellesley, f. yr. 51l.	595	Mile End—60 and 64, Mile End-rd. (s.), u.t. 24½ yrs., g.r. 13l., y.r. 120l.	4,150		
By G. HASLETT. Wimbledon—2, 3, and 4, The Broadway (s.), f. yr. 315l.	705	Hackney—Wick-rd., "The Lamb" b.h., a freehold rental of 40l., reversion in 34 yrs.	600		
Sunnyside, l.g.r. 17l. 10s., reversion in 38 yrs.	9,610	220, Wick-rd. (s.), f. yr. 32l.	1,210		
Worple-rd., l.g.r. 10l. 10s., u.t. 46 yrs., g.r. 10s.	185	Bethnal Green—15, Chesire-st., and 21, Winchester-st. (s.), f. p.	415		
By D. SMITH, SON, & OAKLEY. Bethnal Green—Weaver-st., f.g. rents 25l. 10s., reversion in 3½ yrs.	6,950	Southwark—20, Metrick-st., u.t. 20½ yrs., g.r. 4l. 16s. 3d., y.r. 42l.	405		
Weaver-st., etc., f.g. rents 9l. 10s., reversion in 3½ yrs.	2,263	By JOSEPH STOWER. St. Pancras—2 and 6, Kenton-st., u.t. 9½ yrs., g.r. 50l. 10s., w.r. 197l. 12s.	260		
Pedley-st., etc., l.g.r. 5l., reversion in 3½ yrs.	1,610	4, 7, 9, to 15, Chesham-rd., g.r. 72l., w.r. 521l.	180		
By E. & S. SMITH. Kensal Town—12 and 14, Weedington-rd., u.t. 34½ yrs., g.r. 12l., y.r. 66l.	500	By DANIEL WATNEY & SONS. City—Farn-st., f.g. rents 178l. 14s. 6d., reversion in 52½ yrs.	4,510		
17, Malden-rd. (s.), u.t. 44½ yrs., g.r. 6l., y.r. 45l.	385	By H. J. BLISS & SONS. Commercial-road East—Nos. 608, 609, 609, 611, and 613 (s.), c. yr. 255l. 10s.	5,395		
Holloway—95, York-rd., u.t. 66 yrs., g.r. 5l., w.r. 56l. 10s.	840	Brookley—25, Manor-rd., u.t. 57 yrs., g.r. 6l. 10s., y.r. 46l.	250		
Crouch End—61, Toppelfield-parade (s.), u.t. 88 yrs., g.r. 12l. 6s. 6d.	600	Forest Gate—24, 26, and 28, Beclive-rd., f. w.r. 74l. 2s.	630		
By DOUGLAS YOUNG & CO. City—11 and 12, Carthusian-st. (s.), u.t. 58 yrs., g.r. 122l., y.r. 340l.	1,000	Plastow—Cleeve-rd., l.g.r. 7l. 10s., reversion in 76 yrs.	140		
Clapham—Manor-st., l.g.r. 32l., u.t. 15½ yrs., g.r. 5s. 6d.	280	Kingston, Surrey—Cambridge-rd., l.g.r. 9l., reversion in 5½ yrs.	170		
Manor-st., l.g.r. 32l., u.t. 10 yrs., g.r. 2l. 9s. 39d. Clapham-rd., u.t. 11½ yrs., g.r. nil, u.t. 70l.	106	Greenwich—36 and 38, Cleland-rd., u.t. 53 yrs., g.r. 8l. 8s., w.r. 57l. 4s.	330		
35 and 37, Bedford-rd., area 7,600 ft. f.	2,000	14, 15, and 16, Ordinance-rd., u.t. 59 yrs., g.r. 8l., w.r. 62l. 8s.	440		
By CHAPMAN & MARTIN (at Hallsham). Hellingly, etc., Sussex—"Knightsbridge Farm," 169 a. 1 r. 10 p., f. p.	2,900	By GLASIER & SONS. Egham, Surrey—Chertsey-rd., two enclosures of freehold land, 26 a. 3 r. 24 p.	1,800		
June 8.—By CHRISTENSON & SONS. Kennington—18, Bedford-gdns. (studios and stabling), u.t. 70 yrs., g.r. 55l., y.r. 184l. 14s.	770	Dover, Kent—40, Odo-st., f.	145		
87, Camden-st., u.t. 10 yrs., g.r. 4l., w.r. 46l. 10s.	200	1 New-st., f.	160		
By CHURCH & HOOPER. Blackheath—3, Elliot Vale, u.t. 47 yrs., g.r. 6l., y.r. 65l.	500	9, Albany-pl., u.t. 75 yrs., g.r. 1l.	150		
		136, Clarendon-st., f.	155		
		18 to 16, Chapel-pl.	675		
		Temple Ewell, Kent.—Freehold house, shop, and meadow adjoining, p.	1,320		
		Two freehold cottages	460		
		June 9.—By C. H. BROWN. Pimlico—10, Cumberland-st., u.t. 27½ yrs., g.r. 9l., y.r. 60l.	450		
		105, Richmond-st., u.t. 20½ yrs., g.r. 6l., y.r. 51l.	455		
		46, Beesborough-gdns., u.t. 28½ yrs., g.r. 9l., w.r. 104l.	500		
		By DANN & LUCAS. Meopham, Kent—"Cook's Farm," 65 a. 1 r. 27 p., f. yr. 47l.	940		
		Calverstone Green, "The Old Brewery" and 5 a. 3 r. 27 p., f. yr. 10l. 10s.	290		

MEETINGS.

Monday, June 19. Royal Institute of British Architects.—To present the Royal Gold Medal for the promotion of Architecture, conferred by His Majesty the King to Sir Aston Webb, R.A., F.S.A., for his executed works as an architect, 8.15 p.m.	
Tuesday, June 20. Institution of Heating and Ventilating Engineers.—(Incorporated).—Summer Meeting, Bristol. 8 p.m.	
Wednesday, June 21. Institution of Heating and Ventilating Engineers.—Summer Meeting (continued). 10 a.m.	
Thursday, June 22. Society of Antiquaries.—8.30 p.m.	
Friday, June 23. Incorporated Association of Municipal and County Engineers.—Twenty-second Annual Meeting, Norwich.	
Saturday, June 24. Edinburgh Architectural Association.—Visit to Falkland.	
Sunday, June 25. Incorporated Association of Municipal and County Engineers.—Annual Meeting (concluded).	
Annual Dinner, Holborn Restaurant. 7 p.m.	

PRICES CURRENT OF MATERIALS.

* Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.	
BRICKS, &c.	
1 10 0 per 1000 alongside, in river.	
Hard Stocks	1 6 0
Bough Stocks	1 6 0
Grizzlies	2 2 0
Facing Stocks	2 2 0
Shippers	2 2 0
Filcons	1 14 0
Red Wire Chain	1 14 0
Best Fareham Red	3 12 0
Best Red Pressed	5 0 0
Knab's Facing	5 0 0
Best Blue Pressed	4 2 6
Staffordshire	4 2 6
Do. Bulstone	4 2 6
Best Stourbridge	4 0 0
Fire Bricks	4 0 0
GLAZED BRICKS	
Best White and	12 0 0
Ivory Glazed	11 0 0
Stretchers	12 0 0
Headers	11 0 0
Quoins, Bulstone	16 0 0
And Flats	16 0 0
Double Stretchers	19 0 0
Double Headers	16 0 0
One Side and two	19 0 0
Ends	19 0 0
Two Sides and one End	20 0 0
Splays	20 0 0
ferred, Squints	20 0 0
Best Dipped Salt	20 0 0
GLAZED BRICKS	
Quoins, Bulstone	14 0 0
Double Stretchers	14 0 0
Double Headers	14 0 0
One Side and two	15 0 0
Ends	15 0 0
Two Sides and one End	15 0 0
Splays	14 0 0
ferred, Squints	14 0 0
Second Quality	2 0 0
White and Dipped Salt	2 0 0
GLAZED	
Thames and Pit Sand	7 0 0
Thames Ballast	7 0 0
Best Portland Cement	27 0 0
Best Ground Blue Lime	20 0 0
NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.	
Grey Stone Lime	12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks	27s. 0d. per ton at rly. depot.

STONE.

Best Stone—delivered on road wag-	s. d.	
ons, delivered on road wagons,	1 6 1/2	per ft. cube.
Nine Elms Depot	1 8 1/2	" "
Portland Stone (20 ft. average)		
Whitbed, delivered on road		
wagons, Paddington depot, Nine		
Elms depot, or Fimlico Wharf...	2 1	" "
White Bass, delivered on road		
wagons, Paddington depot, Nine		
Elms depot, or Fimlico Wharf...	2 2 1/2	" "
Acceptor in blocks	1 1	per ft. cube, delivered, rly. dep't.
Best	1 10	" "
Deley Dale in blocks	2 4	" "
Best	2 5	" "
Comstock-Freestone	2 0	" "
Best Mansfield	2 4	" "
York Stone—Robin Hood Quality.		
Supplied random blocks 2 10		
in sawn two sides		
landings to sizes		
(under 40 ft. super.) 2 8		per ft. super.
in rubbed two sides		
ditto, ditto	2 6	" "
in sawn two sides		
slabs (random sizes) 0 11 1/2		" "
in 24 in. sawn one		
side slabs (random		
sizes) 0 7 1/2		" "
in 24 in. ditto, ditto	0 6	" "
Hard York—		
Supplied random blocks 3 0		per ft. cube,
in sawn two sides		
landings to sizes		
(under 40 ft. super.) 2 8		per ft. super.
in rubbed two sides		
ditto	3 0	" "
in sawn two sides		
slabs random sizes 1 2		" "
in self-squared random		
slabs	0 5	" "
Hyton Wood (Hard Bed) in blocks 2 0		per ft. cube,
delivered, rly. dep't.		
" " " 6 in. sawn both		
sides landings 2 7		per ft. super.
delivered, rly. dep't.		
" " " 3 in. sawn both		
sides random		
slabs, ditto	1 0	" "
" " " 2 in. do.	0 5 1/2	" "

SLATES.

l. in.	s. d.	
No. 10 best blue Bangor	12 6	per 1000 of 1200 at rly. d.
No. 12	13 17 1/2	" "
No. 10 first quality	13 0	" "
No. 12	13 15 0	" "
No. 8	7 5 0	" "
No. 10 best blue Port-	12 13 6	" "
madoc	6 12 6	" "
No. 10 best Eureka un-	15 17 6	" "
fading green	15 17 6	" "
No. 12	13 5 0	" "
No. 8	10 5 0	" "
No. 10 permanent green	11 12 8	" "
No. 12	13 12 6	" "
No. 8	6 12 6	" "

TILES.

Best plain red roofing tiles	42 0	per 1000 at rly. dep't.
Hip and Valley tiles	3 8	per doz.
Best Glossy tiles	50 0	per 1000
Do. Ornamental tiles	52 6	" "
Hip and Valley tiles	4 0	per doz.
Do. Brabant red, brown, or		
brindled do. (Edwards)	67 6	per 1000
Do. Ornamental do.	60 0	per doz.
Hip tiles	3 0	per doz.
Valley tiles	3 0	" "
Best red or Mottled Stafford-		
shire do. (Peakes)	51 9	per 1000
Do. Ornamental do.	54 6	" "
Hip tiles	4 1	per doz.
Valley tiles	3 8	" "
Best "Rosemary" brand		
plain tiles	48 0	per 1000
Do. Ornamental tiles	50 0	" "
Hip tiles	4 0	per doz.
Valley tiles	3 8	" "
Do. "Hartshill"		
plain tiles, and faced. 50	0	per 1000
Do. pressed	47 6	" "
Do. Ornamental do.	50 0	" "
Hip tiles	4 0	per doz.
Valley tiles	3 6	" "

WOOD.

Best 3 in. by 11 in. and 4 in.	s. d.	At per standard.
by 9 in. and 11 in.	13 10 0	15 0 0
Do. best 3 in. by 7 in.	13 0 0	14 0 0
Do. best 3 in. by 7 in. and		
8 in. and 3 in. by 7 in. and 8 in.	11 0 0	12 0 0
Do. best 2 1/2 in. by 6 in. and 3 in.	0 10 0	less than
Do. seconds	1 0	7 in. and 3 in.
Do. seconds	0 10 0	" "
Do. by 4 in. and 2 in. by 6 in.	9 0 0	10 0 0
Do. by 4 in. and 2 in. by 6 in.	8 10 0	9 10 0
Foreign Fir Boards		
1 in. and 1 1/2 in. by 7 in.	0 10 0	more than
batons.	1 0 0	" "
At per load of 50 ft.		
Do. timber: best midding Danzig	4 10 0	5 0 0
or Marnal (average specification)	4 0 0	4 10 0
Seconds	3 15 0	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 10 0	3 0 0
Ship-lime timber (50 ft. average)	3 5 0	3 15 0

WOOD (continued).

Joiners' Wood.	At per standard.	s. d.
White Sea: first yellow deals,	24 0 0	25 0 0
3 in. by 11 in.	22 0 0	23 0 0
3 in. by 9 in.	22 0 0	23 0 0
Battens, 2 1/2 in. and 3 in. by 7 in.	18 10 0	19 0 0
Second yellow deals, 3 in. by		
11 in.	18 10 0	19 0 0
Battens, 2 1/2 in. by 9 in.	17 10 0	18 0 0
3 in. by 9 in.	17 10 0	18 0 0
Third yellow deals, 3 in. by 11 in.	18 10 0	19 0 0
and 9 in.	18 10 0	19 0 0
Battens, 2 1/2 in. and 3 in. by 7 in.	18 10 0	19 0 0
Petersburg 1st yellow deals,	11 0 0	12 0 0
3 in. by 11 in.	21 0 0	22 0 0
Do. 3 in. by 9 in.	18 0 0	19 0 0
Battens	13 0 0	14 0 0
Second yellow deals, 3 in. by 11 in.	18 10 0	19 0 0
Do. 3 in. by 9 in.	18 10 0	19 0 0
Battens	11 0 0	12 0 0
Third yellow deals, 3 in. by		
11 in.	13 0 0	14 0 0
Do. 3 in. by 9 in.	12 10 0	13 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg		
First white deals, 3 in. by 11 in.	14 10 0	15 10 0
Battens	13 10 0	14 10 0
Second white deals, 3 in. by 11 in.	11 0 0	12 0 0
" " 3 in. by 9 in.	13 10 0	14 10 0
" " battens	10 0 0	11 0 0
Pitch-pine: deals	15 10 0	16 0 0
Under 2 in. thick	0 10 0	1 0 0
Yellow Pine—First, regular sizes	44 0 0	upwards.
Outlets	32 0 0	" "
Seconds, regular sizes	33 0 0	" "
Yellow Pine outlets	23 0 0	" "
Kauri Pine—Planks, per ft. cube.	0 3 6	0 5 0
Danish and Statian Oak Logs—		
Large, per ft. cube	0 3 0	0 3 6
Small	0 2 6	0 3 0
Walnut Oak Logs, per ft. cube.	0 5 0	0 5 6
Dry Wainscot Oak, 1/2 in. sup. as		
inch	0 8 0	0 8 6
3 in. do. do.	0 7 0	0 7 6
Dry Mahogany—Honduras, Ta-		
baco, per ft. super. as inch	0 0 9	0 1 0
Selected, Figury, per ft. sup. as		
inch	0 1 6	0 2 6
Do. Honduras, per ft. sup. as		
inch	0 10 0	0 1 0
Teak, per load	17 0 0	22 0 0
American Whitewood Planks,		
per ft. cube.	0 4 0	0 5 0
Prepared Flooring, etc.		
1 in. by 7 in. yellow, planed and	0 13 6	0 17 6
shot	0 14 0	0 18 0
1 1/2 in. by 7 in. yellow, planed and		
matched	0 16 0	0 1 0
1 in. by 7 in. white, planed and	0 12 0	0 14 6
shot	0 12 0	0 15 0
1 1/2 in. by 7 in. white, planed and		
matched	0 15 0	0 16 6
1 1/2 in. by 7 in. yellow, matched	0 11 0	0 13 6
and beaded or V-jointed brds.	0 14 0	0 18 0
1 in. by 7 in. do. do.	0 10 0	0 11 6
3 in. by 7 in. white do. do.	0 12 0	0 15 0
1 in. 1/2 in. 7 in. do. do.	0 12 0	0 15 0
6 in. at 6d. to 9d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

Rolled Steel Joists, ordinary	s. d.	At per standard.
sections	7 10 0	8 10 0
Compound Girders, ordinary	9 2 6	10 12 6
sections	7 10 0	8 10 0
Steel Compound Stanchions	7 15 0	8 5 0
Angles, Tees and Channels, ordi-		
nary sections	7 10 0	8 10 0
Fitch Plates	7 15 0	8 5 0
Cast Iron Columns and Stan-		
chions including ordinary pat-	6 12 6	7 15 0
terns		
METALS.		
Iron—		
Common Bars	7 0 0	7 10 0
Staffordshire Crown Bars, good		
merchant quality	7 10 0	8 0 0
Staffordshire "Marked Bars"	9 10 0	" "
Mild Steel Bars	8 5 0	9 15 0
Hoop Iron, basis price	8 15 0	9 0 0
" " Galvanized	16 10 0	" "
"(And upwards, according to size and gauge.)		
Sheet Iron, Black—		
Ordinary sizes to 20 g.	9 0 0	" "
" " 24 g.	10 0 0	" "
" " 28 g.	11 15 0	" "
Sheet Iron, Galvanized, flat, ordinary quality—		
Ordinary sizes—6 ft. by 2 ft.		
3 ft. to 20 g.	12 10 0	" "
Ordinary sizes to 22 g. and 24 g.	13 0 0	" "
" " 28 g.	14 0 0	" "
Sheet Iron, Galvanized, flat,		
best quality—		
Ordinary sizes to 20 g.	15 10 0	" "
" " 22 g. and 24 g.	16 0 0	" "
" " 28 g.	17 10 0	" "
Galvanized Corrugated Sheets—		
Ordinary sizes 6 ft. to 8 ft. 20 g.	12 10 0	" "
" " 22 g. and 24 g.	13 0 0	" "
" " 28 g.	13 15 0	" "
Best Soft Steel Sheets, 0 ft. by 2 ft.	11 0 0	" "
to 3 ft. by 20 g. and thicker	12 0 0	" "
Best Soft Steel Sheets, 22 g. & 24 g.	13 0 0	" "
" " 28 g.	13 10 0	" "
Cut nails, 3 in. to 6 in. usual trade extras.)	9 0 0	9 10 0

LEAD, &c.

Lead—Sheet, English, 8 lb. and up	s. d.	At per standard.
15 lb. coils	18 0 0	" "
Soil pipe	18 10 0	" "
Comp. pipe	18 10 0	" "
Zinc—Sheet	30 5 0	" "
Vielle Montagne	30 0 0	" "
Silestan	30 0 0	" "

LEAD, &c. (continued).

COPPER—	Per ton, in London.	s. d.
Strong Sheet	per lb.	0 11 1/2
Thin	" "	0 10 1/2
Copper nails	" "	0 11 1/2
BRASS—		
Strong Sheet	" "	0 9 1/2
Thin	" "	0 10 1/2
Try—English Ingots	" "	0 2 1/2
Solder—Plumbers	" "	0 8 1/2
Timmen's	" "	0 8 1/2
Blowpipe	" "	0 9 1/2

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	34d. per ft. delivered.	
" fourths	34d. "	
21 oz. thirds	34d. "	
" fourths	34d. "	
26 oz. thirds	34d. "	
" fourths	34d. "	
32 oz. thirds	34d. "	
" fourths	34d. "	
Flinted Sheet, 15 oz.	34d. "	
" 21 oz.	34d. "	
1/2 Hartley's Rolled Plate	24d. "	
" "	24d. "	
" "	24d. "	
" "	24d. "	

OILS, &c.

Raw Linseed Oil in pipes	per gallon	s. d.
" " in barrels	0 1 10	
" " in drums	0 2 10	
Boiled	" "	0 2 10
" " in pipes	0 2 0	
" " in barrels	0 2 0	
" " in drums	0 2 2	
Turpentine, in barrels	0 2 2	
" " in drums	0 2 2	
Genuine Ground English White Lead	per ton	19 15 0
Best Lead, Dry	" "	19 5 0
Best Linseed Oil Fully Oiled	per cwt.	0 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

Fine Pale Oak Varnish	per gallon	s. d.
Pale Copal Oak	0 8 0	
Superfine Pale Elastic Oak	0 12 6	
Superfine Hard-drying Oak	0 10 0	
Best of seeds of Churches	0 14 0	
Fine Elastic Carriage	0 12 6	
Superfine Pale Elastic Carriage	0 18 0	
Fine Pale Maple	0 18 0	
Finest Pale Durable Copal	0 18 0	
Extra Pale French Oil	1 1 0	
Engelshill Flattening Varnish	0 18 0	
White Copal Enamel	1 4 0	
Extra Pale Paper	0 12 0	
Best Japan Gold Size	0 10 0	
Best Black Japan	0 10 0	
Oak and Mahogany Stain	0 9 0	
Brunswick Black	0 8 6	
Berlin Black	0 10 0	
Knottling	0 10 0	
French and Brush Polish	0 10 0	

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 10s. per annum (26 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, &c., &c., 50s. per annum. Remittances (payable to J. P. MORGAN) should be addressed to the Publisher of "THE BUILDER," Catherine-street, W.C.

SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office 10s. per annum (26 numbers) or 4s. 6d. per quarter (13 numbers), can ensure receiving "The Builder" by Friday Morning's Post.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursday. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 1000, unless in some exceptional cases and for special reasons.]

* Denotes accepted. † Denotes provisionally accepted.

BRISTOL.—For the erection of a house for Mr. C. J. Hole, at Westbury-on-Trym. Mr. W. H. Watkins, architect, 15, Clare-street, Bristol:—

E. A. Chase	£907
CALVERLEY.—For laying 630 yds. of kerbing and channelling on Leeds and Bradford main road, for the Urban District Council. Mr. W. Walker, Surveyor, Calverley Urban District Council:—	
J. Watnagh, Bradford	
J. Watnagh, Bradford	
J. Watnough, Eccleshill	
J. Duckett, Bradford	
F. Barnatt, Bradford	
D. Parker, Bradford	
H. Barras, Shipley	
W. Pearson, Pudsey	
J. T. Chandler, Pudsey	
J. H. Knight, Farsley	
G. A. Walker, Farsley	
D. Grimshaw, Farsley	
M. Ruckledge, Barnsley	
H. Ackroyd, Calverley	

Schedule of prices.

CARRICKFERGUS.—For building a caretaker's house at Victoria Cemetery, for the Urban District Council. Mr. W. D. R. Taggart, architect, Scottish Provident Buildings, Belfast:—

Roberts & Armstrong	£313
McIntyre Bros.	279
S. W. Robinson	248
R. Hewitt	246
I. Copeland, White-street, Belfast	228

CHINGFORD.—For road works, Queen's Grove-road, etc., for the Urban District Council. Mr. W. Stair, Surveyor, 84, Station-road, Chingford:—

W. & C. French, Backhurst Hill. £1404

TENDERS.—Continued on page 665.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered
*New School, Bexhill-on-Sea	Education Committee	50l., 30l., and 20l.	July 27

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered
Wesleyan Church, Botteslow-street, Hanley	Bolton Wanderers Football Club ..	W. Campbell, Architect, Hanley	June 17
Grand Stand, Burnden Park, Bolton	do	Morris & Proft, Architects, 16, Nelson-square, Bolton	do.
Grand Stand, etc., Darlington	Austruther Easter Town Council ..	J. J. Harris, 6, Ardea-street, Darlington	June 19
Laying Setts, High-street and Cunniff-street	Subbury Guardians	R. & T. W. Currie, Architects, Elie	do.
Sanitary Annexes and Drainage at Workhouse	do	Clare & Ross, Architects, 1, West-street, Flushing-circus, E.C.	do.
Organ Chbr., etc., Tabernacle Chh., The Hayes, Cardiff	Mr. J. Hollingsworth	R. & S. Williams, Architects, Borough Chhbr., Wharston-st., Cardiff ..	do.
House at Birdwell, Yorks.	Bradford Corporation	A. Whitaker, Architect, Wombrough Bridge, Barn ley	June 20
Painting Names' Home at Horton-lane Workhouse	Leeds Education Committee	F. Holland, Engineer, 11 Parkins's-chbrs., Rustington, Bradford ..	do.
Repairs to Pump, Eastern Railway Station	Twickenham U.D.C.	Borough Engineer's Office, Town Hall, Portsmouth	do.
220 yds. of Stoneware Pipe Sewer, Edmondstown	Edinburgh & District Water Trustees ..	W. J. Jones, Engineer, Public Office, Penre, Rhondda	do.
60 yds. of Stoneware Pipe Sewer at Tonypany	Leeds Corporation	do	do.
Joiners' and Glaziers' Work for Screen	do	T. C. Hops & Son, Architects, 23, Bank-street, Bradford	do.
Alterations to Caretaker's House, Bradenell School	Edinburgh & District Water Trustees ..	W. S. Braithwaite, Architect, Education Office, Leeds	June 23
Broken Slag	Leeds Corporation	F. W. Pearce, Surveyor, Town Hall, Twickenham	do.
Fencing, Tulla Scheme (Contract 42)	Leeds Corporation	A. Tait, C.E., 724, George-street, Edinburgh	do.
Superstructure of Bridge over Holbeck	Leeds Corporation	City Engineer's Office, Leeds	do.
Mild Steel-plate Girders for Bridge	do	do	do.
Painting Outside of Police-stations	Standing Joint Com. of East Riding ..	County Surveyor, Beverley	do.
Alterations, etc., Warwick-road	Carlisle Steam Laundry Co.	Johnstone Bros., Architects, 39, Lowther-street, Carlisle	do.
Air Compressor, Steel Plates, Rolled Material	East Indian Railway Co.	O. W. Young, Secretary, Nicholas-lane, London E.C.	do.
School Buildings, Harfield, Stoke-upon-Trent	Education Committee	Lynam, Beckett, & Lynam, Architects, Stoke-upon-Trent	do.
Alterations, etc., to Calvin, Meth. Chap., Bynessholm	Darlington Corporation	P. J. Thomas, Architect, Bridgton	do.
Cast-iron Pipes, Valves, Flooding Arm, etc.	Brighton Borough Asylum	G. H. Gibbins, F.R.I.B.A., 3, Palace-place, Brighton	June 22
Alters, Repairs, Paint, etc., Haywards Heath Asy.	Denton U.D.C.	G. H. Newton, Surveyor, Town Hall, Denton	do.
Road works, Frederick, Gresswell, and Fern Bank streets	do	Engineer, Dewar-place Electricity Supply Station, Edinburgh ..	do.
Concrete Retaining Wall at Sewage works	Edinburgh Corporation	H. W. Collins, Architect, Clifton-road, Redruth	do.
Alterations to Steam Pipe Work, Dewar-place	do	C. C. Dolg, Architect, Elgin	do.
Additions, etc., Gerrans School, Portsea Chhbr.	do	do	do.
Two Cottages, Miltonhill	Rhondda U.D.C.	J. Rees, 61, Dinas-road, Dinas, Rhondda	do.
Cottage, Wester Colfield	do	W. Morton, Quantity Surveyor, 27, John-street, Sunderland ..	do.
Repairing, etc., Bethania Congrega. Chapel, Dinas	do	W. J. Jones, Engineer, Public Office, Penre, Rhondda	June 23
Repairs to Roof of Binbrook Church, Lincs.	do	do	do.
Street Works, Blaney-cum-terrace, Treherbert	do	do	do.
Street Works, The Parade, Porth	do	do	do.
Street Works, Price-street, etc., Ton	do	do	do.
Street Works, Dyfford-street, Ystrad	do	do	do.
1,300 tons of Cast-iron Pipes	Manchester Corporation	C. Nickson, Superintendent, Gas Dept., Town Hall, Manchester ..	do.
Carting Materials	Guildford R.D.C.	J. Anstee, Surveyor, Council Offices, Commercial road, Guildford ..	do.
Extension of Roof over Purilens	Barry U.D.C.	J. Graham, Architect, Bank-street, Carlisle	do.
Coal Elevating, etc., Plant	do	F. M. Harris, Engineer, Gasworks, Barry	do.
Extension of Coal Storage Hoppers	do	do	do.
Portland Cement	Brighton Borough Council	Borough Engineer, Town Hall, Brighton	do.
Bandstand at Wardown Park	Luton Town Council	Borough Engineer, Town Hall, Luton	do.
Unclimbable Iron Fence	do	do	do.
Erection of Ornamental Masonry Structure	Lancaster Corporation	J. Belcher, Architect, 20, Hauser-square, W.	do.
Shedding, etc., Chester Show	Cheshire Agricultural Society	T. A. Beckett, Secretary, St. Werburgh-chambers, Chester	June 24
Limestone	Bedwellty U.D.C.	J. Lewis, Engineer, Council Offices, New Tredgar, via Cardiff ..	do.
School of Art, Corporation, Causton	Somerset Education Committee	Somers & Gossan, Architects, 1, Hammett-street, Taunton	do.
Iron & Steel Work, Retort Ho. Floor, Rochedale-rd.	Manchester Corporation	C. Nickson, Superintendent, Gas Dept., Town Hall, Manchester ..	do.
Woolen Factory at Greenvale, Kilkenny	Abingdon Joint Hospital Board	P. Kennedy, Secretary, Kilkenny Woolen Mills, Ltd.	do.
Ward Block (sixteen beds)	Swindon Corporation	Borough Surveyor, Town Hall, Swindon	do.
*Supply of 3,000 Red Ware Grave Space Indicators	Beechenham U.D.C.	Council's Surveyor, Beechenham	June 25
*Making-up Roads	Altofts U.D.C.	J. A. Costes, District Council Office, Altofts	do.
Footpaths	Darlington Corporation	G. Winter, Borough Surveyor, Darlington	do.
Extensions & Renovations, Treherbert Chhbr.	Lewisham Borough Council	do	do.
Temporary School, Uphal-road, etc., to Schools	do	do	do.
Brick and Concrete Piers, Newark Bridge	Leeds Gas Committee	Stores Office, Meadow-lane, Leeds	do.
Iron and Steelwork, Newark Bridge	do	do	do.
Cleaning, Painting, Repairs, etc., to Schools	Rotherham Corporation	Borough Electrical Engineer, Rotherham	do.
Tar-paving Playgrounds, Northington-road School	Willslow & Alderley Edge Gas Co.	W. Severs, Engineer, Gasworks, Willslow	do.
Painter Work, George Heriot's Schol., etc., Edinburgh ..	Edinburgh School Board	Mr. Carnegie, 3, Queen-street, Edinburgh	do.
*Med. Officer's Resid., Knowle County Asy., Fareham ..	Aberdeen Harbour Commissioners ..	B. Gordon Nicol, Engineer, Harbour Engineer's Office, Aberdeen ..	do.
*900 tons of 2-in. Broken Granite	G.W. Ry. Co.	Kennedy & Jenkins, Engineers, 17, Victoria-street, Westminster ..	do.
*430 tons of Gravel	Ilford U.D.C.	H. Shaw, Engineer and Surveyor, Town Hall, Ilford	do.
*200 tons of Hoggins	Springhead U.D.C.	M. Clarke, Surveyor, Springhead, Oldham	do.
*Patent Office Extension, Finsbury-lane, E.C.	Hertfordshire C.C.	County Surveyor, Hatfield	do.
Reconstructing Old Quay Wall, Lower Harbour	St. Marylebone Guardians	J. Saxton Surveyor, 22, Southamptn-st., Chamber-lane, W.C.	do.
Shops, Offices, etc., High-street Church-street, etc.	Islington Borough Council	J. P. Barber, Borough Engineer, Town Hall, Upper-street, N.	June 27
*Repairing portions of Hammesmith & Uxbridge rds.	Southampton Corporation	Borough Engineer's Office, Southampton	do.
*Drainage System & Roads, Onger Children's House	do	do	do.
*Making-up Brill-street Carriageway	Ilford U.D.C.	Mr. Price, 74, Llewellyn-street, Penre	do.
do	Guildford R.D.C.	C. J. Dawson, F.R.I.B.A., 11, Cranbrook-road, Ilford	do.
do	do	Mr. Lewis, Duffryn-street, Penre	do.
do	Leyton U.D.C.	W. Jacques, Architect, 2, Fen-court, Fechurch-street, E.C.	do.
do	George Heriot's Trust	Mr. Anson, Superintendent of Works	do.
do	Barst U.D.C.	County Surveyor, The Castle, Winchester	do.
do	Commissioners of H.M. Works, etc.	H.M. Office of Works, Storey, S.W.	do.
do	Perth Town Council	R. McKillop, Burgh Surveyor, 12, Tay-street, Perth	June 28
do	Rotherham Corporation	J. Platts, Architect, High-street, Rotherham	do.
do	Borough of Hammesmith	Borough Surveyor, Town Hall, Broadway, Hammesmith	do.
do	Hackney Union	Clerk's Office, Hackney Union, Homerton, N.E.	do.
do	Borough of Fulham	Borough Surveyor, Town Hall, Fulham	do.

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered
Internal Painting Works, Children's Homes, Sidcup	Greenwich Guardians	S. Saw, Clark, Union Offices, East Greenwich	June 29
Church, etc.	Branksome U.D.C.	S. J. Newman, Council-buildings, Branksome, Parkstone, R.S.O.	June 30
Water Works, Wimborne Minster, Dorset	Asby Woulds U.D.C.	W. J. Fletcher, Architect, Wimborne	July 1
Water Village Sewerage	Walton-on-Thames U.D.C.	H. Walker & Son, Engineers, Albion-chbrs., King-st., Nottingham	do.
Making-up Burwood Park-road	Faversham Corporation	A. Tassell, 20, West-street, Faversham	do.
Road Metal	Widnes Corporation	J. S. Sinclair, Borough Surveyor	July 3
Greenhouses, etc., Victoria Park, Widnes	do.	do.	do.
Stables, etc., Appleton House, Victoria Park	Bradford Education Committee	Stores Department, Education Office, Manor-row, Bradford	do.
Pool Furniture	Cowbridge R.D.C.	Kirby, Son, & Brown, Water Engrs., Stow-chbrs., Newport, Mon.	do.
Waterworks, Llewellyn Major	West Riding C.C.	W. Hargre, Divisional Clerk, Ecclesfield	do.
Painting, etc., at Provided Schools, Ecclesfield	Nelson Corporation	R. Ball, Borough Engineer, Town Hall, Nelson	do.
Concrete Bridge, Scotland-road	London C.C.	Superintending Architect's Department, 16, Pall Mall East, S.W.	July 4
Work of Dwell. Ho., Peckham Rye, into Dress'g Rms.	do.	do.	do.
Section of Dwell. Walls, etc., along Dart'g Fr. Hill	Rochester Corporation	W. Banks, City Surveyor, Rochester	do.
Stables, Marble Hill, Twickenham, into Bothy	Commissioners of H.M. Works, etc.	H.M. Office of Works, Storey-gate, S.W.	July 5
Work of Metal	Warrington Education Committee	T. Longdin, Borough Surveyor, Town Hall, Warrington	do.
Alterations and Additions to Southwark County Court	Metropolitan Water Board	R. Ball, Borough Engineer, Town Hall, Nelson	July 7
Painting and Cleaning Schools	Nelson Corporation	E. T. Johns, Thoroughfare, Ipswich	do.
Section Gas Plant and Engine at Sewage Works	Metropolitan Education Committee	Office of the Board, Embankment, E.C.	July 8
Painting and Decorating Council Schools	H.M. Works	Borough Surveyor's Office, Town Hall, Lewes	July 10
Work of S. E. Hospital Laundry, New Cross, S.E.	Lewes Town Council	C. S. Morris, County Surveyor, County Hall, Northampton	July 11
Electric Station at Hendon	Hertfordshire C.C.	C. S. Morris, County Surveyor, County Hall, Northampton	July 12
Road Metal	The Committee	W. Gale Hasleham, Rosemeath, Palmerston-road, Watford	July 21
Alterations, etc., to Thrapston Police-station	Trustees Barnet Chancel Estate	J. C. Talem, Architect, 16, Broad-street, Stamford	No date.
High School at Parkgate-road, Watford			do.
Church Church			do.
Church House at Barnet			do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
Waterworks Plumber and Inspector	Todmorden Corporation Waterworks	Not stated	June 19
Assistant Civil Engineer	Admiralty	Not stated	June 25
Inspector of Carriages and Vehicles	Middlesex Education Committee	12s. 6d. per evening	June 29
Inspector of Builders' Quantities	do.	18s. per evening	do.
Inspector of School Bldgs. and Capt. of Fire Brigade	Swindon Corporation	120l. per annum	July 1

Those marked with an (*) are advertised in this number.

Competitions, iv.

Contracts, iv. vi. viii. x.

Public Appointments, xvi.

TENDERS.—Continued from page 663.

CHOTMELIGH.—For water supply works for the full Nelson Rural District Council. Mr. F. B. Edgell, engineer:—

E. I. Stanbury	£2,778 11 10
W. Parkin	2,506 14 11
W. Harrison & Co.	2,485 8 3
P. A. Hooper	1,968 10 0
H. Pyke	1,694 14 3
Sherr & Partners	1,587 0 1
H. Harris	1,470 16 3
E. Tabor, Cambridge*	1,311 12 6

DUNDALK.—For erecting municipal technical school, for Louth Technical Instruction Committee. Mr. M. Sallans, Engineer and Surveyor, Town Hall.

Wmns	£4,053 0 0
W. J. Camp-	
bell & Son	£3,780 0 0
Hutchinson	3,909 14 4
Keth	3,584 0 0
T. McDonald,	
Dundalk*	3,291 4 0

DYNAS POWIS.—For the formation of a new road connecting the main Barry-road with the old main road at Dinas Powis, and the construction of lanes, sewers, electric drainage, etc., for the Greenfield (Dynos Powis) Land Company, Ltd. Mr. H. Budgen, architect, 95, St. Mary-street, Cardiff:—

J. W. Hunter & Co.	£2,180 1 6
F. E. Evans	996 0 0
Meredith Bros.	947 16 0
Barnes, Chaplin, & Co.	869 17 3
W. Brown	822 19 1
G. Pollard & Co.	746 0 0
G. Butler	737 11 5
F. Ross	719 19 5
W. J. Fenn	691 13 7
A. G. Collins & Co.	676 4 7
H. Britton	671 0 5
J. Britton, Dynas Powis*	610 0 0

EBBW VALE.—For 700 yds. of 9-in. glazed stone-ware pipes, etc., at Wansgrove District, Beaufort, for the Urban District Council. Mr. T. J. Thomas, Town Surveyor, Ebbw Vale:—

J. W. Hunter & Co.	£2,180 1 6
F. E. Evans	996 0 0
Meredith Bros.	947 16 0
Barnes, Chaplin, & Co.	869 17 3
W. Brown	822 19 1
G. Pollard & Co.	746 0 0
G. Butler	737 11 5
F. Ross	719 19 5
W. J. Fenn	691 13 7
A. G. Collins & Co.	676 4 7
H. Britton	671 0 5
J. Britton, Dynas Powis*	610 0 0

J. Roberts & Co.	£448 10 8
W. Devaney	420 0 6
G. Read & Son	462 7 0
Evans & Roberts	393 0 0
National Elec-	
tric Con-	
struction Co.,	
Bangor*	432 12 0
Thames & Rye	457 10 0
Thames & Rye	444 0 0

HENDON.—For painting and repairs at workhouse, near Edgware, for the Guardians. Mr. E. P. Thompson, architect, 25, Finsbury-square, E.C.:

H. Hudgell, Brent-street, Hendon*	£315 4
J. S. WORTH.—For new secondary school for girls, for His Grace the Duke of Northumberland, E.C. Mr. H. G. Crothall, architect, The Guildhall, Westminster, S.W.:	
Blackburn	£4,271 0 0
Waller	4,045 0 0
Kinglerie & Son	4,029 18 0
Heath	3,989 0 0
Godson & Son	3,873 0 0
Dickens	3,868 0 0
Godard & Son	£3,863 0 0
Mattcock & Parsons	3,849 0 0
Minter	3,813 0 0
Wisdom	3,789 12 6
Dorey & Co.	3,699 0 0
Knight & Son*	3,433 0 0

LEAVESDEN.—For cleaning and painting work at Leavesden Asylum, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief. Quantities by Messrs. J. Leaning & Sons, 28, John-street, Bedford-row, W.C.:

G. Jaggard	£2,687 4 0
H. F. Wollaston	2,621 12 7
Holliday & Greenwood, Ltd.	1,677 0 0
S. T. Wright & Co.	1,652 1 7
R. Lees, Ltd.	1,640 19 9
Goodchild & Jeffery	1,427 0 0
Vigor & Co.	1,390 0 0
T. Cole	1,175 14 0
F. W. Harris & Co., Ltd.	1,175 0 0
J. & M. Patrick	1,146 0 0
H. Kent	1,141 0 0
Lilley & Sons	1,013 0 0
De. Proctor & Son	1,000 0 0
M. McCarthy	901 0 0
J. S. Fenn	925 10 0
A. H. Inns	906 0 0
W. J. Simms & Sons, 160, Derby-road, Nottingham*	795 0 0
W. Payne & Co. (Informal)	721 0 0

MISTLEY.—For making-up the footpaths in Oxford-road, for the Tending Rural District Council. Mr. J. Bell, Surveyor, Weoley, E.S.O.:

260 square yards concrete path at per yard.	208 lineal yards channel. With granite sets. With Scorrie brick at per yard.	208 lineal yards kerb at per yard.
J. Ellis & Sons	s. d. 6 9	s. d. 5 10
M. Reece	3 11	2 10
G. Purgoyne	3 11	3 4
B. Saunders	3 0	3 8
J. Moran & Son	2 10	3 7
Parsons & Sons, Manningtree*	3 0	3 3
Sage & Cutting	3 3	3 4

LONDON.—For the erection of new section house and married quarters at Long-lane, Bermondsey. Mr. J. Dixon Butler, Architect and Surveyor to the Metropolitan Police, New Scotland Yard. Quantities by Messrs. Thurmond, Son, & Chidgey, Charing Cross-chambers, Duke-street, Adelphi.—

Shurmer & Son .. £19,042	Holloway Bros. £18,280
W. Downs 19,735	Lawrence & Son .. 18,268
Lathey Bros. 19,455	E. & H. F. Riggs .. 18,234
Lascelles & Co. 19,325	Mowlem & Co. 18,120
F. G. Minter 18,970	Higgs & Hill 17,984
H. Lovatt 18,857	Leslie & Co. 17,672
Perry & Co. 18,800	Grover & Son 17,538
H. J. Williams 18,287	

OKENGATES (Salop).—For additions and alterations to the Primitive Methodist Church, for the Trustees. Mr. Elijah Jones, architect, 10, Albion-street, Hanley. Quantities by architect:—

T. Godwin £1,413 0	A. Roper £1,212 0
R. & J. Milling .. 1,280 0	J. Bright 1,190 0
ton 1,310 0	J. & T. Francis .. 1,088 17
J. L. Jones 1,280 0	J. Blakemore & Sons 1,081 12
C. Cornes & Son .. 1,255 0	
J. Bagnall 1,238 0	A. Holmes, Wel-
F. Holder 1,220 0	lington 1,030 0

† Accepted subject to deduction.

PARKESTON.—For making-up of the footpaths in Parkeston-road, Princes-street, Tyler-street, and Adelaide-street. Parkeston, the paths to be of concrete, and the kerbs and channels of granite or Scotch brick, for the Tending Rural District Council. Mr. J. Bell, surveyor, Wesley, R.S.O.:—

	1,177 square yds. concrete path at per yard.	750 lineal yards channel. With granite sets at per yard.	With Scotch brick at per yard.	180 lineal yards new kerb at per yard.	599 yards old kerb at per yard.
J. Ellis & Sons	s. d. 5 0	s. d. 6 0	s. d. 5 0	s. d. 4 3	s. d. 0 10
M. Reese	3 1	3 11	2 10	6 0	2 9
E. E. Newton, Harwich	2 53	4 0	3 6	3 5	0 43
G. Burgey	3 11	3 4	3 4	3 8	0 6
F. Saunders	2 10	—	3 6½	3 3½	0 5½
J. Moran & Son	2 9	3 8	3 7	3 7	1 3
T. Kedde	3 3	3 5	—	3 ½	0 6

PAU.—For the erection of a half timber and rough cast dwelling house at Pau, France, for Dr. Edwards, exclusive of stone foundations but inclusive of customs, freight, etc., and everything else, and to be erected within three months by English workmen. Messrs. Hayward & Maynard, architects, 20, John-street, Adelphi, London, W.C.:—

Humphreys, Ltd. £1,382 0	Rowell & Co. (ten- ants) .. 1,012 8
--------------------------	--

(Negotiations have been entered into with Messrs. R. Hes & Co. for the execution of the work.)

SCUNTHORPE.—For constructing a storage reservoir, pump house, offices, etc. (Water Contract No. 6), for the Urban District Council. Mr. A. M. Cobban, Engineer, Home-street, Scunthorpe:—

	Cubic yard engine-beds. s. d.
Dawson & Son £9,062 0	20 0
P. Sharp 5,255 2	20 0
Bower Bros. 4,960 0	20 0
C. Hollingsworth .. 4,972 0	19 0
Arundel's Exors. 4,800 0	15 9
H. Ashley 4,270 0	15 9
H. J. Thompson, Scunthorpe* 4,176 0	15 0
J. H. Dixon 4,100 0	20 0

[Engineer's estimate, £4,870.]

SKETTY.—For erecting seventeen houses in Town Hill-road, Sketty, Swansea, for the Sketty Co-operative Building Club. Mr. G. T. Ruthen, architect, Bank-chambers, Heathfield-street, Swansea:—

Bennett Bros. £9,000 0	J. Marles & Sons £5,567 10 0
T. Richards 7,762 0 0	W. Evans 5,625 0 0
Lloyd Bros. 7,613 9 11	T. D. Jones 5,467 10 0
J. & D. Jones 6,650 0 0	C. Marles, Richardsou- street, Swansea* .. 5,365 0 0
H. Billings 6,630 0 0	
D. Jenkins 6,500 0 0	

SALTWOOD (Kent).—For 110 yds. of 9-in. stone-ware pipe sewer, for Bham Rural District Council:—

C. J. Howland £150	S. Gower £98
O. Mart 145	Scott Bros. 86
J. J. Jenner 119	J. Reeve, Cheriton* .. 84
Lewis & Sons 98	

SWANSEA.—For erecting five pairs of semi-detached houses in Dilwyn-road, Sketty, for the Second Sketty Corporation Building Club. Mr. O. T. Ruthen, architect, Bank-chambers, Heathfield-street, Swansea:—

D. Jenkins £4,800 0	J. Marles & Sons, Fuge & Rosser .. 4,750 0
T. Richards 4,693 0	Richardson- street, yard, Swansea* .. £4,075 0
T. D. Jones 3,999 15	

SWANSEA.—For erecting a villa residence in London-road, Gorsehill. Mr. C. T. Ruthen, architect, Bank-chambers, Heathfield-street, Swansea:—

D. Jenkins £1,160 0 0	Fuge & Rosser, 172, St. Sons 875 0 0
H. Billings 840 0 0	Helen's- Swansea* .. £752 11 6

TROON.—For alterations to Wesleyan Chapel, Troon, Campore, for the Trustees. Mr. H. W. Collins, architect, Clinton-road, Redruth:—

J. Heryman, Campore* £110

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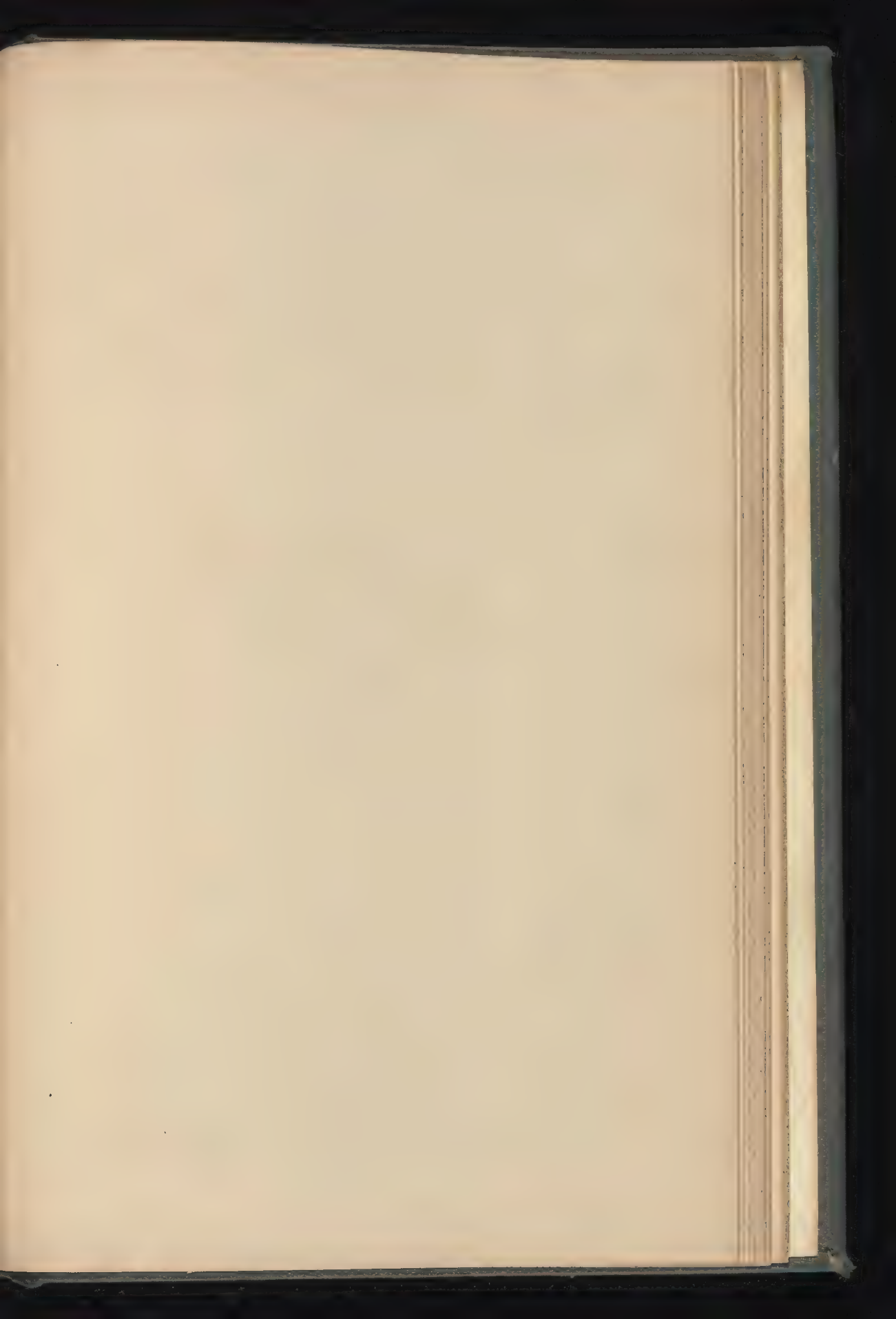
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FRONT VIEW.



BACK VIEW.

HOUSE AT CHISLEHURST.



FRONT VIEW.



BACK VIEW.

HOUSE AT GREAT SHELFORD, CAMBRIDGE

ILLUSTRATIONS.

Portrait of Sir Aston Webb, R.A.	From a Photograph.
Selected Design for Wesleyan Hall, Westminster.	Messrs. Lanchester & Rickards, Architects.
1. Perspective View.	
2. Plans.	
Sculpture at the Royal Academy: Plate 1 }	
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The Wesleyan Hall Competition Designs.



HE nine designs submitted in the final competition for the proposed Wesleyan Hall at Westminster have been on view this week at the Wesleyan church in the City-

road. The occasion is one of more than usual interest, owing to the size and importance of the building and the prominent site which it is to occupy in front of the open space opposite Westminster Abbey.

Detailed description of the selected design by Messrs. Lanchester & Rickards is rendered unnecessary by the publication of the perspective view and the plans in the present issue. The plan as a whole is a model of clear and symmetrical arrangement, successfully grappling with a very difficult problem. The library and the small hall are arranged in connexion with each other, as requested in the Instructions; the four large Committee-Rooms are exceedingly well placed, in close connexion with each other, and in the part of the building where they will be most removed from noise. On the other hand the reading-room, it must be admitted, is at the noisy corner, which is to be regretted, but it may no doubt be urged that it is a less evil for people to be disturbed by noise when reading than for them to be rendered inaudible in a meeting-room when speaking. It is, however, a question whether, for two

reasons, the reading-room and conference hall would not really have been better on the first floor; a change which might, even now, be made without much deranging the plan. In the first place this plan is one (almost the only one) in which the authors have provided something like a wide and dignified grand staircase up to the large hall. When there is such a staircase, we hold that cloak-rooms should be on the ground floor, so that people should ascend the staircase without their wraps and impedimenta; it is more dignified. Secondly, it might be very convenient, on special occasions, to have two large rooms like the library and conference hall (which is called in the Instructions the "Reception Hall") on the same floor with the large hall; so as to be able to use the whole *en suite*. Apart from this point, the cloak-room arrangements are ample and very well arranged, at either end of a spacious crush hall; there is also separate and spacious provision of the same kind in the basement, in connexion with the tea-rooms; a provision which was specified in the Instructions; and which some of the competitors have overlooked. The tea-rooms and the kitchen would not be very adequately lighted, but are very conveniently arranged in relation to each other. The planning of the large hall so as to place the platform in the centre of one of the longer sides is not, we think, the best; but it has the advantage in the present case of putting the speakers at the farthest point from outside noises; and the indentation in the plan, by which the south windows of the hall are

kept some way back from the street, though it loses some space, is decidedly in favour of quiet. The authors have not attempted to provide the suggested extra offices on the west side for letting off, as the offices in their plan are evidently those required for the business of the establishment; and in fact the suggestion was not a very reasonable one, considering that the site is barely large enough for the rooms demanded for the work of the establishment, and requires some management to get them all in: the suggestion was, however, only optional.

It may be questioned whether the authors have done their external design the best justice by taking the perspective view from a high point of sight; it has the advantage, no doubt, of showing the working out of the whole structure better, but it also shows too much of the flat roofs which are not intended to be seen, and does not give the effect of the building as it would really appear. It is what may be characterised as a "grandiose" building; perhaps a little too much so; for though it is not a church, it is what, in the phrase of the Established Church, would be called a "Church House"; it is the central establishment of what is essentially a great religious community; and in that light it has, like nearly all the designs, a too decidedly secular appearance. And one cannot help thinking that this illustrates one of the drawbacks to the system of architectural competition. We are not adversaries of the competition system for important buildings; there is, on the whole more to be said in

favour of it than against it; but it is almost inevitable in such a case that each competitor endeavours to outvie the others in producing something striking; it is a very important element in the chances of success; and what is most striking is not always really the most suitable architectural expression of the situation. Had the authors of this design been invited, without competition, to evolve what they considered the best architectural expression of a building to represent the central home of Wesleyanism, is it not possible that they would have produced something different from this—more religious and less municipal in appearance? And the remark applies more or less to the designs generally; they do not seem to us to express the true spirit of Wesleyanism; they are somewhat too Pagan in spirit.

We were not able to find room for the section, but it is almost needless to say that the visible cupola in the exterior design is not the actual roof of the great hall, but an outer one for effect, on the same principle as at St. Paul's; the actual ceiling of the hall is a segmental domed one at a much lower level.

A word on two general points, before going to the other designs. We observe that every one of the designs—we think we are correct in saying so—shows a ceiling to the large hall of curved section, segmental or elliptical. The attention of competitors was drawn to the fact that good acoustic properties in this hall were of the greatest importance; and everyone who has paid any attention to the subject is aware that, whatever is *not* known about acoustics (and that is a great deal), it is known that a ceiling in a curved section is bad, at all events for speaking, as it promotes echo. The other point is in regard to stairs. The attention of competitors was called to the requirements of the County Council in respect of stairs, as the large hall might be used as a concert-room, and therefore would come under the regulations for the safety of theatres and public buildings. These regulations demand two exit staircases for every 500 persons on each floor, providing for a minimum of width, but requiring the specified number of staircases, whatever their width. Most of the competitors seem to have been influenced by this requirement, and hence the general prevalence in the plans of narrow staircases, and the general absence of any attempt to provide a grand or monumental staircase, since a staircase of wide proportions counts for no more, according to the letter of the law, than one of the minimum width. This is an absurd anomaly, which ought to be altered. Nothing contributes more to the dignity of an interior than a spacious and stately staircase; but if its dimensions are to count for nothing, of course space cannot be wasted for it. That, we take it, is the real reason why we see in these plans such a collection of cramped and narrow staircases, quite unworthy of the scale of the building. Most of them after all, do not, as far as we had time to examine, provide the full number required; certainly the full number are not provided to the galleries of the hall in the accepted design, as it has only two exit staircases, as far as we can make out from the plan, and ought by regulation to have at least

four. But where there is a state staircase of ample width, these regulations as to mere number ought to be modified.

No. 4, by Mr. Vincent Harris, shows an exterior design treated with some power, with a strongly marked cornice and deep carved frieze under it, which is not without its effect; the angles are emphasised by masses of rusticated work, the space between being occupied on the Prince's-street side by a Corinthian order with windows between, on the Tothill-street side by ranges of windows only. The large hall, which is of ample size, has its long axis east and west, and the reading-room and conference-room in the same positions in regard to it as in No. 5. The author has provided extra offices and strong-rooms on the west side. The large committee-rooms are on the second floor on the east side; too high up. The cloak-rooms are planned in a primitive manner, the access to them being by contiguous doors out of the same corridor. There is a dome over the centre and smaller domes at the angles. The perspective view is a powerfully executed drawing, but the *ensemble* is somewhat confused and wanting in repose and unity of design.

No. 3 by Mr. Plockhart, is the most severe and restrained in exterior design of all, and in this respect to our thinking the best; we prefer it to the accepted design. There is no dome or other salient feature; it is a symmetrically treated rather low mass of building, with a Corinthian order in the centre part of each of the faces shown, on a high rusticated ground story; there is a pediment over the order on the Prince's-street side, but towards Tothill-street only the level cornice; the angles are treated in a simple and massive manner; and the whole design, though it has no more of the Church House sentiment than any of the others, is most complete and satisfactory in effect. The plan provides religiously the number of staircases officially required, without providing anything like a grand staircase. The plan is in the main a good one, but the large committee-rooms are too scattered in position; committee-rooms of this kind should be grouped, as there is often occasion for reference from one committee to another. The conference hall is, as we think it should be, on the same level as the large hall, and in a central position with a committee-room on each side of it. The plan however, in symmetry and concentration is not equal to one or two others; it is in the architectural treatment that its main superiority lies, and although the absence of a central elevated feature may be felt, the refinement of detail and conception go far to atone for this; and then there is the question of economy: it looks as if it could really be carried out within the stipulated limit of cost, which certainly cannot be said of some of the others.

No. 2, Mr. Gibson's, shows a tower with a picturesque lantern stage near each angle of the Prince's-street front, and at the angles a pavilion block with an arched pediment, which forms a "stop" to a columnar order carried along the upper part of the Tothill-street front. This is suitable and graceful in effect, but the leaded dome over the large hall, well designed in itself, does not relate to

anything on the plan; it is a made feature carried on girders, for exterior effect. In the selected design also it may be complained that the ground plan gives no hint of the dome over it, but there is more constructional basis for it than in this case. There is a lofty recessed arch carried up in the centre of the Prince's street front, to emphasise the entrance, and sculpture decoration is well put in and well shown on a large and fine detail elevation. The hall and staircase are well treated, with a stair 13 ft. wide ascending to right and left, but the ladies' and gentlemen's cloak-rooms have doors close opposite each other. The small hall, library, and reception-room are grouped together on the plan; the reception-room forms a kind of passage-room to the large hall, which is perfectly allowable, and in fact perhaps its proper use. The large committee-rooms seem too scattered—one on the east and one on the north on the second and third floors respectively; those committee-rooms should not be higher up than the first floor and should be grouped together. The large hall looks rather small for the accommodation required.

Messrs. Mallows & Cross (No. 1) send what we take to be alternative plans, though not so stated. Those on the left may be taken as impossible owing to the space wasted in large corridors and the insufficient size of the large hall. Both sets of plans are exceedingly symmetrical and stately in internal effect, and would make very fine buildings, but even the right-hand set is too liberal in corridor space considering the restricted character of the site in regard to the accommodation required. In this plan the large hall forms a Greek cross in the centre, with galleries over the recesses; the conference hall is centrally behind the platform side of the large hall; in the four angles of the plan on this floor are reception-room, vestry, and two committee-rooms, symmetrically placed. This makes an admirable pattern on the plan, but symmetry on plan does not always make the best working arrangement. If we understand the plan right, ladies' and gentlemen's cloak-rooms in connexion with the large hall are on opposite sides of the building, which would necessitate a party of men and women dividing on the ground floor and ascending separate staircases, with a difficulty of knowing how to find each other again; a practically impossible arrangement. The authors write on the plan of the hall that it gives "2,708 seats, including platform and galleries." They are perhaps stronger in arithmetic than we are, but we have failed, after careful computation, to realise more than 2,122 seats, including 170 on the platform, which we think should not be included; "to seat 2,500" means to seat an audience of that size. A hall to seat 2,500, when you come to work it out, is a larger undertaking than some of the competitors seem to have quite realised. The perspective view, a very fine drawing, shows a very dignified architectural exterior; in fact the whole scheme is architecturally a very fine one, but convenience has been rather sacrificed to architectural effect and disposition.

Design No. 9, by Messrs. Crouch, Butler, & Savage (of Birmingham), is the

only one which adopts an angle entrance, and though we do not think this the best principle of treating a plan of this size and importance, both plan and design are very clever and interesting. Inside the angle entrance is a circular vestibule, and beyond this the whole centre of the building is scooped out as a large circle; in the basement this forms the small hall, with a retiring-room taken out of it; over this is the large hall, within the same circular walls, but the platform and orchestra over the retiring-room below. It seems at first sight absurd that the small and large hall should be circumscribed by the same walls on the plan, but the system is to make up in height what is lost in area, by having two tiers of large galleries—a three-storied hall in fact. We do not think this a good practical solution, but the whole thing has the merit of presenting a distinct architectural idea, and the dome is really an expression of the sub-structure. The tea-rooms are well arranged in the basement, and the large committee-rooms over them. The conference hall and reading-room are on the same floor with the large hall, the conference hall opening directly into it, which is a good arrangement. There are inevitably some awkward corners in the plan; the cloak-rooms are rather restricted, and the small hall would be insufficiently lighted. Whether the large hall, with all its galleries, would really give the sitting accommodation required we should feel rather doubtful, but had not time to test it. The exterior is a fine design; a quadrant colonnade at the angle entrance, an engaged Ionic order in the centre portions of the two sides, stopped by solid angle pavilions with pediments over; there is a small dome marking the vestibule and a large one over the hall, both finished externally as stone domes; the aspect of the whole is what may be called monumental.

No. 8, by Messrs. Cheston & Perkin, is what we should call a commonplace exterior design, redeemed by an exceedingly practical and well-arranged plan. The stairs are small, but there are plenty of them; the cloak-room accommodation is ample and very well planned, and the areas for light well placed, so as to be of the most value to the interior. In a practical sense this is one of the best plans; but the exterior design wants character and individuality, there is no leading idea in it.


No. 6, by Mr. Jas. A. Swan (Birmingham), looks an odd plan at first sight, but has points in it, especially the grouping of the four large committee-rooms not far from the entrance, lighted from internal areas; they are thus all together, and the greatest quiet is ensured. The small hall has its own special entrance with its own cloak-rooms. The tea-rooms in the basement are insufficiently lighted, partly by borrowed light through the screens of the ladies' cloak-rooms! These and other details seem to have been got in afterwards, instead of being thought out as part of the whole scheme. The reading-room is in a good and quiet position in north-east angle. The exterior perspective, in colour, with a great effect of reflections in the wet street, shows two campaniles on the east side; the

design is of a very naive description in detail.

No. 7, by Messrs. Waddington, Son, & Dunkerley, has some good points in the plan, but is in want of a controlling motive; as in the last-named, things seem to be got in because they must be got in, not because their position has been thought out as part of a definite scheme. The committee-rooms are grouped on the north side, which is a quiet quarter; and the reception-room and conference hall well placed over the vestibule; but the "centre lounge and memorial hall" are not wanted, and the treatment on the plan of partitioning off lavatories and other rooms in the angles is the last kind of treatment for anything which is to be called a memorial hall; it is essentially un-monumental. The exterior is a domed structure more ambitious than satisfactory.

There can be no doubt that the best plan has been selected, and the exterior design will make a fine and effective building, though, as already implied, we can hardly regard it as the ideal architectural expression of the central Institution or Church House of a religious body.

SCULPTURE AT THE ROYAL ACADEMY.

S with the pictures, so with the sculpture at the Royal Academy—there is no one work that one can single out as being especially great and as the predominant production of the year; yet the proportion of really interesting work is much higher in sculpture than in painting. This is perhaps not surprising; sculpture is a very exacting art, and (in England) not a popular one; and there is no encouragement to enter upon it lightly.

Portrait statues are prominent; Mr. Pomeroy's bronze figure of Lord Dufferin occupies the central position in the Octagon, and is treated with dignity, a ceremonial mantle giving the opportunity for breadth and mass of effect. Mr. Thornycroft's colossal bronze figure (also cloaked or gowned) of Mr. Gladstone, which is to be erected in the Strand near St. Clement Danes, stands opposite to a very pleasing and finely composed group entitled "Brotherhood," which is to form part of the same memorial; the brotherhood being represented by two little nude boys standing at their mother's knee and partially embraced by her; the lines made by the seated figure, and the grouping of the three heads, form a charming sculptural *ensemble*, and one cannot but wish that the monument had been limited to this symbolical group backed by a stele with the portrait head of Gladstone, instead of the entire figure on a larger scale than that of the group. Bronze, however, does far better than marble for a portrait figure of this kind; marble is for more idealised work, and we would much rather have seen Mr. Frampton's figure of Sir Antony MacDonnell in bronze than in the marble as it stands in the Lecture-room. But all portrait figures of this class are beside the real genius of sculpture. Mr. Goscombe John has in the Lecture-room a sketch model for a bronze seated statue of Mr. Lecky for Trinity College, Dublin, which we suppose is to be carried out life-

size or larger. Mr. Lecky was a rare and remarkable intellect, but what could be made of his figure in sculpture?

Among works specially intended as parts of a decorative architectural scheme, the most important is perhaps Mr. Mackennal's figure of "Glory" for the Islington war memorial (see G, lithograph plate No. II.); a figure fine in attitude and in the design of the drapery, but the expression of the head is surely rather tame in relation to the idea symbolised. Mr. Walker's monument to the Marchioness of Lothian, and Mr. Schenck's two admirably decorative reliefs, "Literature and Art" and "Science and Industry," have already been illustrated in our pages; they are to be seen on the north wall of the Lecture-room, where also is a very interesting sketch model for a frieze in bronze—"Peace and War," by Miss Marvon; the two sides of the subject are divided by a kind of pavilion or gateway enclosing a group of figures which may symbolise the central life of the state or city; at any rate the effect of the whole promises very well. Mr. Drury's panel "The Fine Arts," for the Victoria memorial at Wellington (New Zealand), is an excellent piece of architectural decoration, the draped figures in low relief, the heads being detached in rather higher relief from the ground. Mr. C. J. Allen's sketch model of a figure of "Justice" (E, Plate II.), for a group on the Liverpool Victoria memorial shows a most satisfactory simplicity and breadth of treatment. Another Victoria memorial, for Nottingham, has furnished Mr. Toft with occasion for a charming work symbolising "Maternity," a panel showing a draped figure in relief holding a charming little child on each arm (perhaps there is a little too much of the suggestion of "twins" about it); the heads are relieved against a background of twined foliage; the whole is slightly mediæval in spirit, and in this sense an interesting variety from the usual character of modern work of this kind. Mr. Hodges's large group "The Flow," for Cardiff Town Hall (is there to be a corresponding group representing "The Ebb"?), is a mass of marine figures and attributes falling in with a long-accepted convention, and which will probably have a good effect in its place on the building; for an exhibition-room it has not enough subject for the space it occupies. The principal head, which is finely treated, seems to owe something to a remarkable clay model for a River-God in the South Kensington Museum, attributed to Michelangelo. Mr. Goscombe John's "Dettingen Drummer-Boy," a model in plaster and over life-size, is also out of place in the confined space of an exhibition-room; it is to be executed in bronze as a part of a memorial to the King's Liverpool Regiment, and in that position and material will be very effective. Coming to the sculptures which are neither portraiture nor decoration, but are ideal subjects complete in themselves, we find in Mr. Parker's "The Long, Long Dreams of Youth," which is the first exhibit on the Catalogue, a nude figure very well modelled and with a face very expressive of the idea intended, only the face and the attitude hardly go together; the attitude is not reposeful enough for a day-dream. Still, this is a work of the

type we like to see; the abstract expression of sentiment by an abstract figure, with no realistic accompaniments; it represents what sculpture was meant for. So does Mr. Bertram Pegram's group "Endymion," a rather new treatment, for Endymion is rising up to meet Diana's kiss; the insistence on the anatomical detail of his figure perhaps rather disturbs the mood of the work; a Greek would have conventionalised more and thus kept a more poetic atmosphere. Mr. Taubman's "The Awakening" (A, Plate I.) is more abstract—a fine calm sculpturesque figure. Mr. Derwent Wood's crouching figure of "Cain" is unquestionably powerful, but the features are of an unnecessarily low type which it is disagreeable to contemplate; remorse may be intended, but if so it is not successfully expressed. Mr. Mullins's "Sisters" and Mr. Arnold Wright's "Sleep" (B and C, Plate I.), which find place on either side of the door leading to Gallery VI., are both very charming examples of the sculptural expression of a simple idea; Mr. Mullins's group is especially well composed. Mr. Henry Pegram's "Into the Silent Land" and Mr. Nicholson Babb's "The Victim" both rather want repose of line; the former is not quiet or calm enough for the expression of the solemn little poem (Longfellow's translation from Salis) which gives the title to it. Mr. Babb's figure is really an Andromeda—at least that is the situation; an Andromeda whose figure is contorted with terror. One can understand the desire to give some intensity to the treatment of a rather hackneyed subject; it is an illustration of the great difficulty of doing this in sculpture without overstepping the best conditions of the art.

Of the works occupying the centre arc of the Lecture-room a good deal of interest attaches to Sir W. Richmond's figure which presents a new conception of Homer (F, Plate 2), not as the grave aged bard with a venerable beard, but as "The Young Minstrel." The sculptor takes us back to the Homeric age by the conventional treatment of the dress, in the rigid straight

folds characteristic of archaic Greek sculpture, and by the pedestal designed in form of an archaic Ionic capital. The conception is novel and the work interesting and pathetic, but it suggests a question; assuming the individuality of Homer (which for our part we are disposed to believe in), can we believe that the poet who, in describing the actions of men, and the aspects of nature, and the decorations of armour, etc., gives us such an impression of seeing the thing, was already blind in youth? Is it not a more probable conclusion that he was blind only in advanced years, and described thus vividly what he had seen with his own eyes in earlier life? Mr. Mervyn Lawrence's "Hebe" is a fine female figure; is the curve of the left hip somewhat exaggerated, having regard to the position of the legs? Mr. McGill's "The Herald Talthybius" is a fine male figure; any other title, it is true, might fit it, but it is a good piece of sculpture. Between these are two small works which show more of intellectual interest. Mr. Reynolds-Stephens's "Guinevere's Redeeming" is a statuette in bronze with ivory face and hands, representing Guinevere as abbess; the base is a decorative design with four small alcoves enclosing little figures symbolical of her previous history; what gives interest to the principal figure is the true instinct with which the artist has shown the queenly manner and expression still evident in the religious garb. The other work we referred to is Miss Esther Moore's "The charmed circle of Youth," a really poetic little work which may suggest different meanings; it shows a small winged figure reclined on a circular pedestal and partly shaded by one wing which forms a kind of canopy over it; one hand holds a cornucopia which hangs outside the edge of the disk pedestal. It is a very charming and fanciful conception.

Mr. Lynn Jenkins's graceful fountain in marble and bronze we have already illustrated. Among other things to be noticed in the Lecture-room are Mr. Hartwell's very expressive female head called simply "A Study"; Mr. Hope-Pinker's graceful bronze statuette, "Reverie" (D, Plate I.); Mr. Lucchesi's

powerful bronze head of a monk, "L'Eremita"; Mr. Swynnerton's "The Offering," a bust of a young girl with a beautiful head, who holds up a basket of fruit and flowers—there is a Greek title on the pedestal, but the head is not Greek in character; Mr. Oliver Wheatley's small allegorical work "The Human Task," a man rolling a ponderous wheel; Miss E. M. Rope's charming little frieze of children and dolphins, called "A Race through the Surf"; Mr. Halnon's finely conceived and expressive bust of the god of "Hypnos"; Mr. Alfred Drury's "The Spirit of Night," a work of somewhat similar feeling though different in type; and Miss Florence Steele's charming "Rose Bowl" in silver.

Of some of the works mentioned but not now illustrated we shall be able to give illustrations in another issue. Ordinarily we have found some difficulty in collecting adequate illustrations of the sculpture; but this year our sculptor friends have been so kind in their response to our request that we have more illustrations than we could find space for in one issue: but those not now printed are not overlooked.

NOTES.

VARIOUS residents in Glasgow, who are interested in architecture and in Glasgow Cathedral more especially, have seen with anxiety the proposal to remove Robert Adam's building, the Royal Infirmary, which stands close to the Cathedral, and substitute for it a much larger and loftier building in a Scotch Castellated style, which will out-scale the Cathedral. A committee has been formed to protest against this procedure, and they have sent us the accompanying diagram, which shows (in the unshaded portion) the outline of the present Royal Infirmary, and that of the building which it is proposed to erect in its place. Of its injurious effect upon the Cathedral there can be no doubt; and what we should deprecate just as much is the demolition of Robert Adam's building. If more infirmary accommodation is required,



Glasgow Cathedral and the Proposed New Infirmary. (The unshaded portion shows the outline of the present Infirmary.)

cannot they build another Infirmary on another site, instead of destroying one of Glasgow's most interesting buildings and permanently injuring the effect of the Cathedral? It is a very serious thing to do, and if recognised afterwards to be a mistake, it cannot be undone.

The Isle of Wight Coast.
water Bay. THINGS move very slowly in the Isle of Wight with regard to coast protection at Freshwater Bay. The local authorities seem to persist in their refusal to take any steps for safeguarding the land unless with the co-operation of the county council and private owners. It is wonderful how poor local government bodies are when necessities and not injuries are called for. At present the position is that a joint committee of public authorities and private land owners are considering the best means of carrying out works for the protection of Freshwater Bay from further encroachments of the sea. It is now thought desirable to extend the scheme so as to provide a harbour for yachts and other small craft. No doubt accommodation of this kind would be very acceptable, but the first thing is to avert the imminent danger that the island will be cut asunder by the next severe gale. We think it a pity that attention should be diverted from the main issue. This larger scheme will most probably cause delay, and we shall not be at all surprised that nothing will be done for safeguarding the coast until another winter has come and gone.

Landlord and Tenant.
 In our issue for December 3 we commented on a case (Woodall v. Clifton) which involved a question of considerable importance to lessees of real property. This decision has just been affirmed by the Court of Appeal, and we would again draw our readers' attention to the point. Two leases of land, each for terms of ninety-nine years, contained clauses giving the lessees the option of purchase at a named price per acre at any time during the said term. These leases were granted respectively in the years 1867 and 1869, and having both become vested in the plaintiff, he now sought to exercise his option of purchase. It has been decided that such an option cannot be exercised, since it offends against the law of perpetuities, viz., the rule of law which prevents any executory interest coming into force later than "a life or lives in being and twenty-one years afterwards." A legal distinction exists between this option and an option to renew, since the latter "runs with the land," whereas the former is something wholly outside the usual relationship of landlord and tenant. With such legal technicalities we have nothing to do, but we only would warn the lessees or assignees of long leases of improving properties not to congratulate themselves upon having a "soft thing" until they have mastered the intricacies of the law of real property relating to perpetuities and covenants running with the land.

Building Conditions.
 FROM a case decided in the Police-court last week it appears that builders who are developing estates under conditions imposed by the London County Council cannot evade the conditions, relying on the Council's apathy in enforcing them.

In the development of a certain building estate a condition had been imposed that the proposed streets should be defined by posts and rails. This condition was imposed in 1901. One year later the Council wrote drawing the attention of the builders to the fact that they were infringing the condition by merely using pegs, but it was only at the commencement of this year that the Council took legal proceedings, and many of the streets were then fronted by houses. The builders relied on the evidence of experts that the delineation of streets by pegs was the common practice in London, and also on the *laches* of the Council in taking no proceedings. The Magistrate found that the practice of using pegs was universal, but that nevertheless the Council had power to impose what conditions they chose, and had given neither express nor implied permission to the builders to deviate from the condition. He, however, imposed a nominal penalty, and left each party to pay his own costs. The case appears to furnish the ratepayers with as much food for thought as the builders, and they may well ask for what end were the costs of this litigation incurred.

Port Colborne Harbour Works.
 SITUATED at the Lake Erie end of the Welland Canal, Port Colborne is destined to become a place of much importance. With the object of providing the necessary facilities, the Canadian Government are now engaged in the construction of new docks, channels, and two breakwaters. The breakwaters, one 5,000 ft. long and the other 24,000 ft. long, are nearly completed. In a general description of the works, read by Mr. J. M. Hogan before the Canadian Society of Civil Engineers, some useful details are given of the methods adopted in making large concrete blocks for the harbour walls, the construction of the timber moulds being fully described and illustrated. Owing to difficulties in the way of providing a site on land for concrete-making plant, it was decided to install the necessary machinery on a large lighter covered by a rectangular platform. This arrangement was very convenient, because the works could easily be approached by water. The plant included a derrick with an 88-ft. boom, concrete-mixing stone-crushing machines, engine and boiler, a pump providing water for the concrete, and storehouses for sand and cement. The materials for a day's work were loaded up each morning and the lighter was towed to the required point. Stone was generally obtainable from heaps close to the concrete moulds, where it was deposited by dredgers employed in excavating the channels, being hoisted from the heaps by means of the derrick. The concrete-mixer moved on a short track, and both of these could be removed from the lighter and set up on shore within the radius of the boom when required for laying the slab covering of docks. This floating concrete plant seems to have been very compact, and is said to have given very economical and satisfactory results.

The New Amsterdam Theatre.
 SOME interesting features are to be found in connexion with the design and erection of the New Amsterdam Theatre in New

York, owing to the unusual height of the columns, and the long spans of the girders supporting a roof garden at the top of the building. In this part of the construction the most noteworthy member is a plate girder 83 ft. long by 12 ft. deep crossing the auditorium at a height of 75 ft. above foundation level. This girder, which weighs 37½ tons, was delivered in sections and rebuilt in position upon timber falsework very much like that employed in bridge building. Two other roof members have open webs, and are 55 ft. long by 10 ft. deep. These, weighing 12½ tons each, were hoisted into position by means of a 20-ton derrick. Several other girders weighed over 10 tons each. The total weight of structural steel in the columns and girders is about 1,360 tons. It is somewhat curious to learn that, with the exception of the heaviest members, all the steelwork was made in Belgium. We do not often hear of foreign competition in the United States.

Motors for Traction Work.
 IN *Technics* (which arrived too late for our usual notice under "Magazines and Reviews") there is an article by Mr. L. Calisch on single phase alternating current railway work, which is well worthy of careful study by electricians. As long as only direct current can be used for traction we must use low pressures, and over considerable distances the enormous cost of mains and sub-stations becomes prohibitive. If, however, alternating current can be utilised the range of economical working is greatly extended. During the last few years, therefore, many of the ablest electricians have devoted themselves to perfecting the single phase alternating current motor. So rapid has been the development of this new type of motor, and so many modifications of it are in actual use, that it is difficult even for the specialist to keep abreast of the latest advances. For this reason we welcome an article by one who not only has had practical experience of alternating current traction work in America, but has also the thorough technical training which enables him to classify all the various types of motor in a thoroughly scientific fashion. He shows how the compensated series motors are related to one another, and gives interesting practical data showing the efficiency of the running of the "General Electric" motor on direct and alternating current circuits. In the State of New York the electric line which runs through Schenectady is actuated by direct current over the four miles within the limits of the city and by alternating current outside these limits. The motors work with either kind of current, and we were interested to note that the motors were more economical when worked with direct current. This is in accordance with theory, but at the recent discussion on motors at the Institution of Electrical Engineers this point appears to have been overlooked by several of the speakers.

Magnetic Alloys.
 In a paper read to the Royal Society on June 8, Dr. Fleming and Mr. Hadfield give the results of an exhaustive series of tests that they have carried out on magnetic alloys prepared by Dr. Heusler.

The striking peculiarity of these alloys is that no iron is used in their composition. They are made from metals which are absolutely non-magnetic, and consist mainly of copper, manganese, and aluminium, with a slight trace of lead. By melting these unpromising materials together Dr. Heuser obtains an alloy which is comparable, so far as its magnetic properties are concerned, with cast-iron. The authors prove that these alloys can be made into permanent magnets, and that when they are subjected to varying magnetic forces they exhibit that lag between the applied force and the effect produced by it, called by Professor Ewing hysteresis, which has hitherto been supposed to belong exclusively to the magnetic metals iron, nickel, and cobalt. This discovery has led the authors to conclude that magnetic properties are most probably due to a special grouping of the molecules, and hence it may be possible to construct alloys which are as magnetic or even more magnetic than iron itself. In this connexion it is interesting to note that the German Reichsanstalt has recently published some tests on an alloy of a slightly different composition from that experimented on by Dr. Fleming. Their results show that for small magnetising forces the alloy is more magnetic than cast-iron, and so the possibility predicted in the Royal Society paper has already occurred. The drawback to the commercial application of this discovery is that these alloys have poor mechanical properties and cannot be forged. We hope that this difficulty will soon be overcome by inventors. The Reichsanstalt states that one of the alloys they experimented on, containing 68 per cent. of copper, 20.5 per cent. of manganese, 10.5 per cent. of aluminium, and 1 per cent. of lead, could be worked easily. They also found that the magnetic properties of this alloy improve rapidly with time, soon becoming practically equal to those of cast-steel.

We have received a paper on "The Training of Craftsmen," by Mr. E. L. Bates, and published by the Twentieth Century Press, which was recently read before the Building section of the Association of Teachers in Technical Institutes. It is a suggestive and interesting lecture, and points out clearly that at the present time the technical teaching of an apprentice is neglected by an employer who regards him merely as one of the staff. We have doubt if this can be avoided, since the tendency of English technical education, so far as regards practical work, is to let the learner pick up his knowledge for himself. It is the same all through the professions. A suggestion by Mr. Bates is that a youth during the last year of his attendance should "pay a weekly visit to workshops and works in progress in the company of the employer." It is easy to see that such visits would be by no means welcome to those engaged in work, since visits of outsiders usually interfere with the progress of work. Nor is the occasional inspection of machinery or works in progress of any special value, for there is not that constant movement before the eyes and mind which is so essential. That technical schools or other institutions should have simple workshops

attached to them so that theory and elementary practice may go together is clear, but we doubt if at the present day any closer connexion between theory and practice is possible.

Art for Schools Association.

THE Art for Schools Association is doing a good work in its endeavour to educate the taste of children in elementary schools by placing in their classrooms good prints and photographs of beautiful and interesting works of art. Each year the Association is pledged to reproduce facsimiles of works of art of three kinds—historical subjects, studies of natural objects, and reproductions of standard works of old masters. Copies of these publications are given to annual subscribers in return for their subscriptions. At the annual meeting last week it was reported that the Association had sold 3,397 pictures in the year 1904, as against 2,771 in 1903. There had been in the year an increase of 50l. in the income of the Association through the sale of its own publications, which is the source of income to which it must ultimately look for independence. Fresh annual subscribers are much needed to help forward the work of the Association. The works published each year are admirably selected, and the importance of accustoming children from their earliest days to the appearance of works of art cannot be overated.

Tempera Pictures at the Carfax Gallery.

At a first glance it would seem that the revival of the method of tempera painting, as illustrated at the Carfax Gallery, is intended also to be a revival of a rather archaic style of art, a kind of new Pre-Raphaelite movement: certainly there is a very archaic or early Renaissance appearance about most of the pictures exhibited. This, however, may be, in some cases at least, not so much intentional as the natural result of a method which is rather intractable and does not admit of depth of shadow—which, as remarked in the preface to the catalogue, "never forgets its surface." Thus the small landscapes or architectural scenes shown by several exhibitors, many of them very charming in their way, have on this account the naïve appearance of an early and childlike art; they are decorative effect rather than nature. Mr. Southall's "Fishermen's Cottages, Anglesea," with the little white-sailed ships looking as if inlaid on the surface of the distant sea, has the quality of an illumination rather than a picture. The purity of colour which can be got by tempera is beautifully illustrated in Mr. Batten's "Mother and Child," a kind of Madonna picture, where the exquisite blue of the mantle is in itself quite a delight to the eye. His "Atalanta and Milanion" has far too much of acted mediævalism about it, but his "Danæ" is a new and interesting reading of the legend—an attempt to put into it something more spiritual and less sensuous than the Pagan conception; it is in fact more mediæval than Greek in feeling, but it is a beautiful work. Mrs. Stokes's "Snowdrop" in her glass coffin, with the quaint little dwarfs in their red hoods looking at her, is another very charming conception. Of Mr. Walter Crane's

"Briar-Rose" triptych we confess that we prefer the gesso design on the doors to the picture inside. Sir C. Holroyd's "Nymphs by the Summer Sea" is a fine design of classic type; and Mr. Cayley Robinson's "The Deep Midnight," though rather *outré* and the figures certainly not beautiful, is a remarkable and powerful conception, rather recalling the spirit of Blake. There is enough in the exhibition to show that tempera is worth revived attention for its special qualities of effect, only we would prefer to see it treated in a more modern spirit than is shown in some of the principal works here. We are not Early Renaissance, and it is no use playing at it.

Offering Commissions to Architects.

THE system of insulting architects by offering them commissions to use one's commodities seems to have reached its climax in the almost incredible impudence of the enclosed circular issued by a manufacturing firm, and forwarded to us by several indignant architects to whom it had been sent:—

"May we ask you to accept one of our pattern books for this season, with a view to mentoring our productions being specified?" Upon hearing in the affirmative we shall be very pleased to send a book carriage paid, and can offer a liberal commission over and above the builders' discount for the privilege of the introduction to your client, the builder. This we are enabled to do because it saves us the expense of a traveller to solicit orders."

The italics are our own. No comment could add anything to that.

ARCHITECTURE AT THE ROYAL ACADEMY.—IV.

THERE are nearly two hundred and forty exhibits crowded together in what is known as the Architectural Room at Burlington House, mostly very small drawings, and until the art of architecture receives greater recognition by the members, chiefly painters, of the Royal Academy it is hopeless to expect more space, and consequently, greater encouragement, in larger design for the annual public exhibition of the works of British architects.

Nothing bears out these facts more than that only two models are shown in a great art which is essentially dependent upon the use of models for an adequate conception of the designs in the absence of the actual works themselves. We have already noticed the more important of these two exhibits; the other one is an exceedingly careful model of a large house, "Barnett Hill, near Guildford" (1643), designed by Mr. Arnold Mitchell. It is substantially a Georgian design, and all the materials and joinings are very minutely indicated. There are many breaks in the lines of the plan, but the roof is simply contrived. It would have increased the interest of the model if a sectional part of some of the best rooms had been visible. The stone-built entrances, which are carried through to the main cornice, are very good features, and the plan is a distinct aid to the appreciation of the scheme. Of the remaining designs for houses mention should be made of No. 1524, "House, Addison-road, Kensington," by Mr. Halsey Ricardo. The water-colour drawing illustrates a corner of a large four-storied residence, although there is nothing to indicate its full extent or what portion is thus shown. At the first glance, the influence of an Italian villa is felt, where in the elements consist of a ribbed roof of green material, large eaves cornice terminating an "attic" story, while an arcaded and pilastered order, embracing the two principal floors, stands upon a massive base, in which the offices are evidently located. Stone appears to be the material used in the architectural features, but the whole of the walling, in which the sash windows are placed, is faced in glazed bricks of various colours, which further suggests that the whole of the solid material is probably glazed. With that in view, the design, when

executed, will, we think, have much merit, and is an idea which should receive general notice. But there is a feeling that the "applied" character of all the interests of the design is a weak element, and that the process of clothing a London house with Renaissance details is strained. There is interest, however, in the shadow effects. Mr. S. K. Greenlade's "House at Caversham" (1520) is a charming idea for the arrangement of a building with two street frontages forming an acute angle. The walls are set direct upon each street line, and an entrance gate placed at the apex of the site, leading to a raised courtyard, where a fountain is to be seen. The dwelling itself has an L-shaped plan, with two small wings reaching towards the gateway. Some skilful planning is indicated, and the bird's-eye view suggests a very interesting stone-walled and tile-roofed residence. "House at Bainbridge, Yorks" (1444), by Mr. H. Raine, is a vigorous brick and rough-cast design, shown by a good drawing, and Mr. Lander's "Nurses' Home, Canning Town" (1457) is broadly and simply expressive of its purpose. "Colshaw Hall" (1586) is a house which in certain particulars is Tudoresque, and has many good points, but the absence of a plan prevents our pursuing Messrs. Douglas & Minshull's intentions beyond this. The latter remarks may be applied to "House on Dartmoor" (1602), by Mr. A. W. Jarvis, which is a well-restrained design externally, honestly showing the local influences of site and material.

There are two street fronts from Harley-street. No. 1442, by Messrs. Niven & Wigglesworth, is a stone facade, and a distinct change in the usual types of re-buildings now so numerous on this estate. There is a quiet restraint in the design, to which the drawing does scant justice. Mr. W. Henry White is the author of the other front (1502), which is built in brick and stone, and has a flat-carved bay and ornamental gable. Mr. White is also represented by "No. 32, Cavendish-square" (1609), a front built entirely of stone. The roof is here marked by a steep pediment, the bay-window is central, and there is a French Renaissance influence in much of the detail. The balcony is extended to the full width of the site, and the segmental hood of the entrance is repeated over an ordinary window without any modification of detail, to carry the balustrade. These three drawings convey impressions of what is typical of London street designs. In no case is a plan shown, so that no opportunity is given for studying internal arrangements, which is really where variety is to be found. No. 1479 is, however, in the nature of what we are in search of; for it comprises "alterations and rebuilding of stables to No. 95, Sloane-street," by Mr. Ambrose Poynter; and it is seen that the house is small, that the stables are converted into a "pavilion," and the two are connected across the intervening garden by a covered corridor. The scheme is well rendered by a plan and three-tinted scale elevations, while the design is quiet and interesting.

There is a lack of blocks of houses in this exhibition, and, indeed, only one drawing has any importance. "Four Houses in Saffron" (1609), by Mr. B. A. Ponlter, is an exceedingly well-worked-out idea, although the houses are made to appear as one building. Bricks of various colours for the walls and tiles for the roofs are the materials in use, and the design is reminiscent of an XVIIIth century almshouse. The planning is of considerable merit, while the scheme is shown in an interesting way by plans of the site and of two floors, together with a scale elevation. No. 1616 is a very good indication of what large blocks of residential flats may be made. Here is an unusual opportunity of producing an important work, and the architect, Mr. E. W. Mountford, has seized it and made an imposing building, with three good street frontages. No plans are given, but shops are arranged on the ground story, while the suites occupy the five upper floors. Rusticated and pedimented breaks terminate each facade, and an order, which appears to be too small, is placed in the intervening spaces, the cornice of which runs round the whole building at the fourth-floor level. Stone is apparently to be used throughout, which, in combination with the large Mansard roof,

ensures dignity to the scheme, and will, we hope, have far-reaching effects upon the future buildings in Sloane-square.

House interiors are few and not very extensive. "The Hall, Minterne, Dorset" (1529) is part of a house of which two views of the exterior were exhibited last year. The drawing shows a plaster barrel vault, intersected by arched openings, and there is an oak staircase, with gallery screen, at the end of the chamber all in good character. An interesting inch-scale drawing of an "Open Fireplace, etc., Dining-room, Halford Manor" (1600) is contributed by Mr. V. J. Cummings. Notes of materials are made upon the respective parts, and we see that the chimney-breast is carried to the full height of the room in Hopton Wood stone; the mantel is also in stone supported on green marble columns, the fireplace faced with glazed tiles, and above the cornice are bronze bas-reliefs in panels. On either hand of the chimney an oak-panelled dresser is usefully arranged, and the whole idea, as well as the method of expressing it, is most excellent. No. 1448 and 1467 are interior views of conceptions for a dining-room and an entrance hall, respectively, of which Mr. L. Wybird is the author. A heavy character is put into the work, which neither in detail nor in plan suggests comfort and convenience. Colour plays a prominent part in the designs wherein tradition is severely absent. "An Arab Hall at Assuan" (1451), by M. Henri Favarger, is an unusual style, but an interesting subject of a Moorish character. The drawing is, unfortunately, hung too high to allow of careful examination.

Business premises have fair representation in the exhibition—chiefly banking premises. "Messrs. Stuckey's Bank, at Bristol" (1410) is shown by an attractive drawing indicating a strong English Renaissance feeling. The authors, Messrs. Drake & Pizey, introduce a large pedimental order, which marks the residential more than the business part of the premises. The broken segmental pediment in the main gable is not satisfactory, but otherwise there are many good points in the work. No. 1427 is "Barclay's Bank, Chelmsford," by Mr. Arthur Blomfield, which has a very tastefully designed brick front, with a two-storied pilaster order, full of good Georgian detail. The ground-floor windows, although presumably lighting the bank, are similar in detail to those of the living rooms above, and are expanded to provide adequate light; they are thus too large in scale, and some other form would have been more satisfactory. But in general respects the design is well suited to the business of a provincial town. Another bank, and of modest pretensions, is No. 1428, to be built in Hull from Messrs. Walsh & Nicholas's drawings. Amongst other good points may be mentioned the recessed third story. "The Royal Horticultural Society's Exhibition Hall and Offices" (1413) is an important work, designed by Mr. E. J. Stubbs, and is no doubt specially contrived to suit the demands of this institution. It is self-evident that the offices are in front and the hall behind, but there is nothing to indicate the internal planning or any information to convey some meaning to the external expression. The work would gain considerably with a larger roof. No. 1508, "Shipping Offices, Cockspur-street," occupies one of the finest sites in London. Being placed upon Crown property, the building had to comply with the restriction of reproducing the cornice and other features of an order on the fronts of the Club and Medical Society's buildings facing Trafalgar-square—a meritorious idea. In adapting his offices to these conditions, Mr. H. Tanner, jun., has done well. "New Stock Exchange, Manchester" (1549) is the work of Messrs. Bradshaw & Goss. Although shown without a plan, it is a solid-looking stone building, somewhat lacking in dignity. As there is no information as to the nature of the respective parts of the design, the absence of some central interest is not readily understood. No. 1538, "Royal London Friendly Society's New Premises," by the same architects, is a much more flexible and free treatment of a tall building on a corner site. But, again, there is no information as to the arrangement of the accommodation. In view of the great height, the design is one of considerable interest and merit.

A very tall, narrow front is "Whitehall

House, Charing Cross" (1573), which completely dwarfs the adjoining premises, also the work of the same architects, Messrs. Treadwell & Martin. The height is accentuated by the long vertical lines of the moulded piers, terminating in open turrets. The oriel window and the main roof treatment are admirable features in a strong piece of stone design.

"Courier Buildings, Dundee" (1631), we imagine to be newspaper offices; as such, they are favoured by an excellent site. Messrs. Niven & Wigglesworth have taken full advantage of the opportunity thus afforded, and have produced a splendid design. The motif is that now prevalent in public buildings, but, beyond the main cornice and the two-storied rusticated base, there is an entire absence of regulation features. Piers, three stories in height, are prominent in the upper part of the fronts, and there is throughout an interesting variety and refinement of detail. "A Livery Hall for a City Company" (1435), by Mr. L. G. Detmar, is an excellent scheme in the distribution of brick and stone materials. The dining-room is well expressed on the main front by three large oriel windows, while a massive character to the wings is given by flat arched recesses containing figures.

Several schools of some importance are to be seen. No. 1417, "Royal Grammar School, Newcastle-on-Tyne," is hung beyond the reach of ordinary vision. We, therefore, refer our readers to the *Builder* of July 23, 1904, when we published Messrs. Russell & Cooper's successful design. A competitive scheme for the same subject (1635), by the late F. W. Bedford, shows a greater development of the central building, and is, in many ways, a fine architectural conception. Two proposals are shown for the new "University College School, Hampstead." We published the selected scheme (1581) in our issues of January 28 and February 4, 1905, and gave at the time a detailed criticism. Although the view here shown is only an outline suggestion, there is sufficient to show, as we said before, that the design, both in plan and external appearance, is one well suited to the requirements of the institution. Although Mr. F. M. Simpson approaches the same subject from another standpoint (1462), his rendering of the problem has much that is dignified.

The most important exhibit of this nature is, however, "Buildings for the Faculties of Arts and Fine Arts for the University of Liverpool," by Professor C. H. Reilly. Here is a large rectangular block of buildings, upon an island site, with a long, narrow internal court, from which rise two large domed towers. There is great breadth and interest in the treatment of the facades, which, generally speaking, comprise a two-storied rusticated base, a large colonnaded order, and a deep attic. The building lines are slightly broken by projecting pavilions, and external staircase approaches are prominent both on the inner and outer fronts. The scheme is represented in a sketch state, and, although the bird's-eye view does not agree with the other drawings, and the court is rather narrow for its height, there is ample to show that this will be a worthy addition to the great works of architecture in Liverpool.

"The Working Men's College, Camden Town" (1429), by Mr. W. D. Carbe, has many interesting features, and is a good brick building, likely to promote a proper influence upon the minds of its occupants.

No. 1415 consists of two internal sections of "The Scala Theatre, Fitzroy-square," upon which we gave our impressions of the actual building on December 17, 1904. As we then said, this is an important advance in theatrical design. The refined architecture of the stone-faced walls, the absence of unrestrained gilt plastering, the arched proscenium opening, and the staircases connecting the dress circle and stalls are welcome departures from the chaotic state into which London theatre interiors have fallen. This condition of affairs somewhat accounts for the absence of designs for playhouses from the Academy exhibitions, so that the hanging of this design is a hopeful sign. Unfortunately, no plan is given, and the drawing cannot therefore be expected to arouse that amount of interest which would otherwise be the case.

There is very little colour decoration beyond that to which reference has already been made. No. 1454, "Bay of North Side of Christ Church, Bristol," is a fine piece of Italian Renaissance decoration, by Messrs. Murray & Seddon, shown in a charming drawing, possessing great interest in detail and colour. No. 1596 is a good wall panel in tones of red, by Mr. T. R. Spence, representing "October." It is echoed at the other end of the room by "Madonna and Child" (1465), the work of Mr. W. Dacres Adams, and is a charming rendering of this beautiful sentiment.

Stained glass is meagrely contributed, and only the works of Mr. Alexander Gascoyne possess much merit.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Royal Institute of British Architects was held on Monday at No. 9, Conduit-street, Regent-street—Mr. John Belcher, A.R.A., President, in the chair.

The minutes having been taken as read, members attending for the first time since their election were formally admitted, including Mr. J. J. Shannon, R.A., as an Hon. Associate.

The Royal Gold Medal.

The presentation to Sir Aston Webb, R.A., of the Royal gold medal then took place. The President said that it was his good fortune that evening to conclude his year of office in a way that afforded him an especial pleasure. Surely no President could desire anything better than as his last official act in the session to be called upon to confer high honour upon an esteemed friend and colleague. The Royal gold medal which he was to present to Sir Aston Webb was a distinction conferred by His Majesty the King on the unanimous recommendation of Sir Aston's brother-architects. For him (the President) to point out how this great honour had been won, and how richly it was deserved, might well seem superfluous, if not impertinent; for there was no man better known or more highly esteemed in the profession than Sir Aston Webb—and probably nobody who had achieved a greater general popularity. Yet there were a few things he should like to say, and no doubt, too, a few things on which they would naturally expect him to give them some information.

Proceeding, the President said: "Let me point out how closely, from the commencement of his career, our former President has identified himself with his profession, and how readily he has lent all his energies and abilities to serve the true interests of his brother-architects. The very year after he was articulated to Mr. Banks (of Banks & Barry)—that is, some thirty-eight years ago—he became a member of the Architectural Association, and from that time onward continued to serve the Association in one capacity or another, until finally, in 1884, he was elected its President. Similarly with our own Institute. In 1874—that is, the year after he won the Pugin Studentship—he joined us as an Associate, was elected a Fellow in 1883, served as member of Council, Hon. Secretary, and Vice-President, and finally became our President in 1902, bringing to the chair a wealth of experience and ability which won the admiration of all. Neither increasing honour nor the burden of works growing every year both in number and importance was allowed to interfere for a moment with his duty to the profession generally or with his kindly consideration for his fellows. In the advancement of his own fortunes he has never permitted himself to forget others; he never misses an opportunity of furthering the interests of those who are still painfully climbing the ladder.

We usually allow our Presidents, when once they have passed the chair, to slip back into a sort of background of semi-obscurity, and thus practically, though not intentionally, limit their opportunities of service. This course has the advantage of making such demands upon new and rising talent as to provoke it to give of its best in the cause of the Institute; but I cannot help thinking that it is a pity we have not some sort of 'Upper Chamber,' not as a kind of *otium cum dignitate* refuge for men who have done their work, but as a Standing Committee in all matters of the

highest importance—matters, viz., which call for the judgment and experience of years rather than the energy and impetuosity of youth. Fortunately for this Institute, Sir Aston Webb has not ceased to take a practical and working interest in its welfare. He remains, as you know, Chairman of the Board of Architectural Education—a most important movement initiated during the term of his Presidency, and fraught, I feel sure, with very great and valuable results.

Outside the Institute the list of his activities and responsibilities is a long one. He is the representative of Architecture at the London University, and holds, as it were, a 'watching brief' in its interest at the Royal Academy, to which he was elected an Associate in 1899 and Academician four years later. He supervises the work in the architectural school there, and many can testify with what ready sympathy and encouragement he meets all who come to him for help and advice. He is a trustee of Sir John Soane's Museum, also of the Architectural Benevolent Society and of the Artists' General Benevolent Institution. There are many other ways, too, as many know well, in which less publicly, but not a whit less truly, he is found serving the cause of Art.

Now let me turn to speak of some of Sir Aston Webb's works—those monuments by which he is already generally known, and by which in time to come he will be famous. His peculiar distinction—and I might say, peculiar good fortune, too—lies in the large number of important public buildings that have been entrusted to him. Many of these have been won by sheer weight of merit shown in competition. Amongst such are to be included the Victoria Courts at Birmingham, the Metropolitan Life Assurance Society's Offices in Moorgate-street, and the Christ's Hospital Schools at Horsham, all carried out in partnership with Mr. Ingress Bell. The first named, the Courts at Birmingham, have served as a model for many similar buildings since.

Our present interest, however, centres in the great works committed to him in London—viz., the completion of the Victoria and Albert Museum and the National Monument to Queen Victoria, both of them won in competition; also the Royal College of Science, opposite the Imperial Institute, and additions to the Admiralty Buildings at the east end of the Mall, both of which he received by direct commission. When not long ago I visited the new buildings of the Victoria and Albert Museum I conceived a great admiration for the arrangement of them. The planning is simple and readable; there are long vistas, and a great central octagonal hall; moreover, all the galleries are of noble proportion. The whole of the interior is to be treated as a background for the exhibits, with little decoration, and depending upon good form and colour. The staircases and galleries are so arranged as to afford glimpses from different levels of the larger objects on view. The external effects can hardly as yet be realised, but I know that the sculptor's art is to be called in to aid in setting forth the nature and purpose of the building. As is so often the case with our public buildings, there is no central approach; but, in the present instance, it would appear possible to open up the square opposite, so that there might be at least an open space from which to view the Museum, and where carriages might stand out of the way of the ordinary traffic. By this means not only would an important centre be more or less adequately indicated, but the great central entrance itself would receive a marked accession of dignity.

If we want to appreciate to the full the advantage of a fine approach to a great public building, we have only to note the result of Sir Aston Webb's treatment of the Mall in connexion with the National Monument to Queen Victoria. Indeed, after viewing the Mall now, we are compelled to admit that the present front of Buckingham Palace, to which it leads, is unworthy of it. As regards the rest of the scheme, the work is not yet sufficiently advanced for criticism. We still wait for the colonnades which are intended to enshrine the monument, but eventually, when Mr. Brock's great work is in its place, these columns will stand in rank almost like architectural Grenadiers in attendance on Her Majesty. A very important,

interesting, and ingenious part of the scheme is on view in the Architectural Room of the Royal Academy. The entrance to the Mall from Charing Cross is masked by a building with curved frontages, one to the Mall, the other to Charing Cross, so that the change in the line of access at this point will not be so noticeable. The entrance to the Mall will be through arches. Within the last week the keeper's lodge has been completed, and its position centrally facing Buckingham Palace-road is seen to be most effective.

These examples are among the happy results of Sir Aston Webb's competitive efforts; but for the consolation and encouragement of less fortunate men, with whom I have every sympathy, I may say that he has not always been so successful in competition—as, for instance, in the cases of the Admiralty, the War Office Buildings, the Imperial Institute, and the Freemason's Schools at Bushey. But when he has scored a win he has taken such full advantage of his opportunity, and achieved such good results, that he has received many direct commissions which were in themselves a flattering testimonial to his ability. The Admiralty entrusted to him the new Britannia Royal Naval College at Dartmouth. In conjunction with Mr. T. M. Deane he built the College of Science Government Offices in Dublin. He and Mr. Bell together are responsible for the Royal United Service Institution adjoining the Banqueting House, Whitehall, the new University of Birmingham now in course of erection, and for certain additions to Jesus College, Cambridge. Then, too, he has done a good deal in the way of churches, both restoring and building. The most important and most interesting of all these is the restoration of St. Bartholomew the Great in Smithfield between the years 1880 and 1890. He has restored three churches in Worcester, Burford Church, Herefordshire, and Witley, in Surrey. He has built St. George's, Worcester; the French Protestant Church and Schools in Soho, and churches in North Wales. Then there are various domestic works; mansions for Sir Offley Wakeman, at near Shrewsbury; Sir Augustus Webster, at Hildon, Hants; and many others. The four mills and granaries for Messrs. Mumford are amongst his most successful buildings of this kind. Altogether it makes a long list—an appallingly long list, we might say—when we consider the vastness of some of the undertakings. Such as it is, it shows what rare ability and power of work Sir Aston Webb is endowed with. Few men could accomplish all that he has accomplished. He is not an artist only, but an excellent man of affairs also, and possesses a tact and readiness of resource which is given to but few. His character shows itself in his work. The intellectual versatility and refinement, the brightness and felicity of temperament, which we recognise in a man, all reproduce themselves in the examples of his art.

Above all, by his sincerity and straightforward dealing he has won the confidence and esteem of all who have come into contact with him. It was his distinctive and characteristic work and personality which won for him the honour of knighthood in November last—an event which gave the greatest satisfaction to his friends and brother-artists. What more shall I say? Tennyson tells us that when the little *Revenge* was taken, the stately Spanish men praised Sir Richard Greville 'to his face with their courtly foreign grace.' But it takes a Spanish Don to do that; besides, Sir Richard was very badly wounded. I think I have said as much as our national reserve will allow enough to convince Sir Aston Webb of our high appreciation both of himself and his work, and in particular of his generous, self-denying labours in connexion with the Institute.

I have much pleasure, Sir Aston Webb, in investing you with the Royal gold medal, and in assuring you of the high regard in which you are held by the whole of the profession.

The President then invested Sir Aston Webb with the medal, amid loud applause. Sir L. Alma-Tadema, R.A., said that, as a member of the Academy and of the Institute, he felt he had a right to express to Sir Aston Webb the great pleasure it gave them to recognise in this way his efforts to forward the great art of which he was such a distinguished representative. In coming to

that meeting one of his (the speaker's) friends said: "Sir Aston has gained pretty well all the honours now; what can be given him next?" To which he replied—and he repeated it most heartily—"The continuation of that respect for the artist and the man and that brotherly love for a friend and a good artist."

Mr. Alfred East, A.R.A., said he desired to add a few words to what had been said in the way of satisfaction that this honour had been conferred on Sir Aston Webb. He took it that the highest mark of approval to any artist was to gain the good opinion of the opinion he valued—the highest reward was to gain the good opinion of those men whose opinion he valued. Sir Aston Webb was in that position, and he must appreciate very highly the honour which had been conferred upon him, because it was at the hands of those whose work and genius he honoured and appreciated. The record the President had referred to was one such as any man might be proud of, and the medal carried with it the congratulations and good wishes of all his brother-architects and friends. Sir Aston was a modest man: he was a painter as well as an architect, and some of his sketches were excellent. He was always doing good works, and left others to find them out. He was the friend of young architects and artists, who felt the influence of his help and advice. He was the friend of the present and coming students, and he believed in the responsibilities of the art he followed, and was proud of that art, as most of them were, and they hoped that that art would make the progress which that Institute desired. As a painter, he felt it a great privilege to be associated with the Institute, for he felt that this sister art was a very noble one. The first impression of the power and importance and interest one had of a city was through its architecture: one had to go farther to find its painting. Those who had the privilege of Sir Aston Webb's acquaintance knew him to be a man from the crown of his head to the soles of his feet—a man who did his work well and who was loyal to his friends and his art.

Sir Aston Webb, in reply, said that the presentation to him of the Royal gold medal given by His Majesty the King on the recommendation of his brother-architects, the members of the Institute, filled him with an overwhelming feeling of gratitude which, unfortunately, he had not the power adequately to express; while the long line of his illustrious predecessors made him keenly alive to his own shortcomings and made him appreciate still more their forbearance in selecting him. He asked them to accept his grateful and heartfelt thanks, for he held this honour as the highest that could be conferred to an architect by his professional brethren, and the medal with the recollection of its presentation that evening, would always remain with him as one of his most cherished possessions; and the pleasure and honour were greatly enhanced by receiving the medal at the hands of so distinguished an architect and so old a friend as the President—one with whom it had been his pleasure to work for so many years—accompanying it, as the President had been kind enough to do, with words which had still further increased his pleasure and obligation. The President had, with that high imagination with which he was gifted, painted a portrait of him for which he thanked the President most gratefully, all too flattering though it be. He did not propose to interfere with the work of a brother-artist who had made much out of such poor material; for though it was certain that from his (the speaker's) very intimate knowledge of the sitter he could add a few realistic touches which would undoubtedly increase the likeness, at the same time he feared they would soil the President's picture, and so he felt that the best thing for him to do was to leave well alone. Again, it would ill become him on such an occasion to speak of his work, which the President had already referred to in so flattering a way. The drawings shown that night (by special request) showed what great opportunities he had had, and he was afraid, also, how far short he had come to realising them. He would only say he had tried his very best and done his best, and where he had failed it had not been through idleness or neglect on his part. There was, however, one work on which he was

engaged on which he should like to say a word—viz., the architectural surroundings for the great National Memorial to Queen Victoria, by Mr. Brock, in front of Buckingham Palace. Owing to the time this great work of Mr. Brock's necessarily took to execute, they had been enabled to proceed with the architectural work of preparing the site in sections, doing a portion of the work (such as alterations to roads, etc.) each autumn at a minimum of public inconvenience, and thus (as architects usually had to do) painting the picture, as it were, wash by wash in the full gaze of the public, who apparently, and not unnaturally, seemed to think that each last wash was the final one, whereas he need hardly say there was much yet to be done. The next work would be the finishing the piers that form the three gateways into the enclosure with groups of sculpture emblematic of the three great self-governing colonies, for which three eminent sculptors had been commissioned under the general direction of Mr. Brock. A start would also shortly be made with the foundations for the building at the east end of the Mall through which, under three archways, would pass the great road into Charing Cross. The idea of placing the building as shown was to form a worthy termination of the Mall and also to screen the change of axis between the Mall and the Strand. But when all the architectural work had been done, it would still be but a frame without a picture, and the public must be kind enough to suspend its final judgment until Mr. Brock's splendid work was complete and formed a magnificent centre to the whole, all the other work being subsidiary and complementary to it. With regard to the general effect, time only would give the trees needed to turn the broad walk through the Green Park into a shady avenue like the broad walk in Kensington Gardens, to which it was equal in width, and time only would make the trees meet overhead and shade the footways on either side of the Mall from the Palace to Charing Cross.

Ruskin long ago pointed out the main distinction of architecture over the other arts in that architects alone amongst artists are called by necessity to "fraternity of toil," and on an occasion such as this one naturally thought of the number of fellow-workers to whom one was of necessity so largely indebted before a great building could be erected and finished. Many of his fellow-workers had honoured him by being present that night, and he thanked them for their presence. To his friend Mr. Ingress Bell, with whom he had shared many successes and disappointments during the last twenty years, he owed most of all, as did the buildings in which they had been jointly associated, not only in matters architectural, but in many other walks of life in which his example had inspired him. The work they had done together had always, thanks to Mr. Bell, been one of his (the speaker's) greatest pleasures: one of the results of it was shown that night in the new buildings for Christ's Hospital. To his staff he was also largely indebted, ever changing as it was, for it was his happiness to have young men and to see them one by one launch out for themselves. When they left him it was as personal friends, and he hoped they felt they had had a real share in the work they did together, and that they had helped him to the honour done to him that night, as they most assuredly had. He often felt they had all the drudgery, he had all the fun; but their turn would come. He had also been most highly favoured in having had the advantage of life-long friends to work with in almost every department. His surveyors, Messrs. Corderoy & Selby, had worked with him from the very beginning. They all knew the invaluable aid surveyors gave in the preparation of the indispensable quantities and interminable measurements, and in the unravelling of apparently hopelessly tangled accounts, and in many other ways relieving architects from much anxiety and leaving them free to more congenial work. He often felt that surveyors' work was hardly recognised as it should be. In the main and great branch of the architect's work represented by the builders, he had also been most fortunate, and he owed them much in every way, especially for their skill in setting out the work and fulfilment of one's designs, for which, again, he feared

architects did not always give them full and adequate recognition. In no time, he believed, was better and more lasting work done than at the present time. Very important, also, to architects were their clerks of works. Many had served him faithfully for years, and they were also represented that night, for they also had materially aided in the event of that evening. Then there were a crowd of craftsmen and artificers to whom he was greatly indebted for many years of highly skilled assistance carefully rendered, but whom it would be impossible to mention in the time at his disposal, though he hoped it might appear but right and just that he should, on such an occasion, make this slight acknowledgment of the invaluable assistance he had received, and would pardon him for having, after all, spoken more of himself and his work than he had intended.

His predecessors in this honour—and he was amazed indeed to find he was in such fine company—had usually, he thought, spoken on these occasions on the contribution of architecture as they found it in *their* time, and the different phases they had represented, each no doubt firmly believing they were on the right track, from Cockerell, the first medallist and the most refined of Greek architects; through Barry, the most refined Renaissance architect; and so on through the Gothic school of architecture to the archaeological Gilbert Scott, the vigorous Street, the scholarly Pearson, and the practical Christian. And now what did we find? Much progress, as it seemed to him, much improvement, a closing up of the ranks, a desire to pick up the strain of English Renaissance where they last left it, giving it a distinct flavour of our times, making tradition our servant rather than our master; so that, while we endeavoured to make our buildings as beautiful as we could, we were determined at the same time to build sanely and reasonably, and, as far as in us lies, beautifully; to make the necessities of the building develop the design, and not to be content until we had met all modern requirements of planning, and naturally combined these requirements with a fitting architectural exterior and interior, not ignoring what had gone before, but eschewing whatever appeared to us to be evil, and holding fast only to that which is good. This he verily believed to be the tendency of to-day. He had always been an optimist in the work of his brother-architects, and was so still. He saw in this tendency to work on parallel lines a possible, indeed probable, loss of individuality; and in a recent case, where he had some 130 anonymous designs before him, he found it impossible to recognise the authors by their drawings. There was a certain loss in this, but he believed it would be made up by a general improvement and levelling up of work executed. We must believe in art if we were to advance it; we must believe in and encourage each other's work if we were to go forward, as he believed we should go forward; for there were signs of a greater pride of citizenship arising, and a dawning of belief in the necessity of the city beautiful as well as the city useful. "Let us see that we are ready to realise these aspirations as they arise, for hard-headed, practical men are beginning to realise that noble dispositions in a town, noble streets and buildings, are an education as necessary for the higher development of patriotism and public spirit as good water and sanitation are necessary for the bodily well-being. A certain sinking of individuality may be necessary to secure the harmonious whole. This we must be ready to give. The general result on the city and on our building must be our sole and chief concern, and we must be content to sacrifice ourselves if necessary for the general good. Will you pardon me if I quote Ruskin once more on fraternity of toil?" He said in that famous lecture of his before the Architectural Association: "In those misty and massive piles which rise above the domestic roofs of our ancient cities there was—there may be again—a meaning more profound and true than any that fancy so commonly has attached to them. Men say their pinnacles point to heaven; why, so does every tree that buds and every bird that rises as it sings; but this they have of distinct and indisputable glory, that their mighty walls were never raised and never shall be but by men who love and aid each other in the

weakness, that all their interlacing strength of vaulted stone has its foundation upon the strong arches of manly fellowship, and all their changing grace of depressed or lifted pinnacles owes its cadence and completeness to sweeter symmetries of human soul.' This, I take it, is the poetical way of saying we must pull together and work together, look forward and not look back, and believe in ourselves, in each other and our art; and this, I take it, is the main purpose of this Institute of ours. It seems to me to-night as if it were but yesterday that I first commenced to practise, and yet this function reminds me that I am rapidly arriving at the other end. No matter, this is as it should be. We hear the next generation already trampling at our heels, ready to take up the work and to carry our art, as I believe, further than has ever been done before."

Portrait of Sir William Emerson.

Mr. T. E. Collcutt said he had much pleasure in asking the President to accept, on behalf of the Institute, the portrait of their former President, Sir William Emerson. He was glad to do so because it afforded him the opportunity of expressing the esteem in which he held Sir William—an esteem which they must all feel. He had had the pleasure of working with Sir William on the Council of the Institute, and during his Presidency, and he was sure Sir William would always be remembered for the soundness of his judgment, his tact, and his courtesy, and for the fearless manner in which he expressed his opinions on matters which were sometimes a little controversial. As an architect, Sir William had made his name honoured amongst his brother-architects, and the work he was now engaged upon—the memorial in India to the late Queen—would, judging from the drawings they had seen, be a fitting monument to a great Queen and a lasting memorial to its eminent designer. He had known Sir William for a great many years, and he was sure that his brother-architects would agree with him in saying that he had endeared himself to them by his geniality and his many fine qualities. He therefore asked the President to accept this fine portrait, by Mr. J. J. Shannon, R.A.—a portrait of a distinguished architect painted by a distinguished artist.

Mr. Collcutt then unveiled the portrait.

The President said he had much pleasure in accepting it on behalf of the Institute. It was a valuable addition to a fine series of portraits of past presidents by some of the most distinguished painters of their day. The Institute's appreciation of these works must not be judged by the position the portraits occupied on the walls, for, unfortunately, owing to lack of accommodation, many of them had to be skied. They were looking forward to the time when they would have rooms in which they could display their treasures to advantage. He congratulated Mr. Shannon upon his successful work, and he had pleasure in asking him to accept a small book of portraits of past presidents and in proposing a vote of thanks to him for painting the portrait.

The vote having been very cordially agreed to, Mr. Shannon briefly replied.

The President announced that a special general meeting would be held on July 3, when certain amendments to the regulations for competitions would be brought forward.

The meeting then concluded.

NOTES AND SKETCHES IN SOUTHERN ITALY.—XII.

FOGGIA AND MELFI.

FOGGIA was always the meeting-place of the roads from Ancona, Naples, and Rome on one side, and Bari and Brindisi on the other; has always been, and still is, an emporium for commerce and exchange for the south of Italy. It is the chief town of the Capitanata, and has more than 30,000 inhabitants. It lies on the Tavoliere di Puglia, the rich lands where flocks and herds have fed from a very ancient period. It is the representative of the ancient Argyra, which was a few miles away in the direction of Manfredonia, now known as Arpi, which was in its day the chief town of Apulia. Argyra is mentioned in a Greek document of the XIth century, but was abandoned after the devastations of the Saracens, and Foggia supplanted it, or was founded by

the fugitives, as some say. It was large enough in 1048 to be worth Drogon's taking, and in 1072 was taken again by Robert Guiscard, and subsequently by Roger. The name comes from a church, S. Maria di Fovea (from the marshy place in which it was built, Fovea or Foggia), which was declared a Cappella Palatina, like S. Nicola of Bari, by a diploma of Roger Duke of Apulia dated 1089. This church was directly under the Norman ducal house, and the city was governed by a magistrate, called a chamberlain. The administration was in the hands of twenty-four citizens, selected from families which were distinguished for talent and rectitude, and the title by which they were known, "Collegio dei Reggimentari," makes it evident that Greek was then going out of use. The cathedral was founded by Robert Guiscard, and the crypt is generally assigned to him, but it was much enlarged and beautified by William II. In Frederick II.'s time the city began to spread; quarters were built for the troops, and an imperial palace, of which only a small remnant remains, while public squares were laid out and the population increased. In this palace his wife, Isabella of England, died in 1241, but was buried in the crypt of the Cathedral of Andria, where his first wife, Iolanthe of Jerusalem, is also buried. The first edict from the palace is dated February, 1221. It was finished in 1225, and after that date documents show that he lived in it for some part of every year. Here he received the legates of the Pope in 1230, and ten years later convened a general parliament of the barons of the kingdom. After his death his body was brought to Foggia and embalmed; the heart and viscera, enclosed in an urn, were placed in a stone chest, which rested on four columns of verde antico above the outside of the main door of the cathedral, a monument which was thrown down by the

earthquake of 1731. The body went to Taranto, and so to Palermo. The papal troops descended on Foggia immediately, but it was soon after besieged and taken by Manfred, who drove out the legate of Innocent IV., afterwards making peace with his successor, Alexander IV. At this time the walls and towers were destroyed. On his coming from Germany, Conrad summoned a parliament here, and Manfred resigned his charge. Conrad died in May, 1253, in Foggia, after five days' illness, and Manfred was accused of poisoning him. His son Conradino being reported dead, Manfred, who had been regent, had himself crowned in Sicily. After Manfred's death at Benevento, Charles of Anjou sent Guillaume Landau, of Paris, as governor, but on the approach of Conradino Foggia rebelled and joined him. It was punished by being sacked. Charles I. of Anjou also lived here frequently, and many of his acts are dated from Foggia. In the cathedral his daughter Beatrice was married in 1273 to Philip, son of Baldwin, Emperor of Constantinople. He built a hunting lodge or villa, with park and fishery attached, in a place called Il Pantano, and a fortified palace; dying here, in 1284, while preparing a fleet at Taranto to rescue his son Charles from Roger de Loria, the Spanish admiral who had taken him prisoner outside Naples. A mausoleum in the cathedral, which was destroyed in 1731, enclosed his viscera. During the war between Lewis of Hungary and Giovanna I. of Naples Corrado Lupu took Foggia and sacked it, murdering many of the citizens. Giovanna I.'s third husband, Otho of Brunswick, also died in Foggia, and was buried in the cathedral, but his tomb, too, was destroyed in 1731. Carlo di Durazzo (Charles III.) also lived and died in Foggia, leaving two children, Giovanna and Ladislas; after the death of the latter his sister became



Fig. 1. Well for Drinking-Water, Foggia.



Fig. 2. Melfi: from the Castle.

Giovanna II. of Naples. Ferdinand I. of Aragon held a general parliament in Foggia to prepare for an expedition against the Turks who had occupied Otranto, and encamped during the barons' rebellion round the city. The serious earthquake of 1731 (March 20) damaged many of the buildings greatly. One hundred and sixty-four people were killed, and the streets were full of persons in night attire hurrying out into the country. At this time the sacred picture preserved in the crypt of the cathedral was believed to have come to life for a time, and was a great factor in restoring the people to confidence and composure. It is dark, painted on cedar wood, and is believed to have been brought to Arpi from Constantinople at the time of the Iconoclastic persecution (716). It is, of course, ascribed to S. Luke.

The cathedral has a crypt of the same size as the church above, as at Siponto, and there is a flight of steps leading down to it from the street at each end of the transept, suggesting that the ground may have risen. It is divided into two parts, as at Trani, by a solid wall with three doors, one of which, under the nave and aisles, consists of square bays vaulted without ribs, the arches resting on cruciform piers; the other, beneath the transepts and choir, has at the crossing four short columns of red marble on large bases, and with caps the carving of which seems to indicate a later date than 1068. Summonte gives an inscription which existed in his time on the jamb of the west door:—"Anno ab incarnatione Domini MCLXXIX M(ense) MADII R(egnante) V(nicelmo) Hoc opus inceptum est," and this gives the date of William II.'s improvements. The facade has been much altered in baroque times, but still retains a frieze above the lower arcade, with strongly-carved corbels and interspaces, like that at Troja. At each side of the door an original two-light window remains. It had an arcade of five round arches, with broader piers at the angles, in the Pisan manner; under the outside arches are inscribed circular plaques. The door has been recast, as has the rose window above it, showing a most curious mingling of XIIIth century and rococo forms, but the pointed arch which filled the gable above it can still be traced, supported on coupled columns, and on each side was a little window beneath an arch with pilasters in the wall. A heavy carved cornice completes the facade, and a flight of many steps leads to the door. The side elevation is also Pisan in character. It has horse-shoe arches to the little windows and insaid squares in the spandrels very like the early part of Troja. In this case one may acknowledge the possibility of direct Pisan influence, since Robert of Bovino was bishop of Foggia in 1190 and the Pisans had an emporium at Bovino, but the likeness to Troja is so strong that it seems

more probable that it is imitated from that cathedral. The columns of the interior are of marble, and are about 24 ft. thick. The church is vaulted throughout. The nave and aisles are for the most part baroque, due to the rebuilding after the earthquake of 1731. The transepts are as broad as the nave and aisles, and each have three square bays. The eastern arm of the cross has also three square bays, and the east wall is perfectly flat.

The palace of Frederick II. has almost entirely disappeared. It stretched from the present fish market to the part now called the "Quattro Corse" and a round well which faces on to the "Piano della Croce," which lies outside a most picturesque city gateway, the Porta Grande. The entrance gateway still remains, built into a dwelling-house. It has a carved moulding of rather Byzantine character running round a circular arch, and the imperial eagle, and on the lintel below are long inscriptions, which give the date 1223 and the names of Frederick II. and of the Proto (magister) Bartholomeus, who was the father of the Nicholas who made the splendid ambo at Ravello. Under the "Piano della Croce" are the "fossi"—great cellar-like excavations in which the corn brought in from the country round is stored. When we were there in the spring some of them were being cleaned out and repaired. The water supply of Foggia is not good, and one of the industries of the town is drawing drinking water from certain wells and carting it to the houses in little barrels. Some of the wells are quite architectural in treatment, though rather late in date (Fig. 1). There are a few buildings of the early Renaissance, which are interesting, but Foggia is in the main a very modern town, with the rapid magnificence of modernity.

Melfi (Fig. 2) is a small town of about 10,000 inhabitants, situated in a half-destroyed lateral crater of Monte Vulture. From the railway a little beyond the station it piles up most picturesque. It is on the borders of Lucania and Apulia, was at one time capital of the latter province, and, according to some, Frederick II. had the idea of making it the capital of the kingdom. The citizens were called Melfenses and Melfitani, and were often confounded with those of Molfetta and of Amalfi. Erchenpert the Lombard of Beneventum (IXth century) mentions Melfi as existing in the IVth century. The story of the Amalfitan chronicle is that some Romans going to Constantinople at its foundation were shipwrecked on the Slavonian coast; two ship loads reached Ragusa, where they stayed for a time, but, things becoming uncomfortable, stole ships and crossed the Adriatic to near Melfi. There they stayed, and called them selves Melfitani, but not finding the locality safe, went on to Amalfi, which they called by that name in memory of Melfi. When Lauriac sacked the town in 1528 the archives

were destroyed, and if any documents survived, they were stolen by a capitular vicar at the end of the XVIIIth century, according to Signor Araneo—so that direct documentary evidence is almost non-existent; but it is known that the Normans took the city in 1040 or 1041, either by assault or through the persuasions of Arduin. Lombard churches were in the city, and Lombard customs were followed at that time. The Normans built the castle and perhaps the walls of the city (outside of which Roman tombs have been found), and after the second defeat of the Greeks William of Apulia says that Melfi was divided into twelve districts, and twelve palaces were built for the twelve Norman counts. After their third victory a parliament was called at Melfi of all the Normans, when their conquests were divided among the twelve, Melfi remaining the chief town, and William Ironarm being recognised over-count. Five councils were held in the city; here in 1059 Nicholas II. invested Robert Guiscard with the duchies of Apulia and Calabria, and thirty years later Urban II. did the same for Roger. In 1058 Robert was married here to Sigelgaita of Salerno, and in 1074, after the conquest of Palermo, received the homage and congratulations of the barons. Here Roger the Great Count held a general diet in 1128, at which he determined to assume the title of King of Sicily. Frederick II. published the constitutions of the kingdom at Melfi in 1231, and ten years later summoned all prelates thither to exhibit their treasures, which he borrowed, but never returned. In 1252 Conrad and Manfred spent Christmas here, and the parliament of February, 1253, held here voted 30,000 "once" of gold to the King. The decay of the city began under the Angevins.

The bishopric was founded in 1037 by Nicola, first Archbishop of Canosa and Bari. At the end of the century it was put directly under the Holy See, and in 1528 was united to that of Rapolla by Clement VII. The cathedral was rebuilt after the disastrous earthquake of 1851. It was founded in 1153 by the two Rogers, the Count and his son, who was father of Tancred. The campanile did not suffer very much in the earthquake. The battlements of Frederick II. at the top were thrown down, and have been replaced by a frieze of tufa. Signor Araneo says that the bishop wished to lower the campanile on the plea that the bells could not be heard. "The true reason was that he did not want to spend money. It was not possible to replace the battlements, because at the mere name of Ghibelline he twisted about and became mad." He gives the measurements as 35 palms, width of the square of plan, 140 height to the cornice, 10 the octagonal story above, and 30 the pyramidal spire form. On the first story are three lions of white stone, roughly cut,

projecting in the Apulian manner, two on the west and one on the south. In the others are four two-light windows with little marble colonnettes. An inscription gives the architect's name as "Nosio Remerius." Antique fragments of sarcophagi are walled into it. The upper part is decorated with lava inlays of dragons and ornamental forms, and the octagonal portion is covered with glazed tiles in the Sicilian manner, pale green, blue, and white on one side and yellow and purple on the other. The floor of the aisles has also painted tiles, and there are a few pieces of mosaic pavement. The flat roof of the nave is heavily carved and gilded. The campanile of another church below the castle also has simple inlays of lava.

The castle and other towers were destroyed by Roger in 1128 as punishment for the revolt excited by Honorius II., but he rebuilt it two years later, though in another three years he sacked the town on account of its having declared for Lothair III. Frederick II. used it as a residence, and so did the Angevin kings. Pierre d'Angicourt made many alterations for Charles of Anjou in 1278, and additions were made in 1296. The frequent earthquakes have damaged it in the same way as the rest of the town; the worst were in 1694, 1851, and 1857. A desecrated church, S. Maria Nuova, shows a door with zig-zag mouldings but a segmental arch, and a window in a small house has a central shaft and round arches. There are a good many early Renaissance doors and windows (Fig. 3), and in the

courtyard of the municipio is a well with the Caracciolo motto: "Nemo impune lacesset" on the gallows-like arrangement of the rope, which has given rise to stories in connexion with Lautrec's sacking of the place. Here, under lock and key, to protect it from boys stone-throwing, in a store for charcoal and wood, is a very fine antique Roman sarcophagus, with figures of gods and goddesses beneath an arcade of six columns, the entablature being bent up in segmental arched form in the external spaces, beneath which are seated figures, while in the centre is a low pediment; the figures being of the same size, the second and fourth break the line of the architrave (which is set back a little) with their heads. The figure of the deceased (a woman) lies in an easy attitude on a couch, which forms the lid; beneath the couch is a shallow frieze of dolphins and sea monsters. The other side and the ends are decorated, as well as the front.

The streets are paved with blocks of lava worn into irregular ruts in many places, down which the water rushes in heavy rain like miniature torrents with waterfalls. We were told that quite a fifth of the inhabitants had emigrated, and were given a most joyful picture of the depression of trade and industry.

F. H. J.

GAS OFFICES, READING.—The new central offices of the Reading Gas Company in Friar-street, Reading, are now completed. The architect was Mr. George W. Webb, architect, of Reading.

DECAY AND PRESERVATION OF STONEMWORK.—II.

Seasoning.—Stones are often valued because they are easily wrought when first taken from the quarry, and subsequently become harder when exposed to the atmosphere, and this quality arises from the chemical change which takes place on the evaporation of the water termed "quarry sap," contained in the stone when lying in the quarry.

The old masons were very particular about the seasoning of the rough stone blocks before using, and each block as it came from the quarry was placed under cover from the rain, and instead of being laid flat on the ground was tilted up or inclined upon one of its corners, to enable the quarry sap to drain out. Its position also allowed a free access of air to play round the block, which facilitated its drying. This process was carefully watched, and if any latent defect appeared during the drying the block was rejected.

The operation of seasoning the stone took several months before any work could be commenced upon it, and it is admitted that this method would add to the cost; but, on the other hand, it is believed that the money would be well spent if this precaution should prevent the wasting of such stones by atmospheric influences, which (especially in cities and large towns) soon act on the surface of a newly-quarried stone.

Again, stone that is quarried one day and built into the wall the next is in a "green" state, and is not in condition. It is at its weakest; its pores are open, and ready to absorb not only moisture, but pernicious agents, which tends to its destruction.

Economy is, unfortunately, the ruling power of the present day, hence the use of unseasoned stone, which can be worked expeditiously and with great facility, for it is well known that to work a stone that has laid by for some time is very different from the labour bestowed on stone fresh from the quarry, the former being the hardest and toughest, a fact which of itself is regarded as sufficient evidence to warrant the course recommended—namely, to thoroughly season the stone before using.

Indeed, if this seasoning process, which is the gist of sound building, was carried out in its entirety, it would go a long way to ensure the preservation of our stone buildings. It is therefore suggested that the stone to be supplied for a proposed building should have been quarried at least six months before any work is put upon it, the stone merchant giving this guarantee.

It may be urged that it would be impossible to carry this idea through in practice, as whenever a number of large buildings are being erected at the same time the demand for stone of the best quality is greater than the quarries already opened can supply. The contractors are bound under a heavy penalty to finish the work by a stated time, and hence are compelled to use a material which perhaps they would otherwise reject.

Natural Bed.—All worked stones, with few exceptions, should be fixed on their natural bed—that is, as near as possible to the position they held in the natural rock before being quarried, for set in this manner they are most durable.

In arches the bed or (what is the same in effect) the laminae of the stone should be at right angles to the thrust, or as near as may be parallel to the radiating joints of the arch stones. For cornices the stones are better edge bedded, except the quoin blocks, which should be specially-selected stones and laid on their natural bed.

The laminae of the stone are in some cases so obvious that the natural bed is easily determined; in other instances a good deal of practical experience is required to determine the way of the bed.

In the politic series small flat shells are sometimes visible, and faint streaks of earthy matter; these should always be parallel to the bed, and are seen better when the stone is wetted, but it requires an observant eye to detect them. In the absence of these marks the mason is often guided by the free working of the stone.

In close-grained stones which do not present a decidedly laminated structure it is almost impossible to carry out this principle of natural bed, the impracticability of following it through its maze of turnings before it gets to the "banker" being insurmountable.



Fig. 3. Melfi: Doorway made of Renaissance Fragments.

Although it would, of course, be better to fix it on its bed, the importance of doing so is perhaps overrated in stones of this kind. The bed of the stone should, however, be indicated on the rough block before it leaves the quarry by a horizontal line or a letter "B" at each end of the block.

Working by Hand and Machinery.—Amongst observant men there is great fear that the quality of craftsmanship in masonry is deteriorating. Whether this is due to a decline in the intelligence or skill of the operative or to the ever-increasing use of machinery it is difficult to say, but neither in the quality nor in the quantity of the work done of late has the old status been maintained, whilst the cost has materially increased.

The economic changes which are now taking place are doubtless responsible for the extended use of stone-working machinery. To this the mason offers no opposition; it is recognised by him as a power that cannot be dispensed with, and to some extent helps him. But, with all our improved appliances in machinery and newly-fashioned tools, the mason as a craftsman is not going forward, but retrogressing, and, although we still have skilful men capable of turning out excellent work, the mason is fast becoming, through no fault of his own, an automaton, and the "old hanker hand" whose "heart is in his work," as Longfellow expresses it, seems likely to disappear.

The clean, crisp cut of the chisel is now absent from the finished façades of our new buildings, and instead we get the machine-scraped surface, which is not always conducive to the durability of the stone, but rather the contrary, the face in many cases being slightly pulverised, according to the sharpness or otherwise of the cutting tool used upon it.

This is one of the present defects in stone-cutting machinery, which marks it inferiority to hand-wrought work, where individuality is stamped upon each block.

In this age of high speed potentialities of machinery should be utilised to do all the hardest of the work in connexion with masonry, such as hoisting, sawing, rubbing, turning, and roughing out.

This all needs extremely hard manual labour, and it requires men physically strong to accomplish such work, which can be better done by machinery, with its immense power.

The machines could rough out mouldings, contours, etc., with facility to within, say, a quarter of an inch of the finished surface, the mason taking up the work from this point and finishing with the chisel. The hardest part of the work having been performed by the machine, the mason would be able to throw his whole energy into the work, shaping each block with a craftsman's skill and leaving the imprint of his hand, so that when finished it will bear the closest scrutiny.

In this work the mason will excel only if his efforts are encouraged in the right direction, namely, by architects insisting upon hand-wrought work on all external portions of their buildings.

By this means superior work will be attained. The stonework will also better withstand the weather, and it is by endeavours such as this that the workman can be saved from degeneracy.

From an economical point of view, it also seems better, as the shaping and adjustment of the machine plane irons, which are a great item in the cost, could be entirely dispensed with.

Fixing.—During the course of fixing or setting the stones in a building all the work of stopping-in of mouldings, trimming, paring, etc., with the chisel should be performed at the same time, so that on completion no after work is required to disturb the surface, and the cleaning down process, which is usually associated with a lot of chiselling, rubbing, etc., will resolve itself into a simple washing down with water.

This is one of the things essential for the preservation of stone, as directly after the stone is worked, and on first exposure to the weather, by some chemical action or change case-hardening takes place, and a kind of skin is formed on the face of the stone, which it is desirable should not be disturbed.

Arresting Decay.—It may be remarked that when once decay has begun in a building stone

it is almost impossible to effectually stop its progress. It is therefore important to afford a protection to it before decay has commenced.

The changes produced in stone must primarily be ascribed (as before stated) to the solvent potency of water, the more so when it is charged with the destructive gases of the atmosphere of smoky towns.

Therefore to prevent the water from entering and soaking into the stone should be the first endeavour. For this purpose it is suggested that all projections, such as the weatherings of cornices, strings, sills, cappings, etc., should be covered with sheet lead, well dressed down on the top surface and over the nosing.

This would not entail a great cost, and the benefits would be considerable.

Any preservative solution for the general surface, to be of practical value, should be of a simple kind, and capable of application by means of a brush or spraying machine to the surface treated, so as to combine efficiency with economy.

A great number of preservative solutions have been devised and tried, but none of these, so far as can be gleaned, have been brought into general use or met with any great degree of success in staying further decay. The preparations may generally be divided into two classes. The first of these are chemical solutions, containing chiefly soluble silicas of soda or potash and solutions of baryta, calcium, etc.; these chiefly contain alkaline salts, which often cause efflorescence on the surface to which they are applied, in the form of a white powder, and sometimes result in the disintegration of the stone instead of tending to its preservation.

The supposition that these chemical elements will enter into union with the constituents of the stone is, perhaps, a step in the right direction, but with our limited knowledge of how Nature works in her combinations, it seems impossible to successfully imitate her in her productions.

Hence the many cases of failure.

The preservatives of the second class contain dissolved organic substances, such as oil, paraffin, naphtha, asphaltum, wax, etc.; but, as these substances are liable to decay, the protection is considered to be only of a temporary character.

However, no harm can arise from using any of these substances, and in some instances the results are, to some extent, satisfactory. Especially is this the case in the use of boiled linseed oil, or sulphuretted oil, which may be recommended in preference to others. This should be applied two or three times on a perfectly dry surface; the stone is slightly darkened by this process, but eventually it tones down and is scarcely observable.

A solution that has been much used of late years is the "fluat" of the Bath stone firms; but it is a question whether a sufficient time has yet elapsed to prove its value.

Another solution well spoken of some years since, and used chiefly for the Bath stones, but adapted for other similar stones, is prepared as follows:—Into a tub of clean water put some fresh lime, stir it up well, and when slaked let it settle, remove any impurities that may arise to the surface, and when clear apply it with a clean brush to the stonework, giving two coats. This is considered an excellent preservative; it is simple and inexpensive, and at least it can do no harm.

A few words with reference to the Canterbury Bell Tower.

It is easy to conceive that at the date this tower was built (about the end of the XVth century) the difficulty of obtaining a large quantity of stone from a distance would be enormous owing to the bad condition of the roads, and the conveyance of a supply of stone for a large edifice would necessarily be attended with a vast amount of labour, and, in many cases, the difficulties would appear insuperable.

Hence it would seem easier, and, consequently, cheaper, to obtain Caen stone from Normandy, to convey it by water to Dover, and thence along the Roman road to Canterbury, than to obtain stone from our English quarries, to which the roads (if any existed) were in a bad condition. For it may be

stated that economy was in those days, as it too often is now, an overruling power.

In ancient buildings we rarely find a stone much larger than could be conveniently carried or moved by two or three men. This is probably accounted for by the difficulties of transit, and it is known that pack horses in pairs were utilised for the conveyance of stone where wheeled vehicles could not be used because of the condition of the roads.

This, too, would account for the want of bond which is so marked in old buildings, as every piece of stone, because of its scarcity, would have to be made use of.

Caen stone, of which this tower was built, was apparently not used in this country prior to the Norman invasion, but it appears to have been extensively used for building purposes in the South of England from that date to the time of Henry VIII. (1509-1547).

For external work it does not compare favourably in point of durability with various stones of the same character quarried in our own country; in fact, it will not bear comparison with Bath stone, the least commendable of our soft oolites.

Caen stone has this advantage—that it is easily wrought, can be got up finely, carries a sharp arris, and a skilful workman may do almost as much work as he pleases in it, and, to sum up, it decomposes in a shorter space of time than any other stone.

It may, however, be said in its favour that doubtless some of its varieties possess different degrees of durability, and the stone we now obtain is probably not of the same quality as formerly.

Examples of its failures in modern buildings, erected between fifty and sixty years ago, are numerous and apparent, and include structures such as Buckingham Palace (facades), the palatial clubs in Pall Mall, including the "Carlton" and "Army and Navy," the Conservative Club at the bottom of St. James's-street, and many others, all of which are in a state of decomposition.

It is somewhat surprising that a few architects of that date, eminent though they were in their calling, were certainly ignorant of the qualities of Caen stone or they would not have used it so freely; for professional men will hardly run the risk of injuring their reputation merely for the satisfaction of a fashionable craze.

It is gratifying, however, to find that the architects of the present day are alive to the necessity of selecting a good stone to withstand the weather, so that in the buildings of the present time there is something which future generations may look upon with pride.

It is, therefore, a pleasure to note that the architect for the restoration of the Bell Tower has selected Douling stone from Somerset, one of the shelly oolites.

This series of oolites forms a splendid class of weather stones, and for buildings in towns cannot be surpassed. They include Ancaster and Haydon, from Lincolnshire; Casterton, Clipsham, and Ketton, from Rutlandshire; Taynton and Windrush, from Oxfordshire; Weldon, from Northamptonshire; Ham Hill, from Somersetshire; and Portland, from Dorsetshire. In most of these stones the ova may clearly be observed, showing the interstices filled with a highly-crystalline cement which adds to its power of resisting decomposition.

The only one of the series of Bath oolites that stands the weather well is "Box Ground" stone, but this quarry appears to be nearly, if not quite, exhausted, as it does not now seem to be quoted in the merchants' price lists. A good example of its use may be seen in the Duke of Sutherland's house, opposite St. James's Palace.

In conclusion, for a long period now the most refined taste in architecture has been extensively practised in this country, and the buildings, if ever equalled, have never been surpassed. These are looked upon as the architectural glories of our native land, and their conservation should appeal to every loyal subject.

Progress should be the watchword of the architect and craftsman, for without it there is retrogression. Hence it is the aim of the writer that the few suggestions here offered may be the means of improving in some measure the stonework of our future buildings.

W R. PURCHASE.

ST. MARK'S, VENICE.

FOLLOWING ON Mr. R. Blomfield's protest, to which we have recently referred, the Society for the Protection of Ancient Buildings have prepared a memorial to be presented to the Minister of Public Works in Italy, of which the following is the English wording:—It will, of course, be translated into Italian for presentation:—

"St. Mark's, Venice.

We, the undersigned, having in view the incalculable value of St. Mark's Church at Venice as an historical monument of great beauty, submit to your Excellency that it is of vital importance that the building should be handed down to posterity intact, except for such works as are proved to be necessary to its preservation.

We feel confident that such works as underpinning, consolidation, and strengthening generally will be dealt with in a competent manner by the architect now in charge of St. Mark's, but we venture to submit that the substitution of modern reproductions for the old carving, the removal of the mosaics to the tribunes or piers supporting the central cupola, and more particularly the taking up and levelling of the old floor of the church, would not in any way whatever contribute to the security of the building, whereas such works would destroy what have been for centuries its characteristic features.

We submit that no modern reproductions, however exact, can have the same value as the original work; that, in the case of St. Mark's, the affection of educated people in all countries is concentrated on the stones and marbles themselves as they now are, and as they have ever been, and therefore that their disturbance and renewal would inflict irreparable injury on the historical value of St. Mark's, and would destroy the infinite satisfaction which it still has for those who care for the past.

We therefore appeal to your Excellency to direct that the proposals to interfere with the mosaics, the carving, and the floor shall be abandoned, and strictly to limit the works now being undertaken to what is proved beyond question to be necessary to the permanent stability of St. Mark's."

The Society are desirous to obtain the signatures to the above memorial of well-known and influential persons, having determined to rely rather on the influence and position of the signatories than on mere numbers.

THE ROYAL SANITARY INSTITUTE: SANATORIA FOR CONSUMPTION.

A SESSIONAL meeting of the Royal Sanitary Institute was held on Friday, last week, in the Parkes Museum, Margaret-street, W., Major-General the Right Hon. Lord Cheylesmore presiding, when a discussion, opened by Mr. Edwin T. Hall, took place on the subject of "Sanatoria for Consumption: Design and Location."

Mr. Hall said that the best position for a sanatorium was the southern slope of a gentle hill near its summit, with tree shelter on the north, east, and west. For subsoil, sand or gravel was the best if attainable, because it was dry and warm, but a naturally well-drained site must, in any case, be obtained so that the land may not get saturated with water, otherwise it would be cold and unsuitable. A pure water supply must be available, and, before any site is adopted, full inquiries on this head should be made. Sewage disposal was of great importance. If a public sewer was at hand it would naturally be used; but if this was non-existent then other systems must be considered. Where there was a large area of meadow land available, a simple system of filtration and precipitation, aided by chemical infusion, with ultimate disposal on the land, was sufficient. The septic tank system is used in England, but there was no doubt that, in many cases, the small from these tanks was considerable until they matured, but eventually they gave a safe effluent in which fish could live. A screen of trees for the shelter of the sanatorium was the best and most pleasant, better than a bare hillside, because it breaks wind currents without arresting them or causing eddies. Prospect was of great curative value. In aspect, south was best of all, where the sun's direct rays might permeate every room, cheering, and cleaning, and germ-destroying. As to design, first in importance was the welfare of the patient, and second the convenience of the administration. The one-unit building—based on the hotel or barrack—appeared to have been, and still largely is, the type in Germany, France, and Switzerland, and the sanatoria are three, four, and five stories high.

Mr. Hall then described several foreign sanatoria, and showed a number of plans. The Falkenstein Sanatorium, Germany, was, in effect, a large hotel, which began from a

small private mansion, but had been added to at different times. The kitchens, larders, and offices were on the basement of the central building—U-shaped on plan, the arms being nearly at right angles to the centre. This block faced east-south-east. It was four stories in height, including the basement, and there were three main staircases. To the north-east was a very large dining-hall opening on the south-south-east to a wide verandah, which was extended to form a covered promenade 200 ft. long. The other corresponding wing had an enclosed gallery facing west. The medical staff houses and consulting-rooms were at the extreme ends. There were no regular nurses, but the whole plan was under medical direction, and accommodation was provided for 120 patients of either sex, in seventy single and twenty-five double-bedded rooms. Most of them had south aspects, but many had not. There were only two slipper-baths for patients, and a douche-room. The Liegehallen were attached, forming wide verandahs on the three sides of the terrace at the basement floor level, and, in the grounds, there were several open pavilions and summer-houses.

Ruppertsheim was a compact building, crescent in form, consisting of a basement with four stories above, in which the administrative departments and patients' room were all contained. It accommodates 112 patients in wards containing one, four, and six beds each. These rooms are in single file, and face south, with a corridor on the north side. There are two main staircases. There are nine slipper-baths and one douche-room for men, another for women. There are a matron and five nurses. The Liegehallen are two-storied, one on each side, attached as wings.

At Engelthal the Nürnberg Heilstätte is one building, with basement and four other floors. Here again the administrative departments are in the same block as the patients. Fifty patients are accommodated in seventeen bedrooms; two only have one bed, others three and five beds each. All face south. There are three nurses. There is but one staircase in the building, which would hardly pass our fire-escape authorities. There are four slipper-baths and three douches, all in the main building, as are also the six water-closets. The Liegehallen are detached.

The last two institutions described were of the one block, but the next was quite different.

The Städtisches Sanatorium at Harlaching, near Munich was, to be accurate, a hospital where the large majority of patients were consumptive. The main block is E-shaped, three stories in height, with no basement. It receives 212 patients, 106 of each sex, in twenty-eight wards, twelve with single beds, six with twelve beds, and six with twenty beds. There are besides a few isolation wards. There are four staircases and one passenger lift. There are twelve slipper-baths and three douches, divided into six groups, each having two slipper and one douche bath in a single room, divided by partitions. There are eighteen water-closets, each group of three with a slop sink being in one room with one window, and all in the body of the building. The twenty-bed wards are axially east and west, the twelve-bed wards north and south, all with windows on both sides. The single rooms face east or west, and the isolation-rooms north. The Liegehallen are three stories high, forming 12-ft. wide verandahs of solid masonry on the south side of the twenty-bed wards, which were thus practically cut off from all sun. There are other Liegehallen in the grounds. There are two chapels in this hospital. The nursing staff consists of twenty-three and a matron. The administration block is separate and is a hollow square on plan, with the engine and boiler houses in the centre of the quadrangle. It contains the staff residences, the kitchens, staff dining-rooms, laundry, cow-stables, etc. The disinfecter is strangely placed in the basement of the staff block. This very modern and complete hospital disregards what we regard as of great importance—viz., aspect, abundant sunlight in all rooms, and detachment of sanitary apartments.

The Volksheilstätte at Krailing, in Bavaria, is more like our accepted type than any other, but it has a basement and three stories. Its plan consists of a centre with two wings at very flat angles. It takes 120 patients. There are thirteen single-bed wards, the

others containing two, three, four, five, and six beds, all facing south-south-east or south-south-west. There are two staircases. Four slipper-baths are provided in one room, and there is one douche-room. Here again the eighteen water-closets are in groups of three in one room with one window, and all are in the heart of the building. There are also in the body of the building rooms fitted with thirty lavatory basins. The nursing staff consists of fifteen. The staff all live in this same building. The Liegehallen are recessed verandahs under the patients' bedrooms of the side wings.

He had an object in mentioning the nursing staff at the various places referred to, first, because it affects the accommodation to be provided, and second, because a member of the recent deputation to the Metropolitan Asylums Board made the suggestion that the staff of nurses need not be large in our sanatoria. The keynote of all these German institutions was concentration with centralisation. Administratively, this was possibly economical, but economy might be attained at the sacrifice of things more important. We in England aim at greater segregation of patients; at the removal of the staff when off duty from the locality of their work to pleasant surroundings; at the isolation of all sanitary conveniences, so as to keep the air of patients' buildings free from contamination.

Now there were varying methods of attaining the objects aimed at. Some advocate the separate hut, some cottages for a few, others building units for twelve to twenty-four, and again others one block to hold a large number. At Pinewood, the King's Sanatorium, and Frimley,* the rooms have generally single beds; at Northwood they have generally eight beds in a ward, but this last is a country branch hospital rather than a sanatorium. The one-bed ward was, he believed, most recommended because one patient was not disturbed by another coughing. There were, however, advantages in having a few two and three bedded wards, as in cases liable to sudden hemorrhage the presence of another person to summon assistance might be of great importance, and, in specially nervous cases companionship might be desirable.

Pinewood, in Surrey, was designed by Mr. F. Jones, and was erected some four or five years ago for sixty-four paying patients, and has a central three-storied administrative block, containing the medical staff residences, offices, consulting-rooms, and dispensary. Two detached two-storied wings at obtuse angles contain in each thirty-two single bedrooms in single file facing south-south-east and south-south-west. Behind the centre, to the north, is another building, containing dining-rooms, kitchen, and offices, and, on the upper floor, the bedrooms for nurses and servants. The laundry block and boiler and engine houses are again to the north.

The King's Sanatorium, designed by Mr. Percy Adams, also for paying patients, accommodates 100, and is somewhat on the same general plan, but all the buildings are attached. The patients are in single-bed wards, facing south, south-south-east, or south-south-west. The dining-hall is in the centre to the north, and the administration is in another range further to the north, with staff residences at the ends.

The Heatherside Sanatorium, at Frimley, in Surrey, belongs to the Hospital for Consumption at Brompton, is for poor patients, and is free. It consists of detached blocks, and provides accommodation for 100 patients. The main building has a central block and four radial pavilions. In the centre are the day-rooms, facing south, the consulting-room, dispensary, matron's rooms, board-room, etc., and here there are four three-bedded wards for patients requiring special observation. Each of the radial pavilions is two-storied, and contains accommodation for twenty-two patients in twelve single-bed wards, two of two beds, and two of three beds. Each floor is entirely disconnected from the other.

As to the cottage type of sanatorium. This usually consists in one or more central administrative buildings, and then many

* See our issue for August 15, 1903, for illustration and description.

† For illustration of chapel see our issue of April 22: last.

detached cottages for patients. A well-known example of such a colony is the Adirondack Sanatorium at Saranac Lake, in New York State. The type of cottage is one with a common sitting-room of octagon form, with two or four bedrooms opening off the room, and separated from it by 7-ft. high partitions. These cottages have been increased year by year to meet demands. The Loomis Sanatorium, at Liberty, in the same State, is another similar institution. These places were for paying patients. It may, however, be affirmed that such villages, for any considerable number of patients, if built of permanent materials, could not in England compete as to original cost with the more compact sanatoria. Cottages were, so to speak, the simplest kind of shelters, with no house-keeping worries, and, given reading and other rooms, to delicate people anxious and willing to submit to medical discipline, they were attractive as residences if the surroundings were pleasant.

The question now in the air was how to erect cheap sanatoria for the million? The answer had yet to be found. We could not get buildings of a permanent character, with all the modern minutiae of sanitary detail insisted on by experts, without paying the price. Could we, however, be content with the type to serve the purpose? If we were content to put up internally with less perfect arrangements and sanitary finishings, then much money could be saved. But we must not ignore the fact that, in permanent general and special hospitals, the curative results under the old internal conditions were not to be compared with those under the most modern conditions. Efficiency with economy was a sound cry, but real economy had generally been found in the most perfect sanitary efficiency of a building. No doubt wood and iron buildings might be erected at a relatively cheap price, and it would be remembered that when fever hospitals were first started they were built of those materials and cost little. One of the advantages claimed for them was the sanitary one, that, after ten or fifteen years, when they were supposed to become infected, they could be burnt down, but experience led the authorities to replace many with permanent buildings costing twice as much, and others, recognised as unfit, were left up because the owners could not face the loss of burning. Now, no infectious hospital, unless for a strictly temporary or emergency purpose, was erected except of permanent material. Would not this experience apply here? A wooden building had to be painted all over every three years. Its normal life, and the life of a galvanised iron building, was one-third or one-fourth of that of a brick or stone building covered with slate or tiles, and yet its sanitary appliances and drains must be as expensive as for the permanent building, and yet their life was terminated with the short-lived wooden or iron receptacle. He doubted if the cost of such temporary buildings, allowing for maintenance, sinking fund, etc., did not, in the end, exceed that of permanent buildings. If the disease be destroyed, permanent germ-resisting buildings would be available for other purposes, while the more porous wooden ones, worn by the action of wind and sun, would be infected and not available for anything else.

Mr. A. C. Scovell, J.P., Chairman of the Metropolitan Asylums Board, said that the choice of site in relation to this disease was of the utmost importance—it was nine-tenths of the battle. Fortunately, within reasonable distance of London, there are large spaces which had not been available or profitable for cultivation which would no doubt be open for selection as suitable sites. The principal question to the practical administrator was that of cost, and Mr. Hall had not given much encouragement in that direction. He had hoped to hear that the suggestion put forward on another occasion could be carried into effect, i.e., that buildings of this class might be erected at a very much reduced cost compared with recently erected hospitals for the Metropolis, but he was afraid that there was very little prospect of that being done. His experience rather corroborated what Mr. Hall had said, i.e., that there was no economy in temporary buildings—buildings erected of material which was temporary. So much of every hospital building must be the same, whether the building was temporary or

not; the foundations, sanitary appliances, sashes and windows, etc., were much the same whether the buildings were temporary or permanent. But he thought that the public were well advised when warned against putting their money into buildings of a really temporary character, for first cost was often the least cost. This question of cost was of vital importance, for upon the aspect it presented to the general public depended the progress which could be made in providing accommodation for those who suffer from tuberculosis.

Mr. H. Percy Adams said that a sanatorium should be more in the nature of a country house than of an institution, and he quite agreed with Mr. Hall that a patient ought to live as much out of doors as in. Therefore, the external design of a building, as well as the view from within, would have a great influence upon the patients. The building should be bright and cheerful, and the lay out of the gardens ought to be carefully considered. Speaking of Mr. Hall's Primley building, he had, he said, been told that a similar building had been erected in Chile. Mr. Adams then gave a description of the King's Sanatorium.

Dr. C. Theodore Williams said that, as to site, it was important to get a somewhat elevated position; on an elevated position there was less exposure to fog and damp, and more chance of getting sunshine. It was important to get sunshine in these buildings, and to see that the wards face the right way. In all designs the provision must be such as to secure an abundant supply of sunshine and fresh air, and, if buildings were erected in such a way that sunshine and fresh air were excluded, we defeated our ends, and there was rather a tendency in the way of making buildings a little too solid. People who did not suffer from consumption lived in tents and huts, and not in mansions and palaces. Allusion had been made to the compact form of sanatoria and the cottage form, and, at first sight, the cottage form seemed a good and reasonable and cheap one, but, when the question was looked into thoroughly, it would be found that they came to much the same thing. In the cottage system there were the separate cottage buildings, and the administrative and machinery blocks, etc.; and in the compact system all the cottages, so to speak, were put together and approached from corridors. The result was much the same, only that in the compact system the cost was lower and the administration easier. He could not help thinking that expense in the provision of sanatoria might be reduced, and he thought so as the result of careful consideration of what had been done in other countries. The German Volk-sanatorium was generally done for about 200*l.* per bed, though they were not all so cheap, and some of the sanatoria for the wealthy cost as much as 750*l.* a bed, which was as costly as any English buildings of the kind; but the average cost of these buildings in this country was from 500*l.* to 600*l.* He found that in the case of two large sanatoria in Denmark the cost was about 187*l.* per bed, and there were some Swiss ones which were very moderate in price. The Germans had tried to and had succeeded in reducing the cost, and he thought the same effort should be made here. He was looking at some Swiss sanatoria the other day at Leysin, where there were three sanatoria, of 120 beds each, and another for poor patients of 120 beds, and this last had cost 16,000*l.*, or about 130*l.* per bed. If that could be done in Switzerland we ought to be able to get what was wanted for the poorer classes for about 200*l.* per bed.

Mr. T. W. Aldwinckle said that the essence of the whole question was the cost of the buildings, and he saw no reason why these sanatoria should cost as much as infectious hospitals, because the cubic space required and the nursing accommodation were not so great. If they dealt with the ordinary type of permanent brick buildings, they could not get them carried out for less than about 300*l.* per bed, and they had to consider whether there were not other buildings—temporary or whatever they liked to call them—which could be built of lighter construction, say, of wood—the outer walls of wooden frames filled in with brickwork on edge, and covered externally with corrugated iron or cement and inside with plaster. That was a light style of

building, which cost considerably less than the permanent buildings, and, being light in character, it required less for foundations; it could be built for half the money—say, 150*l.* per bed—and with proper sanitary arrangements at the same time, and it could be quickly built in times of emergency.

Dr. Heron, having referred to the large number of consumptives in England and Wales, and the large number of those for whom sanatoria were required, said that 200*l.* per bed was too much to pay for a sanatorium. A few years ago he visited places where temporary buildings had been erected, and he found that they could be run up at a cost of about 80*l.* per bed; at Banstead they had been built for less than 50*l.* per bed. The question was whether these buildings would last long, and he was assured that they lasted fourteen to twenty years without giving trouble, and that they required as little attention in the way of repair as the adjoining brick and mortar buildings. As to the comfort of these buildings, he had asked many people who had lived in them—doctors, nurses, patients—and he had heard from them but one testimony, and that was that they preferred to live in these temporary buildings rather than in the usual buildings of brick and stone with which we are accustomed to associate sanatoria. The point he wished to make was that we had to take these poor people who could not pay the cost of their illness and put them in a sanatorium in their own interests and in the interests of the healthy population, and in order to provide this accommodation the cost of building should be kept down. He agreed with what had been said as to sunshine, fresh air, elevated position, good and free ventilation, and if they wanted the best results they must see that these buildings were removed as far as possible from the emanations from towns. There was a considerable amount of evidence to show that sanatoria for consumptives ought not to be placed near the seaside nor in the valleys of rivers. For the air in such positions was moist and damp, and in such air the best results were unobtainable. The higher up, within reasonable limits, a sanatorium was built the better.

Dr. J. E. Squire, C.B., said they were all agreed practically on the principles reviewed by Mr. Hall, but it was in the application that there was the difference. He used to think that the cottage form of sanatoria was the best, and he still thought it better than the barrack form theoretically; but in this country, in view of the large area required for the cottages and the cost of supervision of such, he was now more in favour of the larger and compact buildings. As to the question of permanent or temporary buildings and the question asked by Mr. Hall as to what use the permanent buildings for consumption could be put when consumption was got rid of, by the time that had come to pass it would probably be realised that injuries and most diseases could better be cured in the open air than in the contaminated air of towns, and these large buildings which are now used for consumptives could be used for such purposes, keeping the hospitals of the towns for emergency cases and such cases as could not be removed. He would make a plea in the matter of construction for better ventilation and lighting of cupboards and store-rooms. Where patients' clothes were put, in all probability germs of disease were being put, and sunshine went a long way towards destroying them, and the store-rooms and cupboards required lighting and sunshine as well as the wards. For poorer patients he thought single-bed wards were not appreciated. Such patients were accustomed to living in crowds, and they did not like being put in wards by themselves. Besides, they were more nervous than better educated patients, and they often feared isolation. He thought that the three- or four- or six- or even eight-bed ward was better than the single-bed ward for poorer patients. He endorsed what had been said against the seaside for consumptive patients, and he agreed with what Dr. Heron had said on the subject of cost. It was the great cost of sanatoria which had so long delayed the provision of such buildings for the treatment of the poor. The chief thing that could be accomplished at these sanatoria was the education of the patients, for to effect a cure, unless the cases were taken in the earliest stages, was a matter of years, and if people

in the more advanced stages were kept until they were cured they would have to be kept two or three years, and, of course, that could not be done. If patients could be kept for from three to six months, or even a little longer in some cases, and were educated what to do, then the problem was not beyond the possibility of solution.

Dr. Jones having endorsed the view as to the importance of educating patients and as to the necessity for cheapness,

Dr. C. Reinhardt put forward a strong plea in favour of an entirely different kind of sanatorium from those of which they saw illustrations before them. He held that these buildings were mischievous and a fatal form of trap, in that, being very costly, they were almost prohibitive, and therefore the public authorities were discouraged by the expense which they regarded as inevitable, and many thousands of consumptives were deprived of the treatment. The cost of a single sanatorium of "palatial" character with 100 beds would provide for six chalet sanatoria, accommodating a total of 600, and that the ideal sanatorium consisted of a number of isolated chalets surrounding a central administrative block. He had had experience of both forms of sanatoria, and he found that patients in chalets developed better progress and enjoyed themselves more, and were pleased if allowed to stay in a chalet. When removed to their own homes, many of those able to afford it erected a chalet in their own grounds. The cost of this form of sanatorium was much less than the others; it worked out at about 50*l.* to 60*l.* per bed inclusive of equipment. Objection to the chalet came from theorists, not from those who had had practical experience. He did not agree with the view expressed against the erection of temporary buildings, and, as to sewage disposal, he regarded pipes as an abomination where consumption sanatoria were concerned; he was in favour of the earth disposal of sewage, and the water carriage system ought to be condemned.

Dr. F. R. Walters said that he thought there was an advantage in the cottage sanatorium plan as against the chalet sanatorium plan. Chalets had a great advantage in the matter of quietude, the amount of sunshine they receive, and in ventilation, but they were more difficult to supervise, as Dr. Reinhardt had admitted, and he (the speaker) thought they were less convenient for patients, and he was strengthened in saying that from experience of two chalet sanatoria in England. He thought that the cost of maintenance of wooden buildings had been much exaggerated. As to single-bed wards, it was important in some cases to keep patients from talking, and it was impossible to do that with three or four people in a ward. It was an advantage in some cases to have a few rooms with dressing-room attached, for it was sometimes necessary to have a special nurse in attendance on a patient. Recreation-rooms should be kept away from bedrooms, and as to sunshine, while that was all important, shade was also desirable at times.

Dr. F. J. Wethered said that two classes of sanatoria had to be provided, i.e., those for the poorer classes and those for the well-to-do, and the designs for the two must be entirely different. They had heard about the chalet or hut system, as to which he had spoken to patients who had lived in these buildings, and the great majority of them preferred the pavilion buildings to the chalet buildings. The chalet system was excellent for a small number of patients, but for such a number as 200 or 300 the system failed, owing to the great difficulty of administration. Another difficulty was that patients liked the chalet system in summer and disliked it in winter, and with reason, seeing that they had to go from the chalet to the central building three or four times a day for meals. Sufficient stress had not been put upon the importance of site. The sanatorium should be built on a hill, and the important point was that patients, when lying in bed, should have a pleasant outlook, which should not be obstructed by trees. Exercise in hilly districts, too, was good for people in order to increase the power of the heart.

After some remarks from Mr. Helby, Mr. Lodwidge, and Miss Hilda Josephs (who spoke of the need, if consumption was to be "wiped out" as a disease, for providing sanatoria for the worst cases, so as to prevent

people dying in their own homes and spreading infection in this way),

Mr. A. Saxon Snell said that he was afraid that the convenience of administration was far too much considered in nearly all hospitals, and, in his opinion, it would tend much to the cheapness of buildings, and make them more sanitary, if less attention was paid to this matter, which in many cases meant the convenience of the staff rather than the welfare of the patient. There were several modern hospitals built (or about to be built) with corridors connecting the blocks on all floors—a system which would be utterly condemned were the buildings put up under the authority of the Local Government Board or the Admiralty and other public departments, and yet they were insisted on for the convenience of the staff. In one case he was told that this was necessary, otherwise the matron would have to go up and down stairs in order to get from the surgical side to the medical side. Architects could not be blamed for this, for it was not so much for them to suggest what ought to be done, but rather how things could be done. If the convenience of the staff could be considered less, the chalet system would be more in favour, for theoretically this was the most perfect system we could have, and it was, in his opinion, the cheapest in the end. As to temporary buildings, there seemed to be an idea that the only alternative to brick and stone buildings was wood and corrugated iron; but as to that, he hoped that we should get some hints how to build cheaply with something better, more sanitary, and from the approaching Cheap Cottages Exhibition. In these days of varied building materials we could hope for cheap buildings, but, of course, the difficulty was the by-laws.

Dr. Dudfield said it would be the most economical thing to establish sanatoria throughout the county if the result was to stamp out tuberculosis.

On the motion of the Chairman, Mr. Hall was thanked for his remarks, and a vote of thanks to the Chairman brought the proceedings to a close.

On Saturday a visit was made to the Heathside Sanatorium, Frimley, when Mr. E. T. Hall conducted a large party over the building.

Illustrations.

PORTRAIT OF SIR ASTON WEBB, R.A.

AS has been our custom for some time past (with one or two unavoidable exceptions), we give the portrait of the recipient of the Royal gold medal, the presentation of which at the meeting of the Institute of Architects last Monday is recorded in another column.

We are indebted to Sir Aston Webb for his courtesy in furnishing us with a photograph for the occasion.

SELECTED DESIGN FOR WESLEYAN HALL, WESTMINSTER.

WE give this week the perspective view and plans of the design by Messrs. Lancaster & Rickards, which has been selected in the second competition for the proposed Wesleyan Hall at Westminster.

"The following is the architects' description of their intentions in the design:—

In working out this design, though its proportions and massing have been allowed to develop from the necessities of the case, the form of the large hall being naturally the dominating influence, the expressed desire for a building of monumental character has been kept in view in determining the treatment of the detail.

It has been considered not inappropriate to base the design on the style belonging to the period at which John Wesley commenced his life work; and, though, of course, a building can hardly fail to show some indication of its actual date, it is felt that in this case the influence of the XVIIth century would be discernable.

Applied ornament and sculpture has been sparingly used in view of the austerity of the design, and figure work has been almost wholly avoided as unsuited to the purposes of the building. The series of panels immediately

above the ground-floor windows, extending all round the two principal fronts, is intended to receive the names of those who have taken a leading part in this religious movement. It is suggested that in the middle of Tothill-street frontage a statue of John Wesley should be placed, the recess in the building at this point forming a very suitable framing for such a monument.

The form of the external dome has been decided on with a view of differentiating the building from one of a strictly ecclesiastical character, such as a circular dome is apt to suggest, while, in studying this portion of the design, it has been borne in mind that the whole of the building above the level of the angle pavilions could be seen from points at a considerable distance, such as Westminster Bridge and St. James's Park.

Internal Arrangements.—On the ground floor the four principal rooms are grouped round a spacious entrance-hall, enabling them to be used separately or together, and the committee-rooms placed on this floor are easily accessible from the entrance-hall or from the office entrance in Tothill-street. The ground floor is placed some 7 ft. above the street in order to obtain good light for the basement; the entrance-hall is consequently approached from the vestibule by a broad flight of steps, whilst returning over the vestibule is the grand staircase to the first floor. This is supplemented on either side by the two staircases in the towers, which serve the basement and the assembly-hall galleries, and, being approached both from the vestibule and the street, minimise the traffic in the entrance-hall.

The assembly-hall is placed on the first floor, and is approached through a crush-hall of liberal proportions, while the side corridors communicate with supplementary exit staircases. The exits provided would empty the hall in less than three minutes.

The access to the platform is through the reception-room from the west staircases, which would also be used by the chorus, thus keeping it distinct from the public. It is thought advisable to divide the platform into two sections—one for speakers, and that behind it for orchestra and chorus, with the rostrum for the musical conductor; and both the upper and lower platforms command all parts of the hall.

The access to the vestries or enquiry-rooms can be obtained direct from the floor of the hall or from the side corridors, while the gallery stairs open into waiting-rooms for enquirers, intended to be used in conjunction with these vestries. The tea-rooms in the basement are entered from the lower hall, which is reached from the vestibule by two staircases, close to which ample cloak-rooms are provided. On the west side are placed the kitchen and service-rooms, with a separate staff entrance, while two additional emergency exits are provided. The offices are placed on the west front, with an entrance from Tothill-street; twenty-three are below the committee-room floor and thirty-two above. Accommodation for the librarian and caretaker is provided on upper floors on this west front.

Construction, Heating, and Ventilating.—The elevations would be faced with Portland stone. The entire structure would be of fire-resisting materials, the bulk of the internal construction being of breeze concrete on a skeleton steel framing, supplemented by the use of armoured concrete intermediate fillings, thus securing the utmost lightness with the necessary strength and rigidity.

To ensure the most efficient results as to the heating and ventilation, the "Plenum" system is proposed to be adopted in the halls and some of the larger rooms. The fresh air intake would be arranged in the south tower. A powerful blast fan driven by an electric motor would force the fresh air down the main air duct formed in the well hole of the staircase and terminating in horizontal trunks. Vertical flues would be formed in the walls for conveying the fresh air to the various apartments treated on the "Plenum" system. Corresponding extraction flues would also be formed in the walls for taking away the vitiated air, the extraction of the vitiated air being effected by means of a powerful exhaustor, electrically driven, and fixed on the top of the north tower.

The large assembly-hall would be treated quite independently of the remainder of the building, being provided with a separate fan

and motor fixed in the roof space over north transept, and the vitiated air would be taken from the various points into the dome, and thus pass out through the lantern. The contents of the large assembly-hall could be changed six times per hour, and the other places treated on the "Plenum" system four times per hour."

SCULPTURE AT THE ROYAL ACADEMY.

The two plates of sculpture exhibited at the Royal Academy are given as illustrations in connexion with the article on another page of this issue.

The titles of the works are—Plate I.: A, "The Awakening," by Mr. F. Mowbray Tanman; B, "Sisters," by Mr. E. Roscoe Mullins; C, "Sleep, Nature's Soft Nurse," by Mr. Arnold Wright; D, "Reverie," bronze statuette, by Mr. H. R. Rose-Pinker. Plate II.: E, "Justice," model of group for Liverpool Victoria Memorial, by Mr. C. J. Allen; F, "Homer, the Young Minstrel," by Sir W. B. Richmond; G, "Glory," figure for the Islington War Memorial, by Mr. Bertram MacKenna.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The Edinburgh Architectural Association at a meeting on the 14th inst. resolved to proceed with the proposed exhibition of the photographs and drawings of architectural "Refinements," the study of which Mr. W. H. Goodyear, of Brooklyn, U.S.A., has made in a special manner his own. The Association voted a contribution to the funds of the exhibition, which is expected to be opened in August. Mr. Goodyear has promised to pay a visit to Edinburgh at a time when the Association hopes to bring together architects from different parts of the country for the purpose of discussing the bearing of the researches which will be illustrated by the collection. This exhibition has been made possible by the generous loan of photographic enlargements by the trustees of the Brooklyn Museum, and by Mr. Goodyear's own kindness in offering drawings which are his private property. The exhibition, which has the support of the Royal Institute of British Architects, will be held in the Scottish National Portrait Gallery, Queen-street, *Scotsman*.

COMPETITIONS.

BRANCH LIBRARY FOR GREENWICH.—The Library Committee of Greenwich Borough Council reported on Monday having decided to offer premiums of 25*l.*, 15*l.*, and 10*l.*, respectively, for designs for the building of a branch library on the site of Bexley House. The President of the Royal Institute of British Architects is to be requested to nominate an assessor, the fee for whom will be 50 guineas.

LIBRARY, RADCLIFFE.—In the competition for the best design for Radcliffe's new Carnegie Library, the first premium of 50*l.*, offered by the Radcliffe District Council, has been won by Mr. H. Lord, the second by Mr. Adshad, and the third by Mr. David Bird, all of Manchester. Forty-nine designs were submitted, and Mr. G. H. Willoughby, of Manchester, was appointed assessor. The building is to cost 5,000*l.*, and will be situated in Strand-lane.

BOOKS RECEIVED.

"THE LAW RELATING TO GAS, WATER, AND ELECTRIC LIGHTING. By Lawrence Duckworth, Barrister-at-Law. (Edinburgh Wilson, 1*s.* 6*d.*)

HARSHAM AND ST. LEONARD'S FOREST. *Homeland Handbooks Series.* (The Homeland Association. 1*s.*)

"WAR MEMORIAL, MIDDLESBROUGH.—On the 7th inst. Lieut.-General Sir Henry Maseod Leslie Rundle, K.C.B., K.C.M.G., D.S.O., unveiled the memorial which has been erected by public subscription in the Albert Park, Middlesbrough, to the memory of the local men who lost their lives in the South African War, 1899 to 1901. The memorial, which in design is an obelisk, has cost over 250*l.*, and is of polished red granite from the famous Peterhead quarries in Scotland. It is placed on three steps of hard Yorkshire stone from Pateley Bridge. The height of the memorial is 22 ft. 6 in. The sculptor is Mr. F. W. Doyle Jones, of Chelsea, S.W.

Correspondence.

CONCRETE PUGGING FOR FLOORS.

SIR,—Your correspondents, Messrs. Holman & Goodham, appear to be disappointed that none but district surveyors have joined in this correspondence, forgetting perhaps that a district surveyor sees more buildings in a week than an average architect sees in a year, and therefore should be more competent to give his experience on the point under discussion.

It must be remembered that the primary object of a floor of this construction is fire resistance, if only for a comparatively short period, say, for ninety minutes, and to diminish its efficiency in this direction for other reasons, viz., the risk of dry rot, is losing sight of the primary object. It might with equal force be urged that slab concrete filling be inserted between iron joists, as the wet concrete with its "slop and drip" might cause the iron joists to rust and so weaken the floor.

If the danger from dry rot is as great as your correspondents suggest it would be better to discard the system altogether than run the risk of reducing the efficiency of the floor as a fire resistant in the endeavour to avoid another and secondary contingency.

I repeat that the system of filling in wet concrete between joists of floor has been in use for so short a time, viz., since 1895, that its evil effects, if any, are not yet apparent. But my present experience leads me to the opinion that the danger is more apprehensive than real. A building in course of erection gets very often saturated with wet, wood joists and all, before the roof is on, but no evil effects result, and when once the concrete between the joists is set and dry, and the wet has dried out of the timber, I doubt if any change takes place, and the lime or cement in the concrete acts more as a preservative than otherwise. If, of course, the work were continually subject to alternatives of wet and dry, evil results might follow, even in the case of wood joists without concrete filling.

Very few dangerous cases have arisen from the constant practice of the speculative builder who forms a tiled hall in his desirable residences by filling in concrete or rugging between the wooden joists and placing the tiles on the top, so that the evidence at present on hand does not justify our discarding the practice.

But to risk the efficiency of a fire-resisting floor for the sake of a theory is unwise.

I wish Messrs. Holman & Goodham had accepted my offer to test the primary object, that is, the fire-resisting qualities of their floor, they would have found an ounce of fact worth a ton of theory, especially with the 1½-in. clout nails with which they secure their angle iron to the sides of the wooden joists, and the other little details on which they pleasantly theme, and they would then have the practical experience to assist them in urging the Council to adopt their method of construction in the Amendment to the Building Act.

ELLIS MABLEAND.

"THE VOICE OF THE ASSOCIATE."

SIR,—I venture to suggest, with all deference, that Mr. Leonard Stokes has entirely missed the point of my letter. I may at once say that with many of his remarks my friends and I are quite in accord, though we cannot go all the way with him.

But my object in writing was to draw attention, not to the merits or demerits of this much-vexed question of election to Fellowship, but to the scant courtesy—frequently verging on ungraciousness—with which "the voice of the Associate" (the young Associate at all events) is received at the Institute meetings, whatever that usually highly-nervous person may have to say, or whatever be the subject under discussion.

Probably, as I have said, the Associates have only their own apathy in the past to thank for this, but when signs of a reviving interest are not wanting it is very much to be hoped that the seniors will extend the hand of good-fellowship, and at least accord the junior members the same patient hearing they themselves invariably receive from the back benches. After all, the Associate has not only a right to be heard, but a duty in the matter—at least, so some of us think.

Possibly even in this present thorny controversy a little more free ventilation of the subject might have cleared away many misconceptions, but the risk of something akin to a snub from a fellow member, however exalted, is a strong deterrent to a young spokesman.

It is not a little reassuring to find no indication of this attitude in the letter of Mr. Leonard Stokes, whatever difference of opinion there may be between us.

As we print "Associate's" letter, as we presume he must have in his own mind some reason for writing it; but we must say that, from our own observation at the meetings, we are not aware of the least ground for the assertion that young members, as such, are liable to be snubbed if they take part in the discussions.—ED.

THE ARCHITECTURAL ASSOCIATION.

SIR,—Your correspondent "An Old Stager" takes rather a jaucious view of the Association.

He regrets that they have taken large premises thereby considerably enlarging the usefulness of the Association, and also he remarks that the older members cease to take any interest in the affairs of the Association. A look at the subscription list will, perhaps, convince him of his mistake. He then goes on to object to the Council as at present constituted, and refers to the large number of members who have been elected in the present century. As a matter of fact they amount to the grand total of three members. As regards the sub-committees, nine in number, which contain ten to fifteen members, the names of those elected since the beginning of the century amount to six. THIRTY YEARS A MEMBER.

YORK MINSTER.

SIR,—In your note on Sir Charles Nicholson's letter, have you not overlooked the fact that there were two distinct fires at York Minster—one in 1829, the other in 1840?

The incendiary fire of 1829 destroyed the organ, choir woodwork, and roof, but the nave roof was destroyed by the fire of 1840, which originated in the south-west tower.

As to Mr. Bodley's proposals, if the roof is spreading a little it ought surely to be possible to tie it together internally.

The suggestion of flying buttresses is not a new one—it has been mooted from time to time for many years in the neighbourhood of York, from mistaken aesthetic notions, not structural; and there has never been a lack of specious justification in such cases. Even the late Lord Grimthorpe—but no more of this!

I, and others who think with me, are rejoiced to see you taking the matter up.

ALLEN FOXLEY.

P.S.—Dates are quoted from Raines's introduction to his reproduction of Twopenny's Gothic Ornaments in York Minster (1894).

PADDINGTON INFIRMARY.

SIR,—I note that in the *Builder* of the 10th inst., under the heading of "Contracts," the date for delivery of tenders for above is stated as the 25th inst.; it should have been the 20th inst., as per advertisement.

E. HOWLEY SIM.

A WARNING.

SIR,—A few evenings ago, about 8 o'clock, a person called to see me. Being too unwell to see anybody, my wife interviewed him. He announced himself as Sir Thomas Drew, son of the late eminent Dublin architect, on whose death he had succeeded to the title. I opined at once that he was a swindler, and, as soon as I was able wrote Sir Thomas Drew, whose courteous reply confirmed my opinion. As this individual is, apparently, very anxious to get the hall to himself for a few minutes, he ought not to be left, except in the company of a policeman. Anxious as he was to see me, I have not heard from the gentleman since. W.

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE-STEEL.—XXV.

COAL AND GRAIN SILOS.

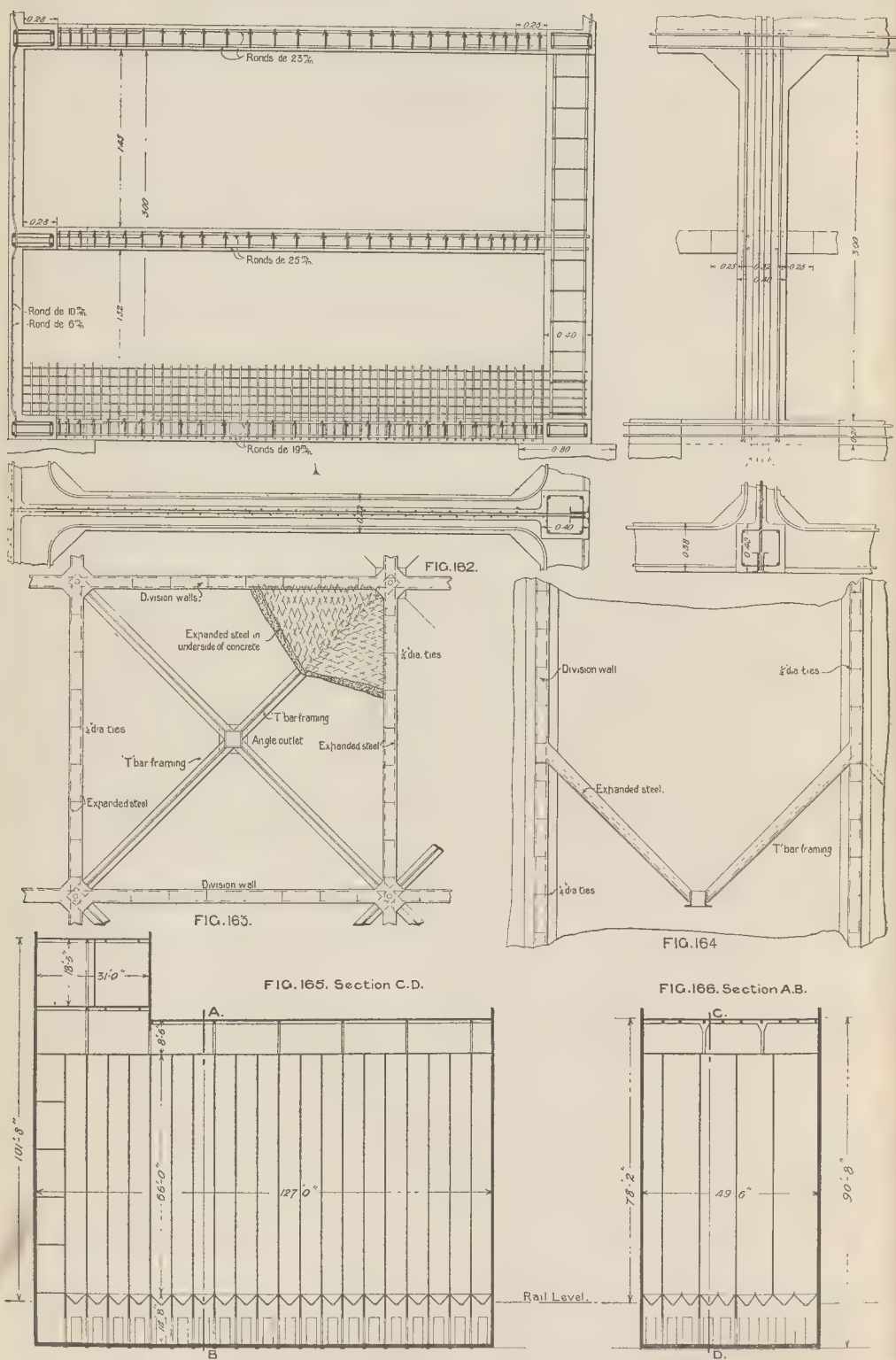
S final examples of concrete-steel construction we will take two or three buildings of the type used for the storage of coal and grain.

Coignet System Coal Silos.—The silos here described were built by M. Edmond Coignet at a generating station, from which electricity is supplied to the Champs Elysées district of the French capital. The works in question are situated on the bank of the Seine at Levallois-Perret, a suburb which, as most of our readers are aware, lies outside the fortifications on the north-west of the city.

The general contract included the construction of a quay on the river side, coal pits, foundations for machinery, and a series of eight coal silos. We shall confine attention to the last-mentioned item.

The eight silos, each with a storage capacity of some 240 cubic metres, really form one building about 50 metres long by 4.7 metres wide, and 12.50 metres high to the eaves.

This building was erected against the open end of the boiler house, so that coal could be delivered directly into the stacking place in front of the boiler furnaces. Each silo has an opening in the lower part of the wall facing the boilers, and the coal is allowed to pour through this, forming a heap



Illustrations to Student's Column.

the inclination of which is governed by the angle of repose of the material.

At the height of 10 metres above ground level, or 2.50 metres below the eaves, there is a floor with an area of about 200 square metres covering the whole range of silos, above each of which a rectangular opening is provided. Coal is raised to the level of the floor by a continuous bucket elevator, and carried along the building by a belt conveyor lifting apparatus by which the coal is automatically discharged through the eight openings in the upper floor. The upper story of the building is of very light construction, as its only purpose is to protect the conveyor mechanism and coal inside the silos from the weather.

Having now sketched the general character and objects of the silos, we will next deal with the details of construction.

At the front of the building a column of 40 centimetres square, between each silo and one at each end of the range, is carried up from the ground level to the upper floor, while at the back the longitudinal and transverse walls are entirely self-supporting. The reason for the columns in the front of the building is that the resistance of the walls is seriously diminished by the openings for the discharge of coal into the boiler house. The walls are built upon foundation beams 40 centimetres wide by 20 centimetres deep, and supported by concrete footings 80 centimetres wide by 40 centimetres deep. The front and back walls have the uniform thickness of 10 centimetres, the transverse walls being 8 centimetres thick. The longitudinal and transverse reinforcement of the foundation beams really form a complete rectangular frame of great strength, and all these frames are connected together in such manner that the whole series of eight frames constitutes a single structure strongly but not rigidly connected, the quality of rigidity being contributed by the concrete surrounding the steel network.

The walls are stiffened by horizontal beams projecting as ribs, 28 centimetres wide by 20 centimetres deep, on the inside of each silo (see Fig. 162). These beams are spaced at vertical distances of about 1.40 metres apart, and are certainly well-adapted to the purpose of strengthening the wall construction. We may point out that at first sight it appears likely that the horizontal projections would suffer injury from the falling coal, but in practice the vertical force of the coal is expended near the centre of each silo, and there is really no risk of damage. Moreover, when the silo has once been filled the normal movement of the coal takes the form of a gradual settlement, and fragments of the fuel settling in the angles above the projecting ribs virtually act as a protective filling.

On the other hand, if the ledges do not become filled up so that the coal slides past them they will probably act to some extent as relieving arches, taking some part of the load from the side walls of the construction.

In one respect the design of a range of coal or any other silos presents two peculiar problems for solution. Firstly, the walls are subject to comparatively small vertical loads, and the forces exerted upon them are chiefly horizontal, being almost entirely due to the outward thrust of the material stored. Secondly, the horizontal forces may vary to a considerable extent from time to time, if the compartments are not equally filled, or if one or more of them should be quite emptied. Hence, the pressure may be exerted in either an inward or an outward direction upon the transverse walls of any one compartment of the series.

The vertical load, comprising the dead weight of the walls, beams, upper floor, and roof, and of any machinery installed on the upper floor, can easily be calculated and provided for. Then the outward thrust of the material stored can be calculated by taking into account the weight per cubic foot of the material, the height to which it is held up, and the coefficients of friction and cohesion of the material. Such calculations are of the same general character as those necessary in the design of retaining walls.

But the complexity of the problem is increased by the uncertainty existing as to the direction and the vertical distribution of the forces to be resisted by the transverse walls. The only safe rule for adoption is to calculate the maximum stress in each direction, and to design the walls so that they shall be safe under any conceivable conditions of loading.

By examination of the wall sections in Fig. 162, it will be seen that this method has been followed in the case of the transverse walls, where two sets of reinforcement are employed, one for resisting tension on the inner side of the wall panels, and the other for resisting tension on the outer sides. In the case of the front and back walls, and of the end wall of the range, only one set of reinforcement is necessary, because upon these pressure can only be exerted in an outward direction.

The horizontal beams also have double reinforcement, so that they may be capable of withstanding stress induced by inward or outward pressure. Further, for the sake of insuring ample rigidity to the whole construction, the duplication of the reinforcement is extended to all the beams, whether subject to alternations of stress or not.

In the construction of the wall panels between the vertical and horizontal members, the reinforcement takes the form of a close network of steel rods embedded in the concrete as partly shown in Fig. 162.

Expanded Metal System Silos.—In the construction of storage bins intended for the reception of coal, grain, or other materials, expanded metal can be used with considerable advantage. The absolute connexion of the strands forming the mesh insures continuity of the reinforcement, and the comparatively small dimensions of the mesh give a satisfactory guarantee that resistance to tension will be amply provided in every part of the concrete.

The outer and inner walls of the compartments are built of concrete having continuous sheets of expanded metal embedded in each side so as to provide for withstanding tensile stresses, whether the adjoining compartments be empty or full, and the two layers of reinforcement are connected by ties formed of 4-in. diameter steel rods spaced 1 ft. 6 in. apart vertically and horizontally, the ends of the rods being bent over to form hooks, which are passed through the meshes of the metal. Figs. 163 and 164 represent the method of construction generally adopted in connexion with expanded metal.

As shown in the drawings, ordinary rolled steel sections are used only in the construction of the hopper and the outlet. Apart from the T-bars forming the angular framework, the hopper is built of concrete with expanded metal near the outer surface, only one layer being required in this case, owing to the fact that the pressure is always exerted in an outward direction.

To ensure the rigidity of a connected series of silos of this type, concrete columns are provided at the corners of the different compartments, as indicated in Fig. 163, and the division walls are securely bonded with the columns by means of strips of expanded metal, about 4 ft. long by 5 in. wide, laid flat at the intersections of the walls and crossing the columns in each direction.

The illustrations here given represent the type of design adopted for an extensive series of silos erected in South America, but they are equally applicable to any requirements, providing the proportions be correctly adapted to the loads determined for any given case.

Hennebique System Grain and Coal Silos.—A large number of granary buildings on this system are to be found in all parts of the world, and many of them have already been fully described in various technical journals. For the purpose of the present article, we select for brief description the silos built at Swansea in connexion with the mills of Messrs. Weaver & Co. Figs. 165 and 166 are longitudinal and cross sections of the building, the main dimensions of which are:—Length 127 ft., width 48 ft. 6 in., height above ground level 90 ft. 8 in. At one end, as shown in the longitudinal section, a tower projects above the general level of the roof. This extension has a height of about 22 ft., and is used as a cleaning tower for grain. There are 100 silos, each provided with a hopper at the bottom for the discharge of grain, the average storage capacity of each compartment being about 70 tons, giving a total capacity of 7,000 tons of grain.

In this building the foundations, external walls, columns under the silos, the silos themselves, the staircases, and the floors and roofs are constructed entirely of concrete-steel. The thickness of the external walls is 12 in. at the bottom and 4 in. at the top; the interior divisions forming the separate compartments

or silos are 5½ in. thick up to the level of the hoppers and 3 in. thick above.

As the site consisted of extremely unstable material, a general sill or foundation plate of concrete-steel was formed beneath the entire building, and connected with the walls and other members by means of the steel reinforcement, as well as by the monolithic concrete construction. Bearing in mind the fact that the floors and interior partitions are similarly connected with the walls and with each other, it will be realised that the complete structure really constitutes a huge box girder of immense strength and rigidity.

On completion of the works, a test was made in the presence of Mr. H. C. Portsmouth, the architect, by gauging one silo when all the surrounding compartments were empty. The surrounding compartments were then filled with grain to the height of 66 ft. above the top of the hoppers, and the dimensions of the centre silo were again taken, at three points, 17 ft., 34 ft., and 61 ft. respectively from the top. No deviation from the first dimensions was observed, thus demonstrating the rigidity of the partition walls.

Among other structures of similar character may be mentioned the Dunston grain silos, near Newcastle-on-Tyne; the grain elevators at Strasburg, with a capacity of 930,000 bushels; and the silos at Genoa, comprising 204 rectangular compartments with a total capacity of 1,120,000 bushels of grain. Coal silos of the same general type of construction have been built at Portsmouth and Southampton, the storage capacities of these structures being 2,400 tons and 4,000 tons respectively.

Conclusion.—This article closes the present Student's Column series, wherein we have limited the consideration of concrete-steel structures to types which are representative of the daily practice of our readers. The objects of the series have been to show that all the requirements of ordinary building construction can be adequately met by the employment of concrete-steel, and, further, that various difficult problems can be solved in a satisfactory manner by the aid of the same material. If space had permitted, mention might have been made of other structures, such as reservoirs, water towers, water and drainage conduits, wharves, quays, jetties, bridges, and viaducts; but the attempt to cover too much ground would have involved the omission of matter which we judged to be of more immediate interest to those chiefly concerned in architectural building construction.

We hope that the particulars given may prove of some practical service to our readers, and may serve to direct further attention to a building material which readily lends itself to existing forms of architectural design and perfectly complies with all essential requirements.

LABORATORY STONE TESTS.

In his article on the "Decay and Preservation of Stone-work," in the last issue of the *Builder*, Mr. Purchase points to the defective condition of the stone-work of the Houses of Parliament as evidence that laboratory tests of stone are of little value.

In connexion with this matter it should be noted that:—(1) Sixty-six years have elapsed since the Committee on the selection of stone for the Houses issued its report. Since 1839 many useful tests for stone have been devised—e.g., the crushing and other tests used by Mr. T. Hudson Beare (*Proceedings of the Institution of Civil Engineers*, 1892).

(2) The comparatively rapid action of London "smoke" upon the carbonates of lime and magnesia, converting them into crystallisable and soluble sulphates, has only become generally recognised since the Houses were built. Sulphate of magnesia (Epsom salts) has a much greater solubility in water than sulphate of lime. Modern science would reject any stone consisting largely of magnesium carbonate for buildings of national importance in such an atmosphere as that of London.

(3) In 1861 a Committee appointed to report upon the decay of the Houses reported that the selection of the stone actually used "was left to persons who admit that they had little or no prior experience of this description of stone, though they evidently entertained suspicions of the durability of some of it which they were employing."

Under these circumstances the condition of the Houses of Parliament cannot justly be cited as an argument against the utility of laboratory tests.

H. F. HILLS.

FIRE PROTECTION IN LONDON.

SIR HENRY ARBUTHNOT-FITZGERALD'S Select Committee of the House of Commons resumed its consideration of the London County Council's Building Act Amendment Bill on Wednesday.

At the opening of the proceedings, the Chairman of the Committee asked Mr. Fitzgerald, K.C. (who appeared for the promoters), whether his attention had been called to the Committee which had been appointed on the previous night to inquire into the question of protection of life from fire. He (the Chairman) thought it somewhat affected the present Bill.

Mr. Fitzgerald replied that his attention had not been drawn to the Committee in question, but he was now given to understand that the Committee's inquiries would extend to the whole of the country.

The Chairman said that that was so, but he thought he would mention the fact because counsel had said that there was a possibility of the London County Council promoting a more extreme Bill next year.

Capt. Hamilton, the Chief of the Fire Brigade, then continued his evidence under examination by Mr. Bushe, K.C. He said that projecting shop fronts were very dangerous obstacles in the case of the building being on fire. The projecting portion prevented the use of the ordinary fire escape. Such shops should always have fire-resisting roofs, and provision for this was made by the Bill. He replied to a question put by the Committee, witness repeated his statement that in the majority of cases there should be an alternative means of escape to a building. He summarised the provisions of the Bill as follows:—

—From the ground to 25 ft. in height there would be no need to provide any special means of escape. In the case of buildings between 25 ft. and 50 ft. every building would have to have access to the roof or parapet, and in the case of buildings 50 ft. and over each story should have a separate escape.

Mr. Pembroke Stephens, K.C. (for the Royal Institute of British Architects), in cross-examining witness, endeavoured to show that the Fire Brigade was not efficient. Witness admitted that the London Brigade had no water tower; but added that they used the longest of their ladders for the purpose. Long ladders were most awkward things to handle in London streets. The Brigade had 120 pomper or hook ladders. Counsel pointed out that many of the provinces had engines of a much greater pumping capacity than those in the London Brigade, and witness said that that was quite true. He was of opinion that beyond a certain size the pumping capacity of an engine did not necessarily increase the efficiency of a brigade.

The Committee adjourned.

OBITUARY.

MR. MANSENGH.—We announce with much regret the death, on June 16, at No. 51, Fitzjohn's-avenue, Hampstead, of Mr. James Mansegh, C.E., aged 71 years, of No. 5, Victoria-street, Westminster, who was senior member of the firm of Messrs. James Mansegh & Sons, and had attained a high position amongst the leading sanitary and water-supply engineers of the day. He was elected an Associate of the Institution of Civil Engineers in 1859, Member in 1873, Vice-President in 1895, and President in May, 1900. In 1892 he was appointed a member of the Royal Commission of Enquiry into the Water Supply of London; in May, 1897, he was Chairman of the Waterworks, Sewerage, and Gasworks section of the Engineers' Conference; in 1901 he was nominated a member of the Board of Visitors, Cooper's Hill Indian Engineering College, and in June of that year was elected a Fellow of the Royal Society. He was a member of Council, Institution of Mechanical Engineers, and of the Finance Sub-Committee of the Engineering Standards Committee. His professional services were frequently in request for giving evidence before Parliamentary committees; he enjoyed an extensive practice as umpire and arbitrator, mainly in relation to the transfers of water and gas undertakings to public authorities, and was largely employed in advising upon and drawing up projects for water-supply, sewerage, and drainage at home and abroad. Mr. Mansegh, the second son of Mr. John Burkit Mansegh, of Lancaster, was born on April 29, 1834. He had his earlier education in his native town, and at Queenwood College, Hampshire, where Professor Tyndall was his master for mathematics and surveying. After serving his apprenticeship to Messrs. Mackie & Lawson, of Lancaster, he went, in 1855, to Brazil, where he carried out some surveying for the construction of the Don Pedro Segura railway line from Rio Janeiro into the interior. On returning to England in 1859 he became a partner of Mr. Hugh U. Mackie, City Engineer and Surveyor, Carlisle, and carried out a sewerage scheme for that city, with a sewage farm—the first in England. In 1862 he started in business as a contractor and contractor's agent for railway

and sewerage works; four years afterwards he entered into partnership with the late Mr. Lawson, in Westminster. In 1892 the Corporation of Birmingham appointed Mr. Mansegh as engineer for the scheme to supply the city and its environs with water from the rivers Elan and Claerwen, in the counties of Cardigan and Radnor; the Elan Valley water-works were opened in July last, and the whole of the engineering work, now nearly completed, was carried out by him. Of the other more important undertakings entrusted to him and his firm's direction and superintendence, we should mention the schemes for supplying water to Tynemouth (1899-1901), Stockport, Worthing, Carlisle, Clevedon, Somersetshire, and Rochford Urban District Council, together with schemes for the Tees Valley and Truro Water Boards; sewerage works for the Corporations of Plymouth, Derby, Coventry (Whitley, Willenhall, and Coventry), Maidstone, with sewerage disposal and other works at Allington for bacterial treatment; for West Ham (with Mackie), Exmouth, Church Stretton Urban District Council, Cuckfield Rural District Council, Mountain Ash, co. Glamorgan, Urban District Council; a surface water drainage system for Andover; and, last autumn, their report upon the scheme of the Leeds City Engineer in favour of extensive treatment works at Gateforth. Mr. Mansegh was appointed consulting engineer in respect of measures for the complete sewerage of the city of Aberdeen as propounded by Mr. William Dyack, M.Inst.C.E., Burgh Surveyor, under an Act obtained in 1899; and he was employed in the same capacity for the construction of the Blos Tarn reservoir. As engineer to the Corporation of Lancaster he constructed their reservoirs at Abbeystead and Damas Gill, and in 1882 he read a paper to the Institution of Civil Engineers upon "The Lancaster Waterworks (Extension of 1874)," for which he was awarded the Telford medal and premium; in 1880 he delivered at the School of Military Engineering, Chatham, a course of lectures upon well-sinking and boring, and prospecting for water. In 1876 he prepared the gravitation scheme of the Stockton and Middlesbrough Water Board; and as engineer to the Gravesend and Milton Waterworks Company he carried out various works in 1898-9. In 1893 Mr. Mansegh was appointed consulting engineer for the Burrat works for the water supply of Plymouth, as carried out by Mr. Edward Sandeman, M.Inst.C.E.; in 1896 he made a report upon the drainage of Plym, in pursuance of which a deep-sea outfall sewer and other works were agreed upon; and in 1900 he was instructed to prepare plans for draining the low-lying lands at Laire-green. In 1889 Mr. Mansegh went to Australia, and was instructed by the Government of Victoria to frame a scheme for sewerage disposal for the Melbourne metropolitan district, which contains twenty-three towns, and extends over an area of 134 square miles with Melbourne in its midst. In 1895 he visited Toronto to advise upon the works by which water is pumped from Lake Ontario, by gravitation, from Lake Simcoe—a distance of about fifty miles. In the winter of that year he was officially commissioned to go to Ceylon in order to report upon the sanitary condition of Colombo, for which city he prepared a scheme of drainage. In 1898 he accepted an invitation of the Government of Burma-Pesth to join a commission of Hungarian and German engineers and professors for examining the waterworks there, some misgivings having arisen as to their efficiency. Mr. Mansegh was professional adviser to the Local Government Board in framing the London Water Transfer Act, and acted in that capacity in respect of measures for water-supply or sewerage for Malta, Singapore, Philadelphia, Port Elizabeth, Cape Town, and Antigua. During the past few years his two sons, Mr. Ernest Lawson Mansegh, and Mr. Walter Leathly Mansegh, have been associated with him in practice. On the occasion of his being presented with the freedom of Lancaster, on March 24, 1903, Mr. Mansegh spoke of the influence upon his career derived from his association in his school days with Sir Edward Frankland and Professor Tyndall, who, he said, had given the bent to his own life-work.

MR. LISTER.—The death, on June 18, is announced of Mr. Thomas Lister, aged ninety-six years, of Gainsborough. He was the son of a stonemason, of Wath, near Doncaster, and having worked for a while at his father's trade, he was subsequently employed in the construction of the railway from Liverpool to Manchester, and built several bridges on the London and Birmingham Railway for George and Robert Stephenson, joint engineers of that undertaking. He was subsequently employed in the construction, sixty years ago, of a portion—in Lincolnshire—of the present Great Central Railway, and then set up in practice as an architect and surveyor in Gainsborough, where he also embarked in business as a ship-builder, without, however, giving up his qualifying his occupation as a civil engineer. MR. E. E. ADSEHEAD.—We regret to announce

that Mr. Edward Egerton Adsehead, formerly Borough Surveyor and Waterworks Engineer of Macclesfield, died at his residence, Lark Hill, Cottage-lane, on Saturday morning last week.

GENERAL BUILDING NEWS.

WINCHESTER CATHEDRAL.—Regarding the subsidence of the south side of the east end of Winchester Cathedral, the architects are now satisfied that there is a sufficient thickness of gravel underlying the peat on which the building was raised to enable underpinning to be carried out. Some weeks ago an excavation was made on the south side of the east end to ascertain the state of the foundations. Streams of water were then discovered to be flowing beneath the Cathedral, but at a depth of 16 ft. a stratum of gravel was struck. This was bored for a distance of 5 ft., and there was every indication of its continuing for a much greater depth. Mr. Jackson, the diocesan architect, who was called in to consult with Mr. Colson, the Cathedral architect, now wishes to have an expert engineer called in to advise as to the best means of dealing with the danger, and such an expert will be engaged. It is estimated that to render the east end quite safe an expenditure of several thousand pounds will be necessary. Of course, the damage done can never be made good as before; all that can be done is to prevent its becoming worse. Briefly, what has happened is that the streams flowing beneath the Cathedral have gradually sapped the foundation on the south side (the streams flow from north to south), with the result that the south side has sunk. This has thrown the arching out of equilibrium, and the consequence is that everything tends to make the damage worse, the weight of the roof and walls, for instance, combining to press the south wall outwards. The pressure of the displaced masonry has been so great in some places that the solid limestone has flexed like wood without breaking. This can easily be seen while looking from the south aisle of the nave straight into the south aisle of the east end, the arching of the latter being forced down, several inches out of place. Underground the damage is even more apparent, the groining in the crypt having sunk so badly as to necessitate extensive shoring with timber balks. It is thought that there will have to be a complete underpinning of the south side of the east end; buttresses erected along the walls to prevent bulging and collapse; and the massive ties fastened through the walls to keep them together.—Times.

ST. NATHANIEL'S CHURCH, PLATT BRIDGE.—The Church of St. Nathaniel, Platt Bridge, was consecrated on Saturday last by the Bishop of the Diocese. The church is in the Early English style, adapted to the materials used, which are red pressed bricks from Bunton, with moulded terra-cotta for the more ornamental parts. There are three entrances through the grounds of the church, the one under the tower being available for the main building and for the morning chapel. On the south side of the church a tower has been erected 24 ft. square and 95 ft. high. Provision has been made for a clock and a peal of bells. The total length of the church is 120 ft., and the breadth 86 ft. in the widest part. The interior of the church contains a nave 77 ft. 6 in. long, and 26 ft. wide, a chancel 31 ft. long, with a width of 24 ft. On the south side of the chancel there is a morning chapel 24 ft. 6 in. long, and 18 ft. 6 in. wide. On the north side there is an organ chamber, choir vestry, and clergy vestry. On the north and south sides of the nave there are aisles 12 ft. 6 in. wide, and running the whole length of the nave. The nave of the church is 32 ft. high to the eaves, 51 ft. to the ridge, and over the nave, chancel, aisle, and morning chapel there are open timber roofs. The church is heated with hot-water pipes, and lighted by gas. The contractor is Mr. Isaac Dilworth, of Wavertree, Liverpool, the amount of his contract being 8,700*l*. The heating and gas lighting was carried out by Messrs. J. R. Cooper & Sons, Liverpool. The glass in all the windows was made and fixed by Messrs. Williams Bros. & Co., of Liverpool, Chester, and London. The chancel pavement of black and white marble slabs, was carried out by Messrs. John Stubbs & Sons, Liverpool. The pulpits are of carved Caen stone, with marble and alabaster pillars, the font is carried out in similar materials, and to match the design, and both were executed by Messrs. Jones & Willis, Ltd., of Birmingham. The window in the morning chapel represents the "Dignity of Labour," and was by Messrs. Williams Bros. & Co. The architects for the work are Messrs. George Bradbury & Sons, Liverpool.

ALTERATIONS, ETC., LANTARNAM ABBEY.—Alterations are now being carried out at Lantarnam Abbey. The work is being effected under the superintendence of Mr. C. B. Fowler, architect, Newport. Lantarnam Abbey is erected out of the materials and on the site of the XIIIth century Cistercian abbey which flourished at Lantarnam. Very little information is obtainable about

the abbey, but, from the remains found of mullions, window-heads, etc., the building must have been a priory, and the remains are similar to those found at Cardiff Castle, which the Franciscans had a friary. In the reign of Elizabeth the abbey became the property of William Morgan, grandson of Sir Thomas Morgan, of Penecod, and, at a later date, the property passed into other hands. All that now remains of the abbey are the main walls, several mouldings, pieces of columns, window-heads, two memorial slabs, and the monk-house near the pond. In 1856 the abbey was renovated by Mr. Edmund Blunt, at a cost of 60,000*l.*, and Mr. Clifford Cory has also spent much money on improvements.—*Western Mail.*

FREE LIBRARY, MAYBOLE, N.B.—A new Carnegie Free Library is to be erected in Maybole, at a cost of about 3,400*l.* The building contains two apartments on the ground floor, besides entrance-hall and men's lavatories; on the first floor are two similar large rooms, besides a ladies' room and lavatory, and a lavatory for the staff. The four large rooms will be used for reading-rooms and lending and reference libraries, also recreation. The first floor is of fireproof construction, and is approached by a wide stone stair, rising from the entrance-hall. A small spiral stair connects the rooms on the ground and first floor so as to bring them more directly under the control of the staff. Mr. J. K. Hunter, of Ayr, is the architect.

CONGREGATIONAL CHURCH FOR SUTTON-IN-ASHFIELD—The foundation-stone of a new Congregational church, situate at the junction of Victoria-street and High-avenue, Sutton-in-Ashfield, was laid. Messrs. Baines & Son, of London, are the architects, and the contractor is Mr. J. Greenwood, of Mansfield. The building is in late Gothic design, freely treated and faced externally with red dressings, facing bricks, with Derbyshire stone dressings and tracery windows. At the south-east corner there will be a square tower, terminating in a spirelet and weather-vane, the height to the top of the vane being 80 ft. Besides the main front entrance to the body of the church there will be two front entrances—one in the tower, and one in the opposite wing—giving access to the galleries by means of fireproof staircases. A separate staircase in the rear leads to the choir and organ-chamber in the apse behind the pulpit. There will be a vestry for the minister, and another for the deacons. The ground-floor seating is circular, the choir hearer thus directly facing the minister. The accommodation on the ground floor is 436; galleries, 288; choir, 40; total, 764; or a mixed congregation of 850. The estimated cost of the church, site, and alterations is 5,500*l.*

FREE METHODIST CHURCH, WALSEND.—The foundation-stones of a new church at Walsend for the United Free Methodist Church, Fildes-street, have just been laid. The new building is a complete church with nave, aisles, and transepts seated for 700, and a large block of buildings to the north as a social centre. The principal entrances are placed in the south front, entering from Buddle-street, and giving access to vestibules with cloakrooms. The staircases to the galleries are to the east end of the vestibules. The western staircase is carried up as a tower. Each staircase has separate entrance or exit doorways, and there are also doors of egress at the back on both sides of the church. The organ-chamber and choir gallery are placed at the north end of the church immediately behind the pulpit. There is seating accommodation in the choir gallery for over fifty, and access is obtained to this gallery by stairs in the back building also communicating with ladies' room and choir vestry, etc., on the first floor. The back buildings on the ground floor contain vestries for minister and stewards, a church parlour and classroom, with lavatory and cloakroom. The whole of the buildings will be built in brick-work with red pressed brick facing bricks and stone dressings. The floors of the church and all vestries, etc., on ground floor will be laid with red wood-block flooring on a layer of Portland cement concrete. The church floor is laid with a rise of 8 in. from the transepts to vestibule. The lavatories, porches, and corridors will be laid with cement flooring finished red. The roofs throughout will be covered with Bangor slates. The heating will be by low-pressure hot-water system of pipes and radiators carefully arranged. The lighting will be by electric installation. Messrs. Badenoch & Bruce, of Newcastle, are the architects; the contractor is Mr. James MacHarg, of Walsend; the heating has been placed in the hands of Mr. Symington, Newcastle; and the electric lighting will be by Messrs. Reid, Ferens, & Co., Newcastle.

CHURCH, SLEEKBURN, NEAR NEWCASTLE-ON-TYNE.—The foundation-stone has just been laid of a new church at Sleekburn, near Bedlington Station. The church, designed in the Perpendicular style by the Diocesan Architect and

Surveyor, Mr. A. B. Plummer, is being built with the Bedlington Colliery Company's bricks by Messrs. J. Goulding & Son, builders, of Waterlool chamber, and the nave, aisles, chancel, and organ built; the vestry and tower are now being proceeded with at present; and the present contract does not include the heating apparatus. The two aisles are to be divided from the nave by seven arched arcades, over which are seven triplet clerestory windows. The east and west windows are each to have five lights and perpendicular tracery. There will be two two-light traceried windows in the south hall of the chancel. The vestries to the north and the aisles will have cusped triplet windows. The nave, chancel, and aisles are to have open timbered roofs. Main entrance doors, with inner wood porches, are to be at the south, west and north-west corners of the two aisles. An outer porch or entrance to the south doorway will be formed when the tower is built. The nave and aisles combined will be 45 ft. 8 in. wide, and the length will be 75 ft. The chancel is to be 35 ft. by 21 ft., with organ chamber in addition. A bell turret or a belfry is to be constructed over the west end of the nave. The interior piers and all aisle arches, door and window arches, mullions, buttresses, weatherings, water-tablings, quoins, and gable crosses will be of stone.

R. C. CHURCH, LOUGHGLYNN, CO. ROSCOMMON.—The foundation-stone of the new church of St. Loughglynn, Co. Roscommon, was recently laid. The new edifice will be in the Gothic style, and the total length of the nave will be 106 ft. Local limestone will be utilised in the construction of the building. The work is being carried out by Messrs. Courtney & Co., Belfast, from the plans of Messrs. Wm. H. Byrne & Son, Dublin, and the estimated cost is 8,000*l.*

WESLEYAN METHODIST SUNDAY SCHOOL, NEWBURN.—The new Sunday school which has been erected for the Wesleyan body at Newburn was opened recently. The building, the estimated cost of which is 2,300*l.*, is adjacent to the church. The contractors for the new school were Messrs. Brown & Bell, Newcastle, the architects being Messrs. Marshall & Tweedy. Externally the building is of deep red-faced bricks from Penshaw, and the windows and doorways have arched stone heads. The interior has dado of wood stained green; the roof work is stained dark brown oak, and the platform is surrounded with brass rails. The side being on a slope, advantage has been taken of this to introduce an infants' room partly in the basement. On the ground floor of the hall, with seating accommodation for 500 people, a gallery being arranged with staircase approach. Vestries complete the ground floor space available. Corridors connect the church buildings with the new portion. The sub-contractors for the work were: Messrs. Emley & Son, heating; Mr. E. Byles, lighting; Messrs. Bainbridge, chairs, all of Newcastle; Messrs. Stockdale, Gateshead, furnishing; Mr. Rutter, Stockington, painting; the Ceramic Art Company, Stoke, china; and Messrs. Thompson & Snee, stained glass.

ROYAL VICTORIA SCHOOL FOR THE BLIND, NEWCASTLE.—Sir Walter R. Plummer, M.P., recently opened the new school buildings at the Royal Victoria School for the Blind, Benwell Den, Newcastle. The new premises, which have recently been completed by Messrs. R. Veitch & Sons, from the design of Mr. James W. Thompson, architect, of Newcastle, are situated below the Laing Recreation Hall, with which they are connected by a covered passage. On the left of the boys' entrance are three small music-rooms. A door on the right opens into a large central hall, which is lofty, and lighted by clerestory windows. On each side of the hall are three classrooms, each adapted for the various kinds of education imparted. The large hall is used principally for singing and drill. The new buildings, together with new lavatories and baths for the boys, have been constructed at a cost of 5,670*l.*

UNIVERSITY COLLEGE, READING.—The foundation stone of the new University College buildings was laid on the 7th inst. In order to form the approach to the buildings the scheme contemplates the removal of the house known as "Greenbank," now temporarily occupied by the Department of Music. Its removal will enable a direct embayed entrance to be constructed, and from its gates a broad avenue, with the old red building on the right and the Acacias Building on the left, will lead to what will some day be the principal facade of the college. This facade will reach across the full breadth of the site from east to west. On the west it will terminate with the hall, and on the east with the library. The central portion of communication will radiate. External corridors will connect it with the hall; eastward a corridor will connect it with the library, and with the studios, laboratories, and workshops in rear. Northward two passages will connect the central lobby with the old red building, devoted to literary teaching, and with the Acacias Building, the upper floor of which is devoted to the library and reading rooms, while the ground floor has been permanently appropriated for staff common rooms. In rear of the central portion of the facade there is a lecture hall, capable of seating 250

persons, and having over it a roof-lighted room for the teaching of building construction, etc. This central portion will also house the administrative headquarters. Here will be the Chamber for the Council and the Academic Board, the principal's rooms, the registrar's room and offices, as well as the central cloak-rooms, and rooms for teaching purposes. The hall will thus ultimately be reached via the principal entrance, central lobby, and western corridor. Inside, it will measure 100 ft. by 48 ft., exclusive of a deep apse at the southern end designed for an organ. The hall, like the whole of the facade, will be built of thin bricks of a deep red tone, with stone facings, and the roof will be tiled. There will be a barrel ceiling of fibrous plaster, with lights in some of the panels issuing from dormers in the roof. The walls of the hall will be panelled in oak to a height of 8 ft., and above the paneling the walls will be faced with brick and stone. The floor and platform will be of oak. The hall will hold 1,000 people. Throughout the Council has felt that the welfare of a college organised in numerous departments required the early erection of a college hall. No less imperative is the necessity of erecting new laboratories, studios, and workshops. These buildings for art, physics, botany, chemistry, zoology, agriculture, and manual work will be undertaken almost immediately. They will occupy a large portion of the paddock in rear of the College garden. The buildings will be arranged in a series of blocks or pavilions, each connected with the other by a broad central corridor. It has been felt necessary to postpone for the present the erection of the central administrative portion of the main facade. A temporary home for the administrative headquarters has been found in the old red building. The scheme contemplates the erection of workshops for technical work, the erection of the British Dairy Institute at the end of the paddock, and it is hoped, of a gymnasium, towards which 100*l.* has been subscribed. The contract for building the hall has been given to Messrs. T. H. Kingler & Sons, of Oxford. The adaptation of Portland-land and the Acacias has been carried out by Messrs. Collier & Catley, Messrs. Boyd & Murley, and Messrs. Calias, Sons, & May, Ltd., all of Reading. The heating arrangements have been carried out by Messrs. Verners, Pfeiderer, & Perkins on the high pressure system. The architects of the new buildings are Mr. W. Ravenscroft and Mr. C. Steward Smith, both of Reading.—*Reading Mercury.*

SCHOOL, LINCOLN.—The school premises erected on Monk's-road, Lincoln, for the education authority, were opened on the 15th inst. The school has been erected east of the Arboretum. The estimated cost of the buildings, furniture, fittings, and architect's commission, including contingencies, was 7,770*l.* The schools are planned to accommodate 440 children, namely, 310 girls and 130 boys on the ground and first floors respectively of a two-storied block, and 320 infants in a detached one-storied block. A vacant site is left between the building and the Arboretum, and the building now erected forms only a portion of the whole scheme. Though planned as a two-department school to accommodate boys and girls only, a portion of it will be occupied by infants also until the scheme is completed by the erection of the one-storied infants' block mentioned above. The total cost of the buildings is 620,000*l.* There are provided in twelve class-rooms, ten of 50 places each, and two of 60 each. Three adjoining class-rooms on each floor are divided by folding partitions, so that two large rooms may be obtained if desired. Four rooms are provided for the teaching staff, and there are four cloak or store rooms. The heating is by low pressure hot water by means of radiators. The plans of the building were prepared by Messrs. W. Watkins & Son, architects, Lincoln, and were selected in competition among Lincoln architects. The builders were Messrs. W. Wright & Son, of Lincoln.

WESLEYAN CHAPEL, CONSTABLE BURTON.—The foundation-stones of a new Wesleyan Chapel at Constable Burton, Wensleydale, were laid on the 14th inst. The plans were prepared by Mr. A. G. Dalsell, Halifax. The cost of the building will be about 560*l.* The building is to consist of stone, with freestone facings and Gothic windows. The length will be 27 ft. by 18 ft. 6 in. wide, and about 16 ft. high, with a schoolroom 12 ft. square on the east side. The chapel will accommodate 75 people, but with the school thrown open there will be accommodation for about 200. The masonry work will be done by Mr. Thomas Handley, Raygill, Sedburgh; the joinery work by Mr. H. Naylor, Halifax.

CHURCH, FRISTONS, BRISTOL.—The Bristol Mosaic and Terrazzo Company ask us to mention that the terrazzo and Roman mosaic floor in this church, mentioned in our last issue, was laid by them.

CENTRAL SCHOOL, PETERHEAD.—For some eight or nine months past the Central School (formerly the Academy), Peterhead, has been undergoing alteration and enlargement from plans by Mr. Arthur Clyde, architect, Aberdeen. The scheme of reconstruction has embraced the addition of another story to the old school, and an extension of two floors

northwards. In plan almost square, the reconstructed building now approaching completion, measures each way about 100 ft. Near the middle of the east and west sides are situated the entrances for girls and boys respectively, each opening into a cloakroom, with lavatory attached. By means of wide folding doors the cloakrooms communicate at each end with a central hall, 58 ft. by 30 ft. wide, and entering directly off the hall on each side is a range of four classrooms. From the cloakroom in connexion with each entrance a staircase leads to the upper floor, a broad landing giving access to a gallery 6 ft. wide, which runs round the four sides of the hall, while opening off the gallery is a series of four classrooms on each side, the arrangement corresponding precisely to that on the ground floor. On the first floor also are retiring-rooms for the assistant teachers, messanine floors providing on one side of the building in proximity to the entrance a retiring-room for the headmaster, and on the other side a music-room, as well as the necessary stores, cleaners' closets, etc. Altogether in the sixteen classrooms, provision is made in the school for about 1,000 children. The contract price of the reconstructed building, including new offices, playgrounds, enclosing railings, etc., is under 5,000l. The school will be warmed by a system of low-pressure hot water, with radiators. The contractors for the several works are as follows:—Masons, Messrs. W. Stuart & Son, Peterhead; carpenters, Messrs. Dickie & Co., Peterhead; plumber, Mr. J. Ferguson & Co., Peterhead; plaster, Mr. Shand, Peterhead; painter, Mr. A. Ferguson, Peterhead; heating, Messrs. Milne & Robb, Peterhead; and electrician, Mr. McDonald, Aberdeen.

ST. MONICA'S MISSION HALL, NEWCASTLE-ON-TYNE.—The foundation-stone has just been laid of this building, which is to be built in Wingrove-road. The structure will be built of Glosburn stone and red pressed brick, in the Gothic style. The dimensions of the hall are 62 ft. 6 in. long and 34 ft. 6 in. wide. Seating accommodation will be provided for about 250 persons. By means of folding partitions, it is arranged that, when services are not being held, the chancel may be cut off, and the body of the hall can thus be utilised for other purposes. The entrance porch to the main building will be in Wingrove-road at the south-west end, and inner swing doors will give access to the hall. The main room will be divided by a folding partition, so that at any time it can be converted into one room 34 ft. long by 14 ft. wide, suitable for meetings, etc. Another corridor will give access to the vestry or committee-room. Below the vestry there will be a heating chamber, and the premises will be warmed by means of low-pressure hot-water apparatus. The windows facing the two front streets will be glazed with leaded glass of a light-green tint. The contract for the work has been let to Mr. Edward Weatherley, of Newcastle, and the designs have been prepared by Mr. Karl B. Spurgin, architect, of Newcastle.

RAILWAY MISSION HALL, READING.—The foundation-stone of the new mission hall, Chatham-street, Reading, was laid by the Mayor on the 1st inst. The buildings are being erected by Messrs. Wheeler Brothers from the designs and under the supervision of Messrs. Ravenscroft, Son, & Morris, architects, and will consist of a hall nearly 60 ft. long and 30 ft. in breadth, with entrance lobbies, platform, etc. At the back there will be a classroom 20 ft. by 13 ft., private room, kitchen, basement, etc. The roof will be supported on stout timber posts with stone bases, and the hall will be lighted by dormer windows, also in timber work. The cost will be 1,540l.

PUBLIC LIBRARY, LONG EATON.—The memorial stone of a new public library at Long Eaton was laid on the 3rd inst. by Sir Walter Foster, M.P. The building when completed will have a base of cream stone, and the walls will be in red brick work. The windows on either side of the entrance will be large and plain, and beneath the roof will be a deep frieze of coloured tiles. Messrs. Gorman & Roberts, the architects, their design being accepted in competition.

WAREHOUSE, NEWCASTLE-ON-TYNE.—Messrs. Bainbridge & Co. have just completed an addition to their establishment between Market-street and the Bigg Market, in the form of a three-storied warehouse, 90 ft. long by 36 ft. wide. It has been built by Mr. P. J. Henkle, contractor, to the plans of Mr. J. W. Taylor, architect, Newcastle.

MEMORIAL TO SIR HECTOR MACDONALD, DINGWALL, N.B.—A monument is about to be erected on Greenhill, Dingwall, in memory of the late Sir Hector Macdonald. The contractor is Mr. J. M. Macdonald, and the architect is Mr. J. S. Kay, Glasgow. The total cost of the structure will be over 2,000l.

DRILL HALL ENLARGEMENT, EASTLEIGH, HANTS.—The additions which have been made to the drill hall of the 1st Hants Royal Garrison Artillery Volunteers at Eastleigh were opened recently. The additions comprise new quarters for officers and men, and these have been carried

out to plans prepared and under the supervision of Messrs. Lemon & Blizard, architects, of Southampton, Salisbury, and Westminster, by Mr. J. Nichol, of Bitterne Park, Southampton, at an estimated cost of 1,500l.

COTTAGE HOSPITAL, CHERTSEY.—A new hospital has been erected at Chertsey from the plans of the late P. W. Bedford, architect. The building is of cream rough-cast, with red tile roof, with the exterior iron and wood work painted green. Owing to the sharp gradient a winding roadway has had to be made up to four beds, two for male patients and two for females, with an accident or operating ward, apartments for a matron-nurse, and one domestic servant. The building has been completed according to Mr. Bedford's designs, under the supervision of Mr. F. Radford Smith. All the wards are situated on the ground floor, and the principal ones, being at the back of the building, face south. Separating the two wards is the nurse's bedroom. Opposite the front entrance is a small room for the medical staff, which has been fitted with cupboards. Adjoining is the accident or operating ward. There are also a bathroom and a hand lift to the upper floor. Upstairs is the accommodation for the student nurse, the male ward is the matron-nurse's sitting-room, and the servant's bedroom is over the female ward. In the front is a kitchen. The work is being carried out by Mr. George Kyle, of Ripley and Cobham.

HOTEL, PORTPATRICK.—The new Portpatrick Hotel was opened recently. The plans for the building were prepared by Mr. J. K. Hunter, architect, of Ayr.

PRESBYTERIAN CHURCH, BELFAST.—The new Presbyterian church which has been erected on the Ravenhill-road at the corner of Ravenhill-avenue was opened recently. The church and site cost 6,000l., and accommodates 900 people. At the rear four doors provide access to the ground floor and gallery from two vestibules, between which are the vestry, session-room, and lavatories. The general building contract was executed by Messrs. Robert Gifford, Limited, from the plans and under the superintendence of the architect, Mr. Thomas Houston, Kingscourt.

SANITARY AND ENGINEERING NEWS.

SANITARY ADMINISTRATION IN WREXHAM DISTRICT.—We take the following extract from Dr. Datta Mair's report to the Local Government Board on sanitary administration in the Wrexham Rural District:—It speaks for itself:—"No attempt whatever is made by the Rural District Council to empty either ashpits or midden privies even in the most populous parts of the district; occupiers of houses are held entirely responsible for the removal of the contents of ashpits or midden privies. In some parts of the district farmers are employed by the occupiers to cart away the contents of these receptacles, for which service they are paid by the occupiers themselves; in other parts of the district occupiers hire small strips of land to which they periodically remove the contents of their middens, and on which they grow potatoes; in other parts again the midden and ashpit contents are deposited on the nearest field, and even, in some cases, on the streets in the immediate vicinity of the houses. The only assistance given by the Rural District Council in the matter has been to obtain permission through their officers for this material to be tipped upon or down two or three 'spoil-banks' in the neighbourhood of collieries. The result of this neglect of duty on the part of the Rural District Council is lamentable, and, indeed, it almost baffles description. The burden cast upon occupiers in this way is, in the first instance, a heavy one, and, as farmers will not cart the material except when it suits their own convenience or the necessities of their land, these receptacles have often to remain full, and this generally at those times of the year when it is most needed that they should be emptied frequently. I noted several 'spoil-banks' and fields upon which this material had been cast which were quite close to dwelling-houses; and, worse still, I saw in several roads and streets of what are really densely-populated towns many heaps of refuse which had been either recently deposited there, or which had been there so long that they have become hardened into permanent mounds and hillocks by the ordinary traffic of the place."

RAILWAY BRIDGE, GATESHEAD.—A new bridge is being erected by the North-Eastern Railway Company across the foot of High-street, Gateshead. The piers of the new structure are built clear of the footways, and steel girders spring from them, with a span of 67 ft., rising 26 ft. from the springers. The bridge has five steel girders placed on the stone abutments. The stone has been brought from the new Cove quarries, in Scotland, and the girders have been made at Messrs. Shewell & Co.'s bridge works, Darlington.

Mr. Chas. A. Harrison is the engineer, and Mr. Gustavus Bailey, of Newcastle, the contractor for the work.

THE FRASER RIVER BRIDGE, BRITISH COLUMBIA.—The new bridge carrying railway, tramway, and highway traffic across the Fraser River at New Westminster, B.C., comprises a steel superstructure 2,400 ft. long, in which one of the shore spans is of unprecedented character. Owing to local conditions it was necessary that two railway tracks about 400 ft. apart should converge at a point 400 ft. from the shore, while the roadway had to be carried in a straight line. This complicated arrangement was met by the construction of a triangular span, 228 ft. long by 135 ft. wide at the base of the triangle, with curved side girders connected by transverse and diagonal bracing. The triangular span is supported by three masonry piers, and between it and the shore are three separate spans, one for each of the railways, and one for the highway. Special methods of assembling and erecting the triangular span were necessary, and a gratifying point is that the whole of the steel work was executed by a well-known firm of Canadian bridge builders.

ENGINEERING, ETC., WORK, NEWCASTLE-ON-TYNE.—The report of Mr. Fred J. Edge, City Engineer and Surveyor of Newcastle, has just been issued. It covers the period from March 25, 1904, to March 31, 1905, and deals with the work done and the expenditure by his department for the two committees, together with the Walker, Benwell, and Fenham extensions from November 9, 1904, to March 31, 1905. The estimated amount required for sewerage was 4,665l., including 700l. for supplementary estimates for Walker and Benwell. The actual amount expended was 4,407l. In connexion with this item, the engineer says:—"The whole question of the sewers of Newcastle requires thorough consideration; the survey of them should be systematically continued, so as to make the best use of the existing trunk sewers and without any unnecessary expenditure of what sewers should be reconstructed on account of the laying out of additional building sites. The sewer from Heaton through Walker will require early consideration, as well as the interception of the flood water from the moor. A sewerage system being made with a better system of sewal disposal by means of large tanks instead of with housepits, and the sewerage carefully systematising, so as to get the best effect on the sewers with the least expenditure of water and of time." The total length of all sizes of existing sewers, so far as they are known, within the city boundaries, including those for surface drainage, is now 19,442l. miles. The length added during the year, including the sewer in Walker and Benwell, was about 62 miles. Tables give details respecting the streets laid with tar macadam, paving, flagging, etc. The cost charged to the rates for repairs and renewals was 15,800l., and the amount expended on new streets, for which council orders had been made upon the property owners, was 19,442l., making the total spent during the year on street works 34,748l., exclusive of capital expenditure. There are in the city 59 miles of ordinary macadam roads, 7½ miles of tar macadam roads and front streets, 6 miles of tar macadam back streets, 99 miles of gravel roads, 7½ miles of gravel and 7½ miles laid with wood, 2½ miles of gravel and 3½ miles of paved back streets. The total length of streets completed is approximately 226 miles. The engineer remarks in regard to uncompleted streets that all kerbs, footpaths, and road foundations should be completed before houses are occupied. The sanitary estimates amounted to 62,203l., to which was added supplementary estimates, making the total amount 67,816l. The total expenditure was 67,968l., including 932l. for snow cleansing. The length of streets scavenged by orderlies was increased from 12½ miles to 14½ miles, the extension of this system of cleansing having proved to be advantageous. In addition 36½ miles are cleaned once per day, 10½ miles three times per week, and 66½ miles twice per week, making a total length of 655 miles of street cleansing during the week, exclusive of those streets cleaned continuously, compared with 569 miles during the previous year. The channels of about 7½ miles of streets paved with wood are watered continuously in dry weather, and about 3½ miles of paved streets and macadamised roads are watered two or three times per day or often as the occasion requires. The adoption of pillar hydrants has facilitated the watering of streets. Receptacles for storing small gravel for spreading over the roadways when slippery have been placed in suitable places in all streets paved with gravel. The total quantity of refuse collected during the year was 136,514 tons. The report sets out the various modes of disposing of the refuse, and continues:—"The construction of a destructor at Benwell should be followed by the improvement of the destructor at Byker, the removal of the Walker destructor to near Bill Point, and the construction of two more destructors, one in the City-road, opposite the Manors Power Station, and one at Mitford-street. These would effectually serve the

A FLOORING MATERIAL.—The Torgament Asbestos Flooring Company have sent us a sample of their "Torgament" flooring. The material is said to be a combination of asbestos, wood and mineral matter, and appears to have been extensively used in Germany, where, according to the descriptive circular, it "has gained the greatest propagation." It is laid *in situ* (on

concrete, tiles, or other flooring), and forms a jointless flooring, which can be easily polished. The sample sent to us has a colour resembling mahogany, but other colours can be supplied. The material appears to be durable, and to possess most of the advantages of terrazzo without some of its disadvantages. For hospitals it is particularly suitable, but it is also well adapted for the floors of kitchens, bathrooms, etc. Best's Jonzense Process,—"Best's" improved sanitary jointless flooring," a sample of which has been sent to us, is now being made in this country, although it is of German origin. The material is laid *in situ* in various colours, takes a good polish, and will not burn. It appears to be durable, and when polished the surface is impervious. Although not as soft as cork carpet, it could be used for many purposes in preference to that material, the absence of joints being a decided advantage.

"ANDURU" ROOFING.—Messrs. Hickie, Borman, & Woods have sent us samples of the N. & S. "Anduru" roofing. The material appears to consist of three or more layers of paper impregnated with bitumen or some other black waterproof material, and is inodorous, waterproof, and pliable, but burns freely. It is used for roofs, damp-courses, and other purposes, and is made in Austria. The little pamphlet sent to us appears to have the same origin, and describes the material in language we cannot hope to surpass. "Anduru," it is said, "does not absorb humidity or water, even if lying in hot steam; . . . wood walls lined with Anduru . . . keep the house warm in winter time and prevent winds to pass through; . . . if it is injured by any fortuitous event or accident, it is easily repaired and without big expenses."

NEW SHOWROOMS OF THE LEEDS FIRECLAY COMPANY.—About a fortnight ago the seven associated firms trading under the name of the Leeds Fireclay Company opened their new London showrooms at 2 to 3, Norfolk-street, Strand. Among the objects of the ground-floor are the large wall panels of the well-known Brumantoffs faience; other specimens of this firm's goods are faience mantelpieces, red and buff terra-cotta, and a dull-glazed "vitreous" terra-cotta in various colours. A specimen of the blood-hued constructional faience now being used for the stations of the underground electric railway from King's Cross to Brompton is also exhibited. Salt-glazed and enamelled bricks made by the different associated firms are shown in considerable variety, and we are glad to note that a successful attempt has been made to produce a glazed brick of more pleasing texture and colour than those ordinarily sold under the name; the bricks are hand-made (6 in. by 2 in., 6 in. by 3 in., and 9 in. by 3 in.), and the glaze is applied in such a manner as not to obscure the texture of the bricks; various colours are used, but the best is a green resembling the colour of the household pottery so common in Brittany. Among special glazed bricks we may mention the "Sheepwood" and the "Hessell-Tiltman," the former being perforated so that a thorough key can be obtained by grouting, and the latter having deep V-shaped corrugations on the beds and joints; the bricks are about 2 in. on the bed, and special curved bricks are made for internal angles. The sanitary exhibits are of great interest. All the baths and lavatories are of porcelain-enamelled fireclay, and special attention has been paid to the metal fittings, the wastes and overflows being a most complete and excellent type. One of the baths is of a new shape, with a greater width than usual near the head. Oval-topped lavatories in a single massive piece of enamelled fireclay are shown, and others with dished tops of marble and Mexican onyx. In the basement water-closets and urinals are conspicuous, and as water is laid on to the cisterns, the fittings can be seen in operation. The "Taper" urinals made by Messrs. Oates & Green are worthy of special notice; they are of the stall type in enamelled and salt-glazed ware with deep channels, and the shape of the back ensures a thorough cleansing at each flush. Among the other exhibits are wash-tubs, mangers, cattle-troughs, sinks for houses, hospitals, and chemical laboratories, and three or four frigates with objectionable canopies of iron and tiles.

THE ENGINEERING STANDARDS COMMITTEE.—Sir John Wolfe Barry, K.C.B., F.R.S., has been unanimously elected to succeed the late Mr. James Mansergh, F.R.S., Past President of the Institution of Civil Engineers, as Chairman of the Engineering Standards Committee, which post Mr. Mansergh had occupied since the formation of the Committee in 1901.

THE QUANTITY SURVEYORS' ASSOCIATION.—The election of officers of the Association for the current year took place on Tuesday, June 20th, with the result that Mr. Walter Lawrence, F.S.I., was re-elected President, and Mr. A. J. Gate, F.S.I., Vice-President; Mr. H. Curtis-Card, F.S.I., of Lewes, was elected Provincial Vice-President; and Mr. F. B. Hollis, 17, Bedford-row, London, W.C., was re-elected Honorary Secretary and Treasurer.

STATUTE TO SIR THOMAS BROWNE, NORWICH.—The statue of Sir Thomas Browne, the famous XVIIth century physician, is now well advanced

in the hands of the sculptor, Mr. Henry Pegram, A.R.A. It is to be erected on a site in the Haymarket, Norwich, in which Sir Thomas Browne spent the greater part of his life.

ORGAN, SPONDON, DERBYSHIRE.—A new organ has been placed in the Parish Church at Spondon. It has been erected by Mr. J. Binns, of Bramley, Leeds. It stands 23 ft. high, and its pipes are silvered. The instrument is enclosed in a Walnut oak case, designed by Mr. J. Oldrid Scott, and made by the organ builder. It is made on the tubular pneumatic principle, and the cost is nearly 1,100*l*.

CAPITAL AND LABOUR.

EMPLOYMENT IN THE BUILDING TRADES.—The returns received from sixty-seven employers' associations show that employment was dull generally, and on the whole much the same as a month ago. It was worse than a year ago. Employment with carpenters continued dull, and was worse than a year ago. The percentage of unemployed Trade Union carpenters and joiners was 8.8 at the end of May, as compared with 7.5 in April and 5.9 a year ago. With plumbers employment showed little change on the whole compared with a month ago, but in Scotland it was rather better. The percentage of unemployed plumbers was 10.6 at the end of May, as compared with 11.2 at the end of April and 9.5 in May, 1904. With bricklayers and masons employment generally was dull. With plasterers it was bad in England and quiet in Scotland. With slaters and tilers employment was bad in England and fair in Scotland. With painters it was good and generally better than a month ago. With builders' labourers it was dull.—*Labour Gazette*.

DUBLIN BUILDING TRADE DISPUTE.—There is now a prospect of an early settlement of the dispute between the Master Builders and the Bricklayers. About a week ago the latter, after an interview with the Committee of the Bricklayers' Society, entered into negotiations with the Master Builders, with the result that both sides agreed to the terms of the arbitration. The matter will now be submitted to Alderman Cotton, and a settlement may be expected to be arrived at in a few days.—*Irish Times*.

Legal.

HERNE BAY DRAINAGE DISPUTE.

The hearing of the case of *Graham v. Ranuz* concluded in the Court of Appeal, composed of the Master of the Rolls and Lords Justices Romer and Mathew, on the 22nd inst., on the application of the defendant for judgment or new trial on appeal from verdict and judgment at trial before Mr. Justice Phillimore and a common jury in the King's Bench Division. (The case was reported in the *Builder* of November 1, 1904.) The facts of the case were as follows:—The defendant, the owner of a building estate at Herne Bay, in October, 1898, sold by auction to Messrs. Nott, Cartwright, & Etches some lots of land on the estate. On the front page of the catalogue were the words "roads made, drained, and kerbed," and the catalogue contained the conditions of sale, No. 6 of the conditions of sale provided that 30s. per plot should be paid by each purchaser for the connexion of the drains with the sewers when the roads were made and the sewers laid. The conveyance, which was dated October 1, 1899, contained no stipulations as to drainage, but it recited the agreement of sale. The roads were not included in the conveyance. The purchasers in the following December assigned their interest to the plaintiff. The plaintiff's case was that by the terms of the conditions of sale there was an agreement by the defendant to lay sewers for the proper drainage of the lots. Pipes for sewers had been laid, but no outfall had been provided owing to differences between the defendant and the Urban District Council. The plaintiff alleged that he was entitled to recover damages for the loss he had sustained by reason of his being unable to drain houses erected, and to be erected, on the plots, and to get the plans passed by the local authority. Mr. Justice Phillimore held, on the construction of the documents, that there was a warranty that there should be sewers, but left it to the jury to say whether they found it as a fact. The parties also agreed that the jury should be asked to assess the damages (if any) on the assumption that the sewers should be completed at once. The jury found that there was a warranty in fact, and assessed the damages at 500*l*, and judgment was entered accordingly. Hence the present appeal. Mr. H. F. Dickens, K.C., and Mr. C. Herbert Smith appeared for the appellant, and Mr. Hobbler and Mr. G. W. Ricketts for the respondent on the appeal.

At the conclusion of the arguments of counsel, the Master of the Rolls, in giving judgment, after stating the facts, said that the conveyance was absolutely silent as to any such contract as was suggested. All the conveyance did was to con-

firm the fact that the plots were part of a building estate, and it contained no covenant by the vendor that there should be a system of sewerage to the satisfaction of the local authority. The conditions of sale did not contain anything approximating to such a contract as was suggested by the plaintiff. It seemed to him that on all the grounds put forward the plaintiff's case failed, and that there was no evidence to go to the jury of any such obligation as that set out in the ass. He thought, therefore, that Mr. Justice Phillimore was wrong in allowing the question to go to the jury and in holding that there was a cause of action. For these reasons he thought that the appeal must be allowed and judgment entered for the defendant.

Lord Justices Romer and Mathew concurred, and the appeal was accordingly allowed, and the plaintiff's action dismissed with costs.

L.C.C. v. ALLEN & NORRIS.

At the West London Police Court on the 15th inst., Mr. Lane, K.C., gave a decision on a summons taken out by the London County Council against Messrs. Allen & Norris, of Fulham. Mr. Chilvers prosecuted for the Council, and Mr. Bianco White represented the defendants.

It appeared that in 1901 the Council gave their sanction to the firms developing an estate in Fulham Palace-road, known as the Bishopric Estate, on certain conditions, one of which was that posts and rails should be used to define the various streets on the estate before any building operations could be entered upon. Over a year later the Council were advised by the District Surveyor, Mr. P. W. Hamilton, that the defendants were using pegs, not posts, and that on his pointing out the matter to the firm, the latter protested that the condition was unnecessary and onerous. The Council took no action then beyond writing to the defendants and drawing attention to the breach of the conditions, and it was not until the beginning of the present year, by which time a large number of streets had been covered with houses, that legal proceedings were commenced.

Mr. Bianco White, for the defendants, urged that the practice of using pegs for the defining of streets was the most common in London, and called expert witnesses to confirm his statement; and, on the legal aspect, he contended that the County Council had allowed that particular condition to lapse, since the Council itself had taken no action in the matter when the supposed breach was first brought to their notice, and their officer, the District Surveyor, had passed their use of pegs.

On the latter point a legal argument arose, Mr. White arguing that the Council were bound by the action of its executive officers, while Mr. Chilvers submitted that no regulations or conditions embodied in an instrument which bore the seal of the Council could be overridden or deviated from by the mere permission of an officer of the Council.

The magistrate, in giving his decision, said the case was an important one, and without doubt the expert testimony was distinctly adverse to the Council. It was clear that the condition as to posts and rails had been violated, and it was equally clear that there was no express or implied permission to the defendants to ignore the conditions because, though the Council for some reason took no action immediately on hearing of the breach, it was in no way on the part of a public body to enforce its regulations did not imply a permission to any body to ignore them. As regards the District Surveyor, whose conduct throughout the whole affair was perfectly correct, he was satisfied that there was nothing in the terms of his appointment as surveyor to warrant his giving permission for any deviation from conditions imposed under the Council's seal. As a matter of fact, the surveyor gave no such permission, but reported the breach to the Council. It was clear, continued his worship, that the practice of using pegs instead of posts was a universal one, and therefore he should only impose on the defendants a nominal penalty, but the Council had a perfect right to enforce any conditions they chose to make, and in future cases he should be obliged to inflict heavier penalties. He imposed a fine of 10*l*s. and left each side to pay its own costs.—*Morning Advertiser*.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

14,801 of 1904.—J. GORNSTEIN and W. WALDRON: Ladders.

This invention relates to ladders, more particularly to double and triple extension ladders. The object of the invention is to construct such a ladder in such a manner as to be more readily raised, lowered, or manipulated, while being through its length entirely free from obstruction across the tread of the ladder. At the same time the extension fittings are applied in such a

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

manner as to avoid any reduction in the strength of the ladder. In constructing the extension below the first and second sections are preferably of equal width, and are arranged to slide lengthwise upon suitable runners let into the sides of the ladder. The third section (where such is employed) is preferably somewhat narrower, and is also arranged to slide lengthwise upon runners in a similar manner. Each sliding section is arranged to slide within a pair of projecting guides provided on the top of the section beneath, these guides being hooked over the sides of the sliding section and being each provided with an internal runner or roller. Each section is locked in the position required by means of a pair of automatic catches at its lower end, engaging with the rungs of the section beneath. The raising and lowering of the ladder may be effected either by hand or by means of a double rope and pulley device provided at the sides of the lower section.

15,233 of 1904.—I. F. TAYLOR: Apparatus for Raising or Lowering Goods to or from the Upper Floors of Buildings.

Apparatus for raising or lowering goods to or from the upper floors of buildings, comprising a frame adapted to rest on a sill or other fixture, and provided with legs arranged to bear against the inner side of the sill, a winch or hoist drum mounted in the inner end of the frame, a jib fulcrumed in the outer end of the frame in a manner that its lower end bears against the outside of the window sill and grips the sill under the tension of the load, means for raising and lowering the jib, and means for readily mounting the crane post in windows or doorways of upper floors in such a manner that after the load is raised the crane post can be turned in its support to towing the load towards the window or other opening in which the apparatus is placed.

15,313 of 1904.—A. STUDDHOLME: Construction of a Fire-grate.

The object of this invention is to construct a fire-grate so that it can be completely enclosed and moved from one room to another without fear of the ashes or debris being spilt on the floor, or noxious fumes or smoke filling the room or passages through which the stove is carried. According to the invention a frame is made of metal, and such frame is provided with grooves into which sheaths or plates can be slid to completely enclose the frame which forms the fire-basket; or doors may be so hinged to the back or other part of the frame that such doors can be folded round and over the frame to completely enclose the same, the under part being provided with grooves into which a plate can be slid to close that portion up. The frame may be made of iron or other suitable metal in various shapes and sizes to be placed inside any existing grate. The back and sides may be solid or left open to admit fire bricks, bars being at the front and bottom. Handles are provided for carrying purposes. Grooves are formed or attached on the top, underneath and at the front of the frame, so that when the grate is to be moved slides are slid along these grooves, the grate being then practically a closed box. The front slide is made to overlap the top and bottom ones, and rests on extension of bottom grooves, by which their falling out is prevented.

16,072 of 1904.—P. J. ROOTS and H. KERSLAKE: Frames of Chairs, Tables, Settees, or Like Articles of Furniture.

This invention relates to the frames of chairs, tables, settees, or like articles of furniture, and refers more particularly to means for bracing the frames of such articles of furniture at the junction of the seat framing and the legs or back framing. According to this invention the back rail of a chair seat, say, for example, is connected to each of the side rails of the seat by metal bracing stays carried in a diagonal direction across the angles between the back and side members described. These stays are preferably carried through the said members, and are constructed so that their length may be forcibly reduced in order to force the tenons on both the back and side rails into the mortises in the side members of the back framing, and securely hold them in position. If the latter should at any subsequent time become loose in wear, they may with this arrangement be again secured by further reducing the length of the bracing stays. The stays may be made in the form of bolts with a head at one end and a nut at the other, both of which are embedded in recesses formed in the outer sides of the members of the seat frame.

16,128 of 1904.—B. K. WEBBER: Casements.

This relates to a casement adapted to open inwards, in which, upon the top of the sill of the casement, a horizontal axis, a plate or bar of a length corresponding to the width of the casement, the plate or bar when turned inwardly about its hinges or pivots being adapted to lie flat upon the sill, but when turned upwardly and outwardly about the hinges or pivots to enter the groove in the underside of the bottom rail of the casement, a bead or rebate upon the

sill of the frame being then overlapped by the lower edge of the plate or bar, the upper edge of which then fits closely against the inside of the exterior wall of the groove in the bottom rail of the casement.

16,582 of 1904.—J. B. LE MAITRE: Sashes and Framings of Windows.

This invention relates to the construction of window sashes and framings, and also in the sashes. These windows, sashes, and framings are especially adapted for use on vehicles such as electric trams, railway carriages, and other like purposes, as well as for general usage. The drawn sashes are constructed from hollow drawn metal, preferably in aluminium or brass or steel; one strip or side of this hollow section to be readily removed and replaced, in some cases without removal of the sash from its frame. The channel in this sash section is lined with india-rubber, gutta-percha, or other suitable held by screwing up the strip to any required pressure. One side or end of the sash may be of greater depth to permit adjustment by adjusting screws passing through a T-shaped section, whose perpendicular fits into a slot at the exterior of the sash frame, lips being provided at intervals by which the T-strip is clamped to the sash frame. The glass may be removable in some cases from this particular side of the sash by removing the T-strip. The framing or guides in which the sash runs is constructed of a channel of sheet metal drawn or rolled in one or two parts, preferably in two, and also lined with rubber, gutta-percha, fibre, or other more or less resilient material, and in this lined metal channel the sash runs.

20,304 of 1904.—HARRIS & SHELDON, LTD., and J. PINFOLD: Adjustable Clamping Attachment or Fittings for use in Connection with Standards, Rods, Bars, and the like, Principally for Displaying Goods.

An adjustable clamping attachment for use in connection with standards, tubular bars, and the like, consisting of an internally wormed sleeve adapted to socket and slide upon the end of a standard or the like, an outside screwed nut or block located inside the sleeve and bearing upon the standard, and a stalk or stem which rotates with, but is slidable through, the said nut and is connected at its outer end to a bearing or abutment plate, the said stem and nut being collectively rotatable either by the bearing plate itself or by a separate cap or collar for the purpose of raising and lowering the sleeve, and so adjusting the distance between the bearing plate and standard.

25,330 of 1904.—H. HAWOOD: Fanlight Operator.

The quadrant or arm which pushes open and closes the fanlight is fixed at one end to the sash, and in working passes through a lock fixed to the frame or vice versa. The key is fixed on the end of a bamboo or other light pole the length required to reach the lock. The key-hole enters at the bottom of a cup fixed upside-down under the lock, which is situated at the end of the key; the key is square, and is similar to a railway carriage door-key, and passes entirely through a cog-wheel or quadrant, and lifts a spring ward or bar, which releases the cog-wheel or the quadrant from a fixed position. The key is turned to open or close the fanlight, and the act of withdrawing the key locks the quadrant in the position required.

29,459 of 1904.—A. V. BUCKER: Device for Fastening Boarded or Inlaid Floors, and the like.

A device for fastening and tightening boarded or inlaid floors, pavings, and the like, upon iron girders, characterised in that the boards are provided upon their under sides with clips, whilst the tightening of the boards and a horizontal plane is effected by a tightening device acting upon the edges of the flooring, a coiled spring being arranged between an abutment arranged in the wall and a plate arranged in advance to it, which coiled spring may be compressed more or less by the screw bolt engaged in the flange of the abutment, whilst the said plate transmits the pressure of the spring to the adjacent flooring.

1,318 of 1905.—G. G. FARNALL: Display Fittings for Shops and Windows.

An telescopic upright for supporting arms, brackets, and the like for displaying goods, consisting in the combination of a lower part adapted to bear against the floor and an upper part carrying a spiral spring adapted to bear against a ceiling, said upper part being adapted to telescopically slide in said lower part, and provided with an interchangeable or telescopic part adapted to be inserted in one or other of holes drilled at intervals in said upper part, to adjust the telescopic upright formed from said lower and upper part to the height desired.

2,377 of 1905.—W. WALL: Door Fastenings.

This invention relates to door fastenings, the object of which is to provide a ready and

inexpensive means of preventing the spindle of the handle of the door from being rotated, thereby securing the door. For this purpose, in combination with an ordinary latch bolt with rotating handles, a sliding bar or bolt is used, provided with suitable guides, through which a hole or slot is made, one end of which corresponds in width with the spindle of the handle of the door, the other end being wider to allow the spindle to turn freely. The spindle passes through the hole or slot, and when the bar or bolt is pushed home the sides of the narrow end of the hole or slot prevent the spindle being turned, thereby securing the door.

3,316 of 1905.—E. S. BEAVEN: Brick or Block for Use in Building Perforated Arches with Downward Extending Spaces.

This invention consists of a brick or block moulded or otherwise manufactured in such a manner as that when built with others of the same shape and size they together form an arch or bridge of one brick or block in thickness, with spaces or channels in such arch or bridge in an upward and downward direction, which spaces or channels are of larger dimensions both in length and width at the under than at the upper surface of the arch or bridge, and are of uniform and rectangular dimensions at such upper surface, and are rectangular with rounded corners and uniform in size and such under surfaces, and which spaces or channels have smooth sides and afford as much as possible total area space in proportion to the total area of the surface of the arch or bridge in which they occur as is consistent with the stability of such arch or bridge. One method in which such bricks or blocks are intended to be used is as follows:—In connection with furnaces of malt and other kilns, a method has previously been invented of purifying the furnace gases by passing the same in contact with filtering material. Such filtering material may be in the form of blocks of lime or other equivalent substances, and is conveniently supported above the fire upon a grating or perforated arch or bridge, through spaces or channels in which arch the furnace gases pass. It is desirable that such spaces or channels should be of such a shape as to give easy clearance downwards to such blocks of the filtering material supported by the arch as may fall into and possibly lodge therein.

15,959 of 1904.—J. THORNTON and G. H. CROFTON: Weather-proof Spouts, Fall Pipes, and the like, for Draining and Ventilating.

The invention consists in using spouts, eucelbs, and fall pipes of earthenware, glazed or unglazed, so as thus to facilitate the flushing of water and sediment, and to require no painting or proofing against the effect of the sun.

5,146 of 1904.—S. DE MOLINS: Templates for use in the Construction of Arches, Vaults, and the like.

This invention relates to a flexible metallic template for use in the construction of arches, vaults, and the like, of brickwork, concrete, or other material, and the object of the invention is more particularly to facilitate the adjustment and support of the template during use, and its removal after use. The invention consists of a plate or plates of suitable bent sheet metal and adapted to be placed, whilst having its normal shape, between two girders, joists, abutments, or the like, in such a manner that shoulders or the like with which the template is provided can be brought into engagement with the said girders or the like by forcing apart the sides of the template.

SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

June 9.—By S. J. ALDRIDGE & Co. Forest Hill—Mayow-rd., "Crownbrook," n.t. 68 yrs., g.r. 14s. p.	5875
June 13.—By CAREWIGHT & ECHES. Pimlico.—72, Tachbrook-st., n.t. 26½ yrs., g.r. 8l., w.r. 94d. 18s.	460
June 14.—By BOTTON, SONS, & TREVEL. Edgware Road—No. 206 (s.), n.t. 54 yrs., g.r. 280l., y.r. 1,140s.	7,875
Wimbledon.—98, Kenilworth-av., n.t. 97 yrs., g.r. 8l. 8s., g.r. 60d.	530
By BLADESHAW, BROWN & Co. Plaistow.—21, Lido-rd., n.t. 7½ yrs., g.r. 4l., w.r. 28d. 16s.	160
By L. FARMER & SONS. Brondesbury.—19, Cavendish-rd., n.t. 68 yrs., g.r. 16l. 11s., s.r. 90d.	800
Camden Town.—104, Camden-st., n.t. 34 yrs., g.r. 6l., y.r. 50s.	350
Kilburn.—159, Canterbury-rd. (s.), and 226, Carlton-vale, n.t. 68 yrs., g.r. 7½ p.	710
By BOSCOY, RICHARDS, & Co. Stratford.—Cullum-st., f.g. rents 160l. 6s., re- version in 71 yrs.	3,360
Leytonstone.—Mornington-rd., f.g. rents 16l., reversion in 32 and 94 yrs.	580
Peckham.—Brayard-rd., f.g. rents 38l., n.t. 71 yrs., g.r. 3d.	605
By ROBSON & PEARIN. Stroud Green.—63, Oakfield-rd., n.t. 70 yrs., g.r. 8l., g.r. 70d.	800
27, Uplands-rd., n.t. 90½ yrs., g.r. 7l. 10s., e.r. 46d.	500

WYATT & SON (at Chichester).
Hunston, Kent. Sussex.—Three Enclosures.
13 a. 2 r. 24 p. f. 1,140
North Mundham, Sussex.—Pigeon House
Farm, 43 a. 0 r. 14 p. f. 140
Pagham, Sussex.—"Rumton Meadow," 13 a.
1 r. 34 p. f. 440
Four Meadows, a. 20 p. f. and 1. 290
Two Freehold Enclosures, 8 a. 3 r. 33 p. f.
"South Mundham Farm," 103 a. 2 r. 7 p. f.
and 1. 4,000
North Bersted, Sussex.—Freehold building
land, 20 a. 0 r. 13 p. f., also a cottage. 1,450
"Chalcraft Farm," 95 a. 2 r. 27 p. f. 2,400
"Chalcraft Farm," 87 a. 0 r. 31 p. f. 1,250
Eighteen freehold fields, 151 a. 2 r. 30 p. f. 4,400

By CROKES (at Sevenoaks).
Stansted, Kent.—"Wysses Farm," 75 a. 2 r.
14 p. f. 800
Igham, Kent.—Main rd., freehold building
land, 5 a. 380
Ash, Kent.—"Seaford Cottages" (two), and
9 a. 3 r. 0 p. f. p. 215
June 15.—By FAREBROTHER, ELLIS, & CO.
Essex, Surrey.—Sandown Park, "Wobey
Grange" and 2 a. 3 r. 21 p. f. 2,800
Lower Green, "St. Martin's," 1, y. r. 654. 1,000
An enclosure of land, 4 a. 3 r. 5 p. f. 800

By C. C. & T. MOORE.
Poplar.—40, East India Dock-rd., 18 yrs.
gr. 61, et. 454. 225

By STIMSON & SONS.
Blackfriars.—39, Blackfriars-rd., 1, y. r. 904.
John-st. West, a freehold warehouse, y. r.
1001. 1,750
Brixton.—2 and 21, Myatt-rd., 1, w. r. 654.
Brixton.—49 to 55, lower, 1, w. r. 654.
65 yrs. gr. 201, y. r. 1571. 654
Canterbury.—29, Caspian-st., 1, w. r. 361. 380
Peckham.—929, Meeting House-lane, (s. l.,
y. r. 361. 600
Dulwich.—112 to 120 (even), 125 to 141 (odd),
Landsell-rd., u. t. 74 yrs. gr. 874. 108.
w. r. 470. 8. 2,400

By J. A. & W. TILLEY.
Stratford.—18 and 20, Avenue-rd., u. t. 72 yrs.
gr. 34. 88. w. r. 571. 48. 200

By VIKEN & SON (at Ramsgate).
Ramsgate, Kent.—Lower Harbour-st., four
freehold building sites, 6,280 ft. (in
lots) 5,050
June 16.—By ALLAN BOOTH.
Caledonia Road.—5, 7, and 9, Goodline-rd.,
u. t. 561 yrs. gr. 108, w. r. 1482. 48.
7 and 8, Corporation-st., u. t. 561 yrs. gr. 144, w. r. 1082. 610
15, Cornhill-rd., u. t. 561 yrs. gr. 74, w. r. 494. 310

By GREEN & SON (Hammermith).
Killing.—4, Coldershaw-rd., u. t. 74 yrs. gr. 61, y. r. 284. 270
By MONAGHAN, RUPES & CLARKE.
Wallington, Surrey.—Stanley-pk-rd., freehold
building land, 31 acres 975
Carrington.—91, 92, and 93, Avenue-villas, u. t. 611 yrs. gr. 254. 48. w. r. 582. 48. 260
By WINDRUM & CLAYEY.
Mile End.—268 and 270, Devonshire-st., u. t. 144 yrs. gr. 74, y. r. 651. 185
Limehouse.—270, Burdett-rd., u. t. 561 yrs. gr. 74, y. r. 421. 495
Old Ford.—34 and 36, Ford-st., 1, w. r. 571. 48. 500
Poplar.—36, Ida-st. (s. l.), u. t. 201 yrs. gr. 61, y. r. 201. 130
44, 46, and 48, Tetley-st., u. t. 201 yrs. gr. 122. 128. w. r. 721. 168. 350
22, Sturt-st., u. t. 48 yrs. gr. 61, et. 481. 168. 260

Contractions used in these lists.—P. gr. for freehold ground-rent; L. gr. for leasehold ground-rent; r. for rent; f. for freehold; l. for leasehold; p. for possession; e. r. for estimated rental; w. r. for weekly rental; q. r. for quarterly rental; y. r. for yearly rental; u. t. for unexpired term; p. a. for per annum; y. s. for years; l. a. for lease; s. r. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gds. for gardens; y. d. for yard; gr. for grove; b. h. for beerhouse; p. h. for public-house; o. for office; s. for shops; ct. for court.

MEETINGS.

FRIDAY, JUNE 23.
Incorporated Association of Municipal and County Engineers.—Annual Meeting (continued).

SATURDAY, JUNE 24.
Edinburgh Architectural Association.—Visit to Falkland.

Incorporated Association of Municipal and County Engineers.—Annual Meeting (concluded).

Incorporated British Institute of Certified Carpenters.—Annual Dinner, Holborn Restaurant, 7 p.m.

Builders' Foremen's Association.—Annual dinner trip, to Henley-on-Thames. Train leaves Paddington 2.20 p.m.

WEDNESDAY, JUNE 22.
Builders' Foremen and Clerks of Works' Institution.—Half-yearly Meeting of the Directors. 8 p.m.

THURSDAY, JUNE 23.
Society of Antiquaries.—8.30 p.m.

Institution of Sanitary Engineers.—Visit to the Works of Messrs. Donlon & Co., at Lambeth. 2.30 p.m.

SATURDAY, JULY 1.
Edinburgh Architectural Association.—Visit to Inchcolm.

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All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

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PRICES CURRENT OF MATERIALS.

*Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily their best quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.	£ s. d.
Hard Stocks, 1000 per 1000 alongside, in river.	1 10 0
Rough Stocks and Grizzles	1 6 6
Facing Stocks	2 2 0
Shippers	2 2 0
Flintstones	1 7 0
Red Wire Cuts	14 10 0
Best Facehead Red	3 12 0
Best Red Pressed	5 0 0
Best Facing	5 0 0
Best Blue Pressed	4 2 6
Staffordshire	4 2 6
Do. Bullnose	4 7 6
Best Stourbridge	4 0 0
Fire Bricks	4 0 0
GLAZED BRICKS.	
Best White and Ivory Glazed	12 0 0
Stretchers	11 0 0
Headers	11 0 0
Quoins, Bullnose, and Flats	16 0 0
Double Stretchers	19 0 0
Double Headers	19 0 0
One Side and two Ends	15 0 0
Two Sides and one End	20 0 0
Splays, Chamfered, Squints	20 0 0
Best Dipped Slab	12 0 0
Glazed Stretchers, and Header	12 0 0
Quoins, Bullnose, and Flats	14 0 0
Double Stretchers	15 0 0
Double Headers	14 0 0
One Side and two Ends	15 0 0
Two Sides and one End	15 0 0
Splays, Chamfered, Squints	14 0 0
Second Quality White and Dipped Slab	2 0 0
Glazed	2 0 0
Thames and Pit Sand	7 0 per yard, delivered.
Thames Ballast	5 6
Best Portland Cement	27 0 per ton.
Best Ground Blue Lias Lime	20 0

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.
Grey Stone Lime.....12s. 0d. per yard delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly. dpt.

STONE.

BATE STONE—delivered on road wag- gons, Paddington Depot	1 64 per ft. cu. b.
Do. do. delivered on road waggon, Nine Elms Depot	1 84
Portland Stone (30 ft. average)— Brown Whitbed, delivered on road waggon, Paddington Depot	2 1
Elms depot, or Fimlico Wharf...	2 24
White Bashed, delivered on road waggon, Paddington Depot	2 24
Elms depot, or Fimlico Wharf...	2 24
Amcster in blocks	1 11 per ft. cu. b., deld. rly. dpt.
Beer	1 6
Greenhill	1 10
Darley Dale in blocks	2 4
Red Corshill	2 5
Cloaburn Red Freestone	2 4
Red Mansfield	2 4
York Stone—Robin Hood Quality.	
Scrapped random blocks 2 10	
6 in. sawn two sides	
landings to sizes	
(under 40 ft. super.)	2 3 per ft. super.
6 in. rubbed two sides	
ditto, ditto	2 6
8 in. sawn two sides	
slabs (random sizes)	0 11
2 in. to 24 in. sawn one	
side slabs (random	
sizes)	0 74
14 in. to 24 in. ditto, ditto	0 6

STONE (continued).

HARD YORK—	s. d.
Scrapped random blocks 3 0	per ft. cu. b., deld. rly. dpt.
8 in. sawn two sides	
landings to sizes	
(under 40 ft. super.)	2 8 per ft. super.
6 in. rubbed two sides	
ditto	3 0
8 in. sawn two sides	
(slabs random sizes)	1 2
8 in. self-faced random	
slabs	0 5
Hypton Wood (Hard Bed) in blocks 2 0	per ft. cu. b., deld. rly. dpt.
6 in. sawn both	
sides landings 2 7	per ft. super., deld. rly. dpt.
8 in. sawn both	
sides random	
slabs	1 0
2 in. do.	0 94

SLATES.

in. in.	£ s. d.
20 x 10 best blue Bangor	13 2 6 per 1000 of 1200 at r. d.
20 x 12 " " "	13 0 0
20 x 12 " " "	13 0 0
20 x 12 " " "	13 0 0
16 x 8 " " "	7 5 0
20 x 10 best blue Fide-	
madoc	12 13 6
16 x 8 " " "	6 12 6
20 x 10 best Eureka un-	
finishing green	15 17 6
20 x 12 " " "	18 7 6
20 x 10 " " "	18 5 0
16 x 8 " " "	10 5 0
20 x 10 permanent green	11 12 6
18 x 10 " " "	9 12 6
16 x 8 " " "	6 12 6

TILES.

Best plain red roofing tiles	£ s. d.
Hip and Valley tiles	3 7 per 1000 at rly. dpt.
Best Dressed tiles	50 0 per 1000
Do. Ornamental tiles	52 6
Hip and Valley tiles	4 0 per doz.
Best Bashed red, brown, or	
brindled do. (Edwards)	57 6 per 1000
Do. Ornamental do.	57 6
Hip tiles	4 0 per doz.
Valley tiles	3 0
Best Red or Mortified Stafford-	
shire do. (Peakes)	51 9 per 1000
Do. Ornamental do.	54 6
Hip tiles	4 1 per doz.
Valley tiles	3 8
Best "Wesleyan"	
plain tiles	45 0 per 1000
Best Ornamental tiles	50 0
Hip tiles	50 0 per doz.
Valley tiles	3 8
Best "Hartshill" brand	
plain tiles, sand faced	50 0 per 1000
Do. pressed	50 0
Do. Ornamental do.	50 0
Hip tiles	4 0 per doz.
Valley tiles	3 6

WOOD.

Deal: best 3in. by 11 in. and 4 in.	£ s. d.	At per standard.
by 9 in. and 11 in.	13 10 0	15 0 0
Deal: best 3 by 6 in.	13 0 0	14 0 0
Battens: best 24 by 6 and 3 by 6	10 0 0	12 0 0
Deal: seconds	1 0 0	10 0 0
Battens: seconds	0 10 0	10 0 0
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	10 0 0
2 in. by 4 in. and 2 in. by 6 in.	8 10 0	9 10 0
Foreign Sawm Boards—		
1 in. and 1 1/2 in. by 7 in.	0 10 0	more than battens.
3 in. by 11 in.	1 0 0	
at per load of 50 ft.		
Fir timber: best middling Dantz or		
Memel (average specification)	4 10 0	5 0 0
Seconds	4 0 0	4 10 0
Small timber (3 in. to 10 in.)	3 12 6	8 15 0
Swedish balks	2 10 0	3 0 0
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0

JOINERS' WOOD.

White Sea: first yellow deals,	At per standard.
3 in. by 11 in.	24 0 0
3 in. by 9 in.	23 0 0
Battens, 24 in. and 3 in. by 7 in.	16 10 0
Second yellow deals, 3 in. by	
3 in. by 9 in.	19 10 0
Battens, 24 in. and 3 in. by 7 in.	13 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0
Battens, 24 in. and 3 in. by 7 in.	11 0 0
Petersburg: first yellow deals,	
3 in. by 11 in.	21 0 0
Do. 3 in. by 9 in.	18 0 0
Battens, 24 in. and 3 in. by 7 in.	13 10 0
Second yellow deals, 3 in. by 11 in.	16 0 0
Do. 3 in. by 9 in.	14 10 0
Battens	12 10 0
Third yellow deals, 3 in. by	
11 in.	13 0 0
Do. 3 in. by 9 in.	12 10 0
Battens	10 0 0
White Sea and Petersburg:—	
First white deals, 3 in. by 11 in.	14 10 0
Do. 3 in. by 9 in.	13 10 0
Battens	11 0 0
Second white deals, 3 in. by 11 in.	13 10 0
Do. 3 in. by 9 in.	12 10 0
Battens	10 0 0

WOOD (continued).

JOINTERS' WOOD (continued).	At per standard.	£ s. d.	£ s. d.
Pitch-pine: deals.....	18 10 0	20 0 0	
Under 2 in. thick extra.....	0 10 0	1 0 0	
Yellow Pine—First, regular sizes	44 0 0	upwards.	
Odorous.....	32 0 0		
Seconds, regular sizes.....	38 0 0		
Yellow Pine oddments.....	28 0 0		
Kauri Pine—Planks, per ft. cube.....	0 8 6	0 5 0	
Debris and Sifted Oak Logs.....	0 3 0		
Large, per ft. cube.....	0 3 0	0 3 6	
Small, per ft. cube.....	0 2 6	0 2 9	
Wainscot Oak Logs, per ft. cube.....	0 5 0	0 5 6	
Dry Walnut, American, per ft. sup.....	0 8 0	0 9 0	
1 in. do. do.....	0 7 0		
Dry Mahogany—Honduras, Tl.....	0 0 9	0 1 0	
lacio, per ft. sup. as inch.....	0 0 9	0 1 0	
Selected, Figury, per ft. sup. as	0 1 8	0 2 6	
inch.....	0 1 0	0 1 0	
as inch.....	27 0 0	22 0 0	
Tak, per load.....	0 4 0	0 5 0	
American Whitewood Planks,			
per ft. cube.....	0 4 0	0 5 0	
Prepared Flooring, etc.....	Per square.		
1 in. by 7 in. yellow, planed and	0 13 6	0 17 6	
shot.....	0 14 0	0 18 0	
1 in. by 7 in. yellow, planed and	0 16 0	0 18 0	
matched.....	0 12 0	0 14 0	
1 in. by 7 in. white, planed and	0 12 0	0 14 0	
shot.....	0 12 6	0 15 0	
1 in. by 7 in. white, planed and	0 15 0	0 16 6	
matched.....	0 11 0	0 13 6	
1 in. by 7 in. do. do.....	0 14 0	0 18 0	
1 in. by 7 in. white do. do.....	0 10 0	0 11 6	
1 in. by 7 in. do. do.....	0 12 6	0 15 0	
6 in. at 6d. to 9d. per square less than 7 in.			

JOISTS, GIRDERS, &c.

In London, or delivered	£ s. d.	£ s. d.
Ball Steel Joists, ordinary	7 10 0	8 10 0
Compound.....	9 2 6	10 12 6
Compound Girders, ordinary	7 10 0	8 10 0
sections.....	7 15 0	8 5 0
Steel Compound Stanchions.....	6 12 6	7 15 0
Angles, Tees and Channels, ordi-		
nary sections.....	7 10 0	8 10 0
Fitch Plates.....	7 15 0	8 5 0
Cut Iron Columns and Stan-		
chions including ordinary pat-		
terns.....	6 12 6	7 15 0

METALS.

Per ton, in London.	£ s. d.	£ s. d.
Iron—		
Common Bars.....	7 10 0	8 0 0
Staffordshire Crown Bars, good	8 5 0	9 15 0
merchant quality.....	8 15 0	9 0 0
Staffordshire "Marked Bars,"	16 10 0	
Mild Steel Bars.....	8 15 0	9 0 0
Hoop Iron, basis price.....	16 10 0	
"Galvanized.....	16 10 0	
"(4 in. up, according to size and gauge.)		
Sheet Iron, Black—		
Ordinary sizes to 20 g.....	9 0 0	
"24 g.....	10 0 0	
"28 g.....	11 0 0	
Sheet Iron, Galvanized, flat, ordinary quality—		
Ordinary sizes—6 ft. by 2 ft. to	12 10 0	
3 ft. to 20 g.....	13 0 0	
Ordinary sizes to 22 g. and 24 g.	14 0 0	
26 g.....	15 0 0	
Sheet Iron, Galvanized, flat,		
light quality.....	15 10 0	
Ordinary sizes to 20 g.....	16 0 0	
"22 g. and 24 g.....	17 0 0	
"26 g.....	18 0 0	
Ordinary Corrugated Sheet.....	12 10 0	
Ordinary sizes 6 ft. to 8 ft. 20 g.....	13 0 0	
"22 g. and 24 g.....	13 15 0	
"26 g.....	14 0 0	
Best Soft Steel Sheets, 6 ft. by 2 ft.	11 0 0	
to 3 ft. by 20 g. and thicker.....	12 0 0	
Best Soft Steel Sheets, 22 g. & 24 g.....	13 0 0	
"26 g.....	14 0 0	
Cut nails, 9 in. to 6 in.....	9 0 0	9 10 0
(Under 3 in., usual trade extras.)		

LEAD, &c. Per ton, in London.

£ s. d.	£ s. d.
Lead—Sheet, English, 3 lb. and up	15 12 6
Pipe in coils.....	16 2 6
Sold pipe.....	18 12 6
Comp. pipe.....	16 12 6
Zinc—Sheet—	
Vienne Montagne.....ton	30 5 0
Silesian.....	30 0 0
Copper—	
Strong Sheet.....per lb.	0 0 10
Thin.....	0 0 11
Copper nails.....	0 0 10
Brass—	
Strong Sheet.....	0 0 24
Thin.....	0 0 10
Thin—English Ingots.....	0 1 45
Scrap—Plumbers.....	0 0 02
Turners.....	0 0 8
Blowpipe.....	0 0 9

ENGLISH SHEET GLASS IN CRATES.

£ s. d.	£ s. d.
15 oz. thirds.....	23d. per ft. delivered.
"fourths.....	24d.
21 oz. thirds.....	24d.
"fourths.....	24d.
25 oz. thirds.....	24d.
"fourths.....	24d.
32 oz. thirds.....	24d.
"fourths.....	24d.
Fluted Sheet, 15 oz.....	24d.
21 oz. thirds.....	24d.
Hardy's Rolled.....	24d.
".....	24d.
".....	24d.
".....	24d.

OILS, &c.

per gallon	£ s. d.
Raw Linseed Oil in pipes.....	0 1 6
" " in barrels.....	0 2 0
Boiled.....	0 2 0
" " in pipes.....	0 2 0
" " in barrels.....	0 2 0
Turpentine, in barrels.....	0 2 2
" " in drums.....	0 4 9
Genuine Ground English White Lead	per ton 19 15 0
Red Lead.....	19 15 0
Best Linseed Oil Putty.....	per cwt. 18 6 0
Stockholm Turp.....	per barrel 11 2 0

VARNISHES, &c.

Per gallon.	£ s. d.
Fine Pale Oak Varnish.....	0 8 0
Pale Copal Oil.....	0 10 0
Superfine Pale Elastic Oak.....	0 12 6
Fine Extra Hard Church Oak.....	0 10 0
Superfine Hard-drying Oak, for seats of	
Churches.....	0 14 0
Fine Elastic Carriage.....	0 12 6
Superfine Pale Elastic Carriage.....	0 16 0
Fine Pale Maple.....	0 16 0
Finest Pale Durable Copal.....	0 18 0
Extra Pale French Oil.....	0 18 0
Eggshell Flaking Varnish.....	1 1 0
White Copal Enamel.....	0 18 0
Extra Pale Paper.....	1 4 0
Best Japan Gold Size.....	0 12 0
Best Black Japan.....	0 10 0
Oak and Mahogany Stain.....	0 16 0
Brunswick Black.....	0 8 6
Berlin Black.....	0 16 0
Knottin.....	0 18 0
French and Brush Polish.....	0 10 0

PUBLISHER'S NOTICES.

Nat. Tel., 612, Gerrard. Telegrams, "The Builder, London."

THE INDEX (with TITLE-PAGE) for VOLUME LXXVII. (July to December, 1904) was given as a supplement to the issue for January 14 last.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each, also.

READING CASES, bound with Stripes, price 3d. each.

THE EIGHTY-SEVENTH VOLUME of "The Builder" (bound).

First-class Paper, 10s. 6d. per copy.

SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 8s. 6d. each.

CHARGES FOR ADVERTISEMENTS.

COMPETITIONS, CONTRACTS, ALL NOTICES ISSUED BY

PROSPECTORS OF PUBLIC COMPANIES, SALES BY

TENDER, LEGAL ANNOUNCEMENTS, &c., &c.

Six lines or under..... 6s. 0d.

Each additional line..... 1s. 0d.

Six lines (about fifty words) or under..... 4s. 6d.

Each additional line (about ten words)..... 1s. 0d.

Terms for special of Trade advertisements, and for front page, and other special positions, on application to the Publisher.

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PREPARATION IS ABSOLUTELY NECESSARY.

* Stamp must be sent, but all sums should be remitted by

Postal Orders, payable to J. MORRIS, and addressed to the

Publisher of "THE BUILDER," Catherine Street, W.C.

Advertisements for the current week's issue are received up to

THREE o'clock p.m. on THURSDAY, but "Classification" is

impossible in the case of any which may reach the Office after

HALF-PAST ONE p.m. on that day. Those intended for the

Guide Wrapper should be in by TWELVE NOON on WEDNES-

DAY.

ALTERATIONS IN SPENDING ADVERTISEMENTS OR

ORDERS TO DISCONTINUE, must be sent to the Office before

TEN o'clock on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTI-

MONIALS, &c., left at the Office in reply to advertisements, and

strongly recommends that of the latter COPIES ONLY should be

sent.

PERSONS advertising in "THE BUILDER" may have Replies

addressed to the Office, Catherine Street, Covent Garden, W.C., free of

charge. Letters will be sent, and envelopes are sent, together

with sufficient stamps to cover the postage. Unwanted

stamps are returned to advertisers the week after publication.

AN EDITION Printed on THIN PAPER, for FOREIGN AND

COLONIAL CIRCULATION, is issued every week.

READING CASES } NINEPENCE EACH.

{ (Post paid, carefully packed) 1.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursdays. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the builder, and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100s., unless in some exceptional cases and for special reasons.]

* Denotes accepted. † Denotes provisionally accepted.

ANNFIELD PLAIN (Durham).—For Democratic Club and surveyor, Prospect House, Lancaster. Quantities by architect:—

Messrs. Aytton & Sons..... £2,293 0 0

Excavator, Mason, Joiner, & Slater: E. E. Davi-

son, Mason, on-Type..... 1,593 0 0

Excavator, Mason, Joiner, & Slater: F. Ward..... 1,455 5 0

Collins..... 1,047 14 0

Plumber, etc.: W. Strachan..... 218 4 0

Plumber, etc.: L. Ure..... 283 16 2

Plumber, etc.: J. T. Bell, Annfield Plain..... 188 11 8

Plasterer: T. Cook..... 204 8 0

Plasterer: W. Muir, Consett..... 172 8 8

Painter: F. Pifford, Annfield Plain..... 21 5 6

Painter: J. Biddle..... 89 19 0

Joiner: * M. Aitken..... 599 0 0

† Whole tender.

ANSTRUTHER WESTER.—For paving main street with whitestone causeway sets, for the Town Council. Messrs. J. & T. W. Currie architects, Elie..... £550

BINGLEY.—For levelling, pitching, and metalling 945 yds. super. of roadway at Beck-lane, Micklethwaite, for the Urban District Council, Micklethwaite, Surveyor, Town Hall, Bingley:—
R. Wood, Bingley* (on schedule of prices).

BOTHWELL.—For building boundary wall and gate pillar at Holytown Cemetery, for the Parish Council. Mr. R. W. Dron, engineer, 55, West Regent-street, Glasgow:—
A. Duncan..... £177 1 0
McKenzie & J. J. Watson..... 155 16 6
J. Patterson..... 185 9 8
W. Miller..... 149 8 4
Aitkenhead & Son..... 147 16 0
Donaldson & Sons..... 141 5 8
C. Clarkson & Co..... 140 1 3
McKenzie & J. J. Watson..... 155 16 6
J. Patterson..... 185 9 8
W. Miller..... 149 8 4
Aitkenhead & Son..... 147 16 0
Donaldson & Sons..... 141 5 8
C. Clarkson & Co..... 140 1 3
McKenzie & J. J. Watson..... 155 16 6
J. Patterson..... 185 9 8
W. Miller..... 149 8 4
Aitkenhead & Son..... 147 16 0
Donaldson & Sons..... 141 5 8
C. Clarkson & Co..... 140 1 3

BOTHWELL.—For laying out roads, drains, &c., of new cemetery at Holytown, for the Parish Council. Mr. R. W. Dron, engineer, 55, West Regent-street, Glasgow:—
McKenzie & J. J. Watson..... £1,517 2 8
A. Stark & Sons..... 1,193 5 4
R. Liddigh..... 1,153 4 6
A. Duncan..... 1,151 16 8
J. Mitchell..... 1,088 10 13
J. Waddell..... 1,042 4 4
J. Gibson..... 1,007 0 7
R. Laprak..... 958 2 8
G. L. Brown..... 2943 2 8
J. Cross..... 863 10 2
W. Scott & C. Clarkson..... 833 14 4
A. Donald..... 88 4 0
R. Biddigh..... 97 1 1
R. Porter & Co., Bellshill*..... 80 4 9

BRIERLEY HILL (Staffs.).—For altering and improving the town hall, for the Urban District Council. Mr. J. Lewis Harper, Surveyor, Town Hall, Briery Hill:—
F. W. Male..... £1,500
Jakeman & Roud..... 1,430
Oakley & Coulson..... 1,327
C. A. H. Oxton & Co., Brierley Hill*..... £1,238
B. S. T. Bishop..... 1,268

CROMER.—For erecting fire-station, Canada-road, and storey buildings, Central-road, for the Urban District Council. Mr. A. F. Scott, surveyor, West-street, Cromer:—

	Fire-station.	Storeyard.
Carter & Wright.....	£ s. d.	£ s. d.
Aitkenhead & Co.....	947 0 6	1,636 0 10
Boddy & Son.....	975 0 0	1,771 10 0
Willmott & Sons.....	788 0 0	1,397 0 0
J. J. Hannant, Norwich.....	858 0 0	1,520 0 0
Sealed Bros.....	738 15 0	1,281 14 5
J. Youngs & Son.....	920 0 0	1,675 0 0
H. Bullen.....	800 0 0	1,437 11 11
T. H. Byth.....	809 0 0	1,390 0 0
Girling & Smith.....	867 16 0	1,690 0 0
G. A. Lines.....	918 5 0	1,385 10 0
W. Porter.....	856 15 0	1,449 7 9
	798 10 0	1,445 10 10

CROYDON.—For the erection of cottage homes on the workhouse premises, Croydon, for the Guardians. Mr. J. Hatchard Smith, architect, 41, Morgate Station-buildings, London, E.C.:—
G. E. Events, 78, Windmill-road, Croydon*..... £6,671

CROYDON.—For the erection of a detached house on Combs-road. Mr. Spencer W. Grant, architect, 68, Finsbury-pavement, E.C.:—
Baldwin Bros., £1,345 0
Truett & Steel, 1,324 0
A. B. Wiles..... 1,168 0
J. Long, Baris-eld*..... £1,098 10

EASTBOURNE.—For gas and electric light installation and hot-water heating apparatus, for the new Public Elementary Schools, East-street. Mr. F. G. Cooke, architect, 2, Hyde-gardens, Eastbourne:—
Donnison & Co., £471 10 0
Silbenn & Co., £471 10 0
Clements, Jeakes, & Co., 445 0 0
H. Hubbard..... 325 0 0
son, Ltd., Eastbourne and London*..... £322 7 6

EDMONTON.—For erecting an additional story on the infirmary wards at the workhouse, Upper Edmonton, for the Guardians. Mr. T. E. Knightley, architect, 106, Cannon-street, E.C.:—
J. Thomas..... £2,861
C. Wall, Ltd..... 2,650
Banyard & Son..... 2,650
A. Porter..... 2,618
Fairhead & Son..... 2,608
Sands & Burley..... 2,450
H. Knight & Son..... £2,621
A. Monk..... 2,480
L. F. Lamplough..... 2,471
L. & W. H. Patman..... 2,438
W. Lawrence & Son, Waltham Cross*..... 2,450

FLUSHING (Cornwall).—For constructing a covered service reservoir and for laying cast-iron main, for the East Kerrier Rural District Council. Mr. J. P. Jenkins, C.E., Town Hall, Penryn:—
W. E. Bonnet..... £460 10
W. Thomas..... 410 0
A. D. Warren, Trefusis-terrace, Flushing, near Falmouth*..... 349 0

GALMPTON.—For erecting a small house at Galmpton, Churston Ferrers. Mr. W. F. Toller, architect and surveyor, Tonnes:—
G. Arscott..... £270
G. Cookley..... 318
R. E. Warriscott..... 305
Hazelwood Bros., Brixham*..... £290

GLASBURY.—For a pair of houses, Glasbury. Mr. J. Gunter, F.S.I., Glasbury, South Wales:—
J. Jones..... £1,520
W. Evans..... 1,170
J. W. Morgan..... 930
W. P. Lewis & Co., 1,065
J. C. Evans..... 950
W. J. Herbert, 780
Plaster, F. Frome*..... 750
Less deductions value £30.

TENDERS.—Continued on page 695.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiama.	Designs to be Delivered
*Quantity Surveyor.....	Bromley Borough Council	Not stated	June 27

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered
Private Street Works, Foundry-road, Coedpenmaen	Pontypridd U.D.C.	P. B. A. Willoughby, Engineer, Council Offices, Pontypridd ...	June 28
Private Street Works, Phillip-street, Craig	do.	do.	do.
School Furniture	Salford Education Committee	Director of Education, Education Office, Chapel-street, Salford ..	do.
Fittings at City School of Art, Great Horton-road ..	Bradford Education Committee	City Architect, Brewery-street, Bradford ..	do.
Chapel at Trecony, Aberdeen	Modiffa Welsh Baptist Trustees	T. W. Millar, Architect and Surveyor, Mountain Ash	do.
Hall at Sir Roger Manwood's Grange, Sandwich ..	The Governors	C. L. Crowther, Architect, Queen-street, Deal	do.
Station at Troedyrhiw, Garth, Glam	G.W. Ry. Co.	Engineer, Newport Station	June 27
Refreshment Rooms, Lebbury Station	do.	Engineer, Gloucester Railway Station	do.
Engine House, etc., Chapelfield Mills, Rippenden ..	Ryburn Mill Co., Ltd.	R. Horsfall & Son, Architects, 22A, Commercial-street, Halifax ..	do.
Gis Engine	Warrington Sanitary Works Com.	J. J. A. Parritt, Cleansing Superintendent, Warrington	do.
Steel Work in Floors and Roofs of Station Buildings	South Indian Railway Co.	H. W. Notman, 65, Gracechurch-street, London	do.
Stables, etc., Anderton-street, Fort Glasgow	Walham Holy Cross U.D.C.	Stewart, Tongh, & Alexander, Archts., 2, Hamilton-st., Greenock ..	do.
Laundry Equipment	Lisburn Board of Guardians	W. Sinclair, Clerk, Poor Law Offices, Lisburn	do.
Brick Latrines, Greencroft School	Durham Education Department	Education Office, Durham	do.
72 Wrought-iron Sheep Pens and 27 Pig Pens	Dorchester Town Council	G. J. Hunt, Borough Engineer, 21, North-square, Dorchester ..	do.
Kerbing, Paving, and Channeling Floors of Pens ..	do.	do.	do.
*900 tons of 2-in. Broken Granite	Barnet U.D.C.	do.	do.
*400 tons of Gravel	do.	do.	do.
*200 tons of Hoggin	do.	do.	do.
Alterations, etc., to Kinnerley Castle	Edinburgh Corporation	Grooms & Bettington Architects, Palace-chambers, Hereford ...	June 28
Salisbury-place Widening	Madstone Guardians	Burch Engineer, Edinburgh	do.
External Painting of Workhouse and Schs., Corneath	Walham Holy Cross U.D.C.	R. Hunt, 9, King-street, Malden	do.
Annual Contracts	Devonport Corporation	F. C. E. Jessop, Clerks, Walham Abbey, Essex	do.
Painting Isolation Hospital, Bladbury	St. Germans R.D.C.	J. F. Burns, Borough Sur., Municipal Offices, Ker-street, Devonport ..	do.
Retaining Wall, etc.	East Indian Railway Co.	P. M. Cleverson, 4, Buckland-terrace, Plymouth	do.
Spring Steel and Steel Wire	Guardians	W. J. White, Architect, Elgin	do.
Cleaning and Painting, Woolwich Union Infirmary ..	do.	The Steward's Office, Union Infirmary, Plumstead	do.
Welsh Baptist Chapel at Ynysboeth	do.	Ivor Jones & T. E. Richards, Architects, 18, St. Mary-st., Cardiff ..	do.
Boiler-works, Warches, Ribbles Mills, Thornhill, Yorks.	do.	W. & D. Thornton, Gates-street, Dewsbury	do.
Convent, etc., Castleton Recreation Ground	Rochdale Corporation	R. H. Roberts, Architect, Manchester	do.
Bible Christian Chapel and Schoolroom, Ashreigney	do.	R. Alfred, Riddicombe, Ashreigney, Devon	do.
Baptist Chapel at Garrynerv, Blaenavon	Edinburgh Corporation	W. Thomas, Architect, 11, Queen-street, Nantyglo	do.
Bandstand and Shelter, Portobello Promenade	East Barnet Valley U.D.C.	Public Works Office, City-chambers, Edinburgh	June 29
Gravels, Gravel, Hoggin, etc.	Chatham Town Council	H. York, Surveyor to the Council, Station-road, New Barnet	do.
665 yds. of Wrought-iron Fencing, etc., at Fort Pitt	do.	C. Day, Borough Surveyor, Town Hall, Chatham	do.
Concrete Reservoir, etc., Ardgrey	do.	T. Whittier, Architect, Elgin	do.
Water and Sewage Pipes, Ardgrey	do.	W. J. White, Architect, Elgin	do.
Alterations to Farm Steading, Blackhall, Robins ..	do.	Seaford Estate Office, Elgin	do.
Additions to St. Wilfred's Sunday Sch., Lidget Green	Drogheda Guardians	T. Riley, Architect, 81, Beckside-road, Lidget Green	do.
Residence, etc., Medical Officer, Prioryland, Dulock ..	Trinity Presby. Church of Wales ..	T. Dowdall, Clerk, Workhouse, Drogheda	do.
Alterations, etc., Chapel and School, Aberlary	do.	H. B. Roberts, Architect, Aberystwyth	do.
Residence at Heaton	Burton-on-Trent Corporation	Empsall & Clark, Architects, 7, Exchange, Bradford	July 30
House, Alston Estate, Holbeaton, Plymouth	Somerset Education Committee	G. B. Perrott, Architect, Kingsbridge	do.
Permanent Way (Contract No. 9)	Worcester Corporation	Ernauld, Waller, Hanville, & Dawson, 29, St. George-st., S.W. ..	do.
Extension of Welton Council Schools, Midsummer Norton	Town Council	W. P. Bird, Architect, Midsummer Norton	do.
8,000 Jarrah Wood Blocks	Shipton B.D.C.	T. Calkin, City Engineer, Guildhall, Worcester	do.
Carnegie Library, Torquay	Chorlton & Manchester Worksh. Com.	F. S. Rex, Town Clerk, Town Hall, Torquay	do.
Sewerage District Work, Gillingham	do.	H. A. Johnson, Engineer, 15, The Exchange, Bradford	do.
Extension of Early Sewage Works	do.	do.	do.
50 Combined Tables and Benches, Tame-st., Ancoats	Cumberland Education Committee ..	J. Macdonald, Clerk to Committee	do.
Painting and Decorating, Holy Trinity Ch., Runcorn	Mr. C. McAndrew	T. H. Annett, Trinity School, Runcorn	do.
Additions and Alterations on the Barony, Cupar, Fife	Glasgow Corporation	D. Storrar, Architect, Cupar, Fife, Scotland	do.
Ventilation, etc., Renwick Council School	Faversham Corporation	J. Forster, The Courts, Carlisle	July 1
Twelve Tenement Houses, Ayr	Newburn U.D.C.	A. L. Mercer, Architect, 61, Alloway-street, Ayr	do.
Extensions, etc., to Public Conveniences, Gorbals' Cross	do.	Office of Public Works, 64, Ochreous-street, Glasgow	do.
Vicarage House, Wales, near Eiverton Park	Glasgow Corporation	G. B. Borcham, Quantity Surveyor, 24, John-street, Sunderland ..	do.
Wood Block Paving, West-street, Faversham	Faversham Corporation	S. P. Andrews, Borough Surveyor, 20, West-street, Faversham ..	do.
200 lineal yds. of 9-in. Sewers at Walbottle	Newburn U.D.C.	T. Gregory, Engineer to Council, Newburn-on-Tyne	do.
700 lineal yds. 9-in. 200 yds. 6-in. drain, Lemington	do.	do.	do.
Pennmachno Waterworks	Gleirnydd R.D.C.	Union Offices, Llanwrst	do.
Completion of Tower and Spire, Mountath Church	New Streets Committee	D. W. Morris, 63, Harcourt-street, Dublin	do.
Four Workmen's Dwellings, Bristol	Infishoven R.D.C.	T. H. Yabbloom, City Engineer, 63, Queen-square, Bristol	do.
Outfall Sewer, Buncrans Main Drainage	Tadcaster R.D.C.	J. G. Hayes, Engineer, Falmouth	do.
Water Main (1,200 lineal yds.) at Crossgates	Tenbury R.D.C.	E. J. Silcock, Engineer, 10, Park-row, Leeds	do.
Bridge Works at Park Bridge, Eastham, Tenbury ..	Pontypridd U.D.C.	R. W. Jarvis, Surveyor, Kyrside, Tenbury	do.
Stores and Materials	Essex Sew. Com., Havering, Levels ..	E. Jones, Gas Engineer, Gas Works, Treforest, near Pontypridd ..	July 3
Sub-station, Stirling-road, Glasgow	do.	W. W. Laidie, Engineer, 75, Waterloo-street, Glasgow	do.
Outfall Sluice, Horse Shoe Corner, Barking	Asbourne R.D.C.	A. Havelock Cass, Eng., Broad Sanctuary-chambers, Westminster ..	do.
Outfall Sluice and Culvert, Beam River, Hornchurch ..	Messrs. W. & J. Pattison	H. W. Taylor, Engineer, St. Nicholas-church, Newcastle-on-Tyne ..	do.
C. J. Spiro & Sons, Deptford, etc., Kirk Tregon, Wotton	West Riding C.C.	T. Winn & Sons, Architects, 92, Albion-street, Leeds	do.
Extension of Spinning Mills, Brompton, nr. Northallerton	Telgoum U.D.C.	F. G. Carpenter, County Surveyor, County Hall, Wakefield	do.
Steel Girder Footbridge over R. Calder, Luddendenfoot	Sunbury-on-Thames U.D.C.	C. F. Gekings, Surveyor, Town Hall, Telgoum	do.
Isolation Hospital, Mortuary, etc., Betton Estate ..	Brighton Corporation	H. P. Coles, Surveyor, Council Offices, Sunbury	do.
Granite and Flint	do.	H. Talbot, Town Hall, Brighton	do.
Coal Handling Equipment, Southwick Power Station	Ealing Town Council	C. Jones, Borough Surveyor, Town Hall, Ealing, W.	do.
200-Cell Storage Battery, Southwick Power Station	Southgate U.D.C.	C. G. Lawson, Surveyor, Council Offices, Palmer's Green, N.	do.
Stores	Seaford U.D.C.	W. H. Pawson, 3, Clinton-place, Seaford	do.
Cart, Van, etc., 60 Down	Tipton Education Committee	A. Long, Architect, 21, New-street, West Bromwich	do.
Alterations and Partitions Tipton Green School ..	Hornsey Town Council	Secretary for Education, 206, Stapleton Hall-road, N.	do.
*Painting, Cleaning, Repairs, etc., at Council Schools	Hendon U.D.C.	Council's Engineer, Council Offices, Hendon, N.W.	do.
*Roadmaking and Paving Works	East Ham Education Committee ..	Education Office, East Ham	do.
Cleaning and Whitewashing Latrines, etc., at Schools	Halifax Gasworks Committee	C. Jones, Borough Surveyor, Town Hall, Ealing, W.	July 4
Galloway Hall for Micham Workhouse	Maldon Corporation	J. Wilkinson, Engineer, Gasworks, Halifax	do.
Stores	Mr. G. F. Shanks	T. T. Swales, Borough Surveyor, Maldon, Essex	do.
Broken Granite and Flint	Wing R.D.C.	H. Hobart & Heron, Archts., 124, Scottish Provident-bldg., Belfast ..	do.
Making-up Road	Tynemouth Corporation	Sands & Walker, Engineers, Milton-chambers, Nottingham	do.
Villa, Helen's Bay, co. Down	Willenden District Council	Draughtsmen's Office at Electricity Works	do.
Sinking a Borehole, Cheddington	Brentford U.D.C.	O. Claude Robson, Dyne-road, Kilburn, N.W.	do.
Extension, Eng. Hse., Elec. Wks., Tanners St., N. Shields	do.	Council's Engineer, Boston-road, Brentford	do.
*Erection of Cottage in Council's Store Yard	do.	do.	do.
*Roadmaking and Paving Works	do.	do.	do.
*Paving Works	do.	do.	do.

Hewett & Sons, Ltd...	5560	4	10	Wilson, Borden, & Co...	£25	14	0
W. J. Wisbey	474	18	10	H. Rutchner	419	37	0
Buxton & Jenner	466	13	0	M. Webb	403	19	10
E. Catton, jun.	464	8	6	J. Jackson	396	1	4
F. W. Marsh	445	5	6	A. E. Rigby, Ashford, Kent	387	2	4
A. Wisbey & Co.	438	17	10				

PONTERFRACT.—For alterations to the Robin Hood Inn, Ponterfract, for Messrs. Beverley Bros., Wakefield. Messrs. Gamble & Pennington, architects, Ponterfract:—

T. Ward, Builder, Ponterfract £303 2 6

PONTYPRIDD.—For sewer extensions, Common-road and Court House-street, Wood-road, Treahod-road, Llantur-road for the Urban District Council. Mr. P. R. A. Willoughby, Engineer and Surveyor, Council Offices, Pontypridd:—

G. Pollard & Co., Ltd., Tanton* .. £585

POOLE.—For the erection of elementary schools at Osedale, Poole, for the Poole Education Committee. Mr. W. Andrew, architect, Parkstone. Quantities by the architect:—

Wilkins & Son.....	£4,638 0 0	Jesty & Baker.....	£3,824 0 10
Chincher & Co.....	4,987 0 0	Burt & Vick	3,797 10 0
Wert & Way	4,329 14 0	W. J. Cross	3,785 12 5
Jenkins & Sons	4,232 0 0	Baker & Pearcy	3,736 0 0
Elwood & Morris	4,088 0 0	S. Brown	3,724 0 0
Miller & George	3,941 2 8	Wilson	3,698 10 0
Harding & F. Hoare	3,923 0 0	W. Leach	3,683 0 0
Sons	3,866 0 0	A. J. Col. Swindon*	3,570 16 8

PRUDHOE.—For erecting five new houses and five new flats at Edgewell Colliery, for Mr. W. Wilkinson. Mr. J. J. Eltringham, architect and surveyor, Bishopley House, Blackhill:—

Wanless & Jeffery, Prudhoe-on-Tyne* .. £2,033 6 9

QUEENSFERRY (Flint).—For cleaning down, scraping, and painting Queensferry (Opening) bridge over River Dee, for the Flintshire County Council. Mr. S. Evans, County Surveyor, County-buildings, Mold:—

T. B. Dean.....	£450 0	W. Merrick	£252 0
T. Mathias & Co.	390 0	R. Peters	230 0
A. Badwick	324 10	E. Blane & Son	1,420 0 0
J. Dowham & Co.	292 10	Connell's Quay*	156 0
J. Davies	255 0		

QUEENSTOWN.—For erecting a house and shop, for Mrs. O'Reilly. Messrs. W. H. Hill & Son, architects, 28, South-mall, Cork:—

Denis Lano, Little Island, Co. Cork* £440

RUDDLIAN.—For 1,850 lineal yds. of stoneware pipe sewers, etc., for the St. Asaph (Flint) Rural District Council. Mr. T. B. Farrington, engineer, Trinity-square, Llandudno:—

F. Marland	£1,838 16 4
Hughes & Williams	1,718 18 0
W. Underwood & Bros.	1,585 0 0
D. Griffiths & Son	1,450 0 0
F. Mitchell & Son	1,420 0 0
G. Read & Son	1,417 13 0
Sheffield, Son, & Evans, 170, Wellington-road, Rhyl*	1,357 10 0
R. L. Roberts	1,215 16 0
Badsey & Rodhouse.....	1,195 6 2 1/2
Hughes & Rowlands	1,139 2 6
G. Roberts Bros.	1,098 0 0

SALTASH.—For alterations and additions to Dunheved House, Saltash, for Mr. Pawley. Mr. E. M. Lees, architect, Devonport:—

J. T. Prooking..... £215 | W. V. Alford £178
B. E. D. Ough..... 184 | W. H. Rothery* 194
[All of Saltash.]

SALTASH.—For alterations and additions to "The Railway Hotel," Saltash, for the Plymouth Breweries, Ltd. Mr. E. M. Lees, architect, Devonport:—

W. V. Alford..... £464 10 | A. R. Smith, Stone-T. May..... 420 0 | house* £399 10

SHEFFIELD.—For alterations to grammar school buildings in order to adapt them for the purposes of a training college for teachers, for the Education Committee. Messrs. Gibbs & Flockton, architects, 15, St. James's-row, Sheffield:—

T. Boper & Sons, Bruce Works, Sheffield £1,855

SOUTH BRENT.—For the construction of water main, etc., for the Totnes Rural District Council. Mr. R. Hansford Worth, engineer, 42, George-street, Plymouth:—

R. Veano, South Brent £244 8 9

TALGARH.—For house and shop at Talgarh. Mr. J. Gunter, F.S.I., Glastbury, South Wales:—
R. Meredith .. £1,115 0 0 | S. Davies..... £935 12 4
W. E. Lewis .. 975 0 0 | J. C. Evans .. 920 0 0
& Co. 930 0 0 | J. Jones .. 840 0 0
T. D. Evans .. 930 0 0 | Talgarh* .. 840 0 0

TIVERTON.—For building addition to Warncombe House, Tiverton, for Sir J. Beathcote Amory:—
Ellis & Son..... £448 10 | Nicka Bros. £335 0
J. Bolcomb .. 385 0 | S. Manning..... 315 0
Parr, Sanders, & Labdon & Sons, Thorne 340 0 | Cullumpton* .. 310 0

TIVERTON.—For re-slating Collipriest House, Tiverton, for Mr. Charles Carew:—
W. Loosemore..... £210 0 | R. Grater & Sons .. £168 0
A. J. Tucker .. 192 0 | Sandars, Thorne, & S. Manning 170 0 | Parr* 159 0
[All of Tiverton.]

TIVERTON.—For building classroom and offices at Elmore School, Tiverton, for the Borough Education Committee:—
C. Saunders .. £313 4 | W. Deering £277 10
S. Manning..... 305 0 | R. Grater & Sons* .. 269 0
W. Loosemore .. 281 0
[All of Tiverton.]

WALTON-ON-THAMES.—For sewerage works in Elmes-road, for the Urban District Council. Mr. R. Wilds, Engineer and Surveyor, Council Offices, Walton-on-Thames:—
G. Willis..... £550 18 6 | Hevett & Sons, A. O. Scan .. 409 9 2 | Ltd. £343 17 3
A. C. Streeter & Co. 399 4 7 | S. Kavanagh & Co. 336 16 0
E. Poterford & Co. 397 0 0 | W. H. Wheeler .. 321 18 5
G. Hebburn .. 364 10 0 | J. Jackson .. 315 12 1
[Surveyor's estimate, £297 16s. 3d.]

WARMISTON.—For erecting a fire-station in the Close-road, for the Fire Brigade. Mr. C. H. Lawton, surveyor, Warmiston:—
A. L. Ponton..... £372 9 | H. Franklin, R. Butcher & Son .. 158 14 | Silver-street* .. £527 0
[Estimate, £535.]

[Materials on the site to the value of £25 to be had free by the contractor employed to carry out the work.]

WOKING.—For laying sewer, levelling, curbing, and formation of new road connecting Chertsey and Maybury roads, Woking. Mr. W. H. Dufiled, surveyor. Quantities supplied:—
Drowley & Co..... £287 | A. Gale..... £541
J. Whitburn..... 628 | S. Kavanagh & Co., G. A. Franks .. 584 | Surbiton* 530

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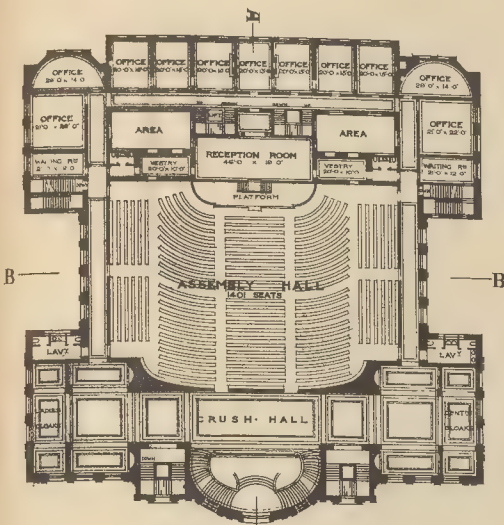
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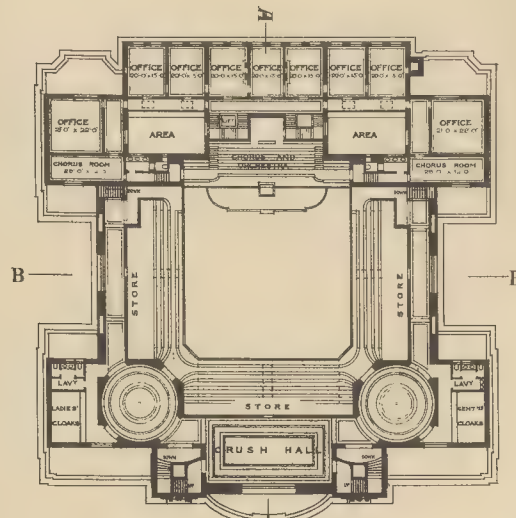
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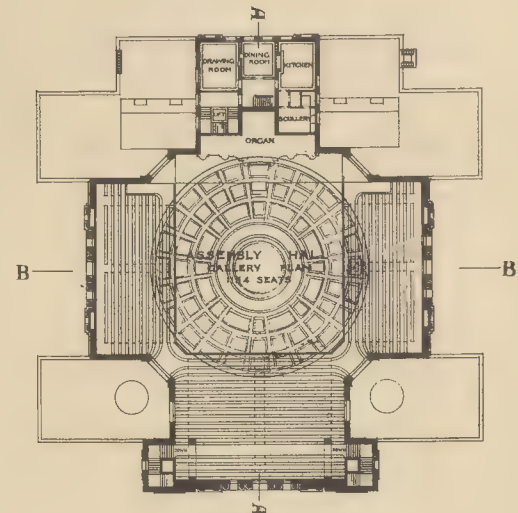
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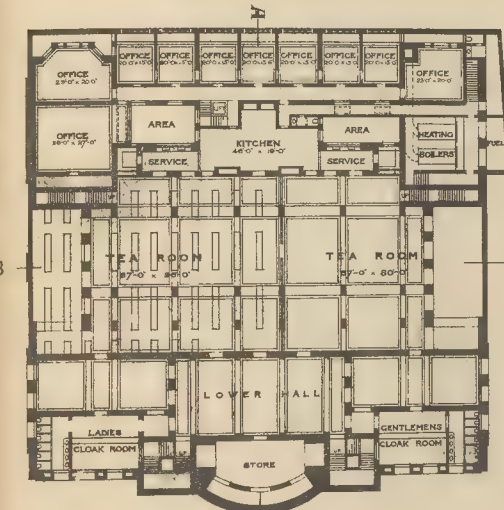
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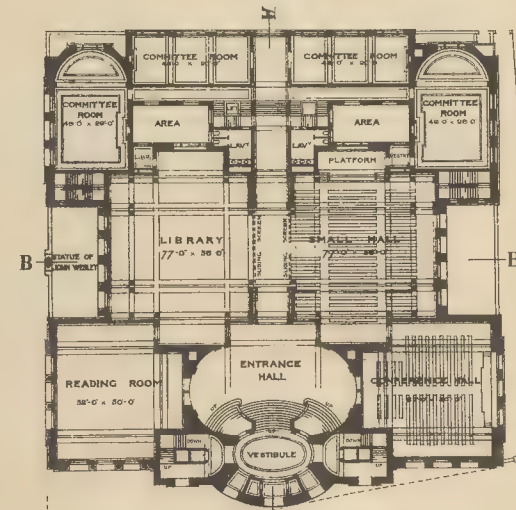
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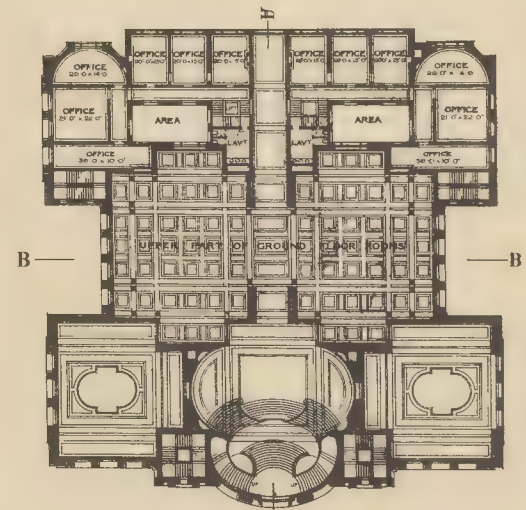
THIRD FLOOR PLAN



BASEMENT PLAN



GROUND PLAN



MEZZANINE ABOVE GROUND FLOOR



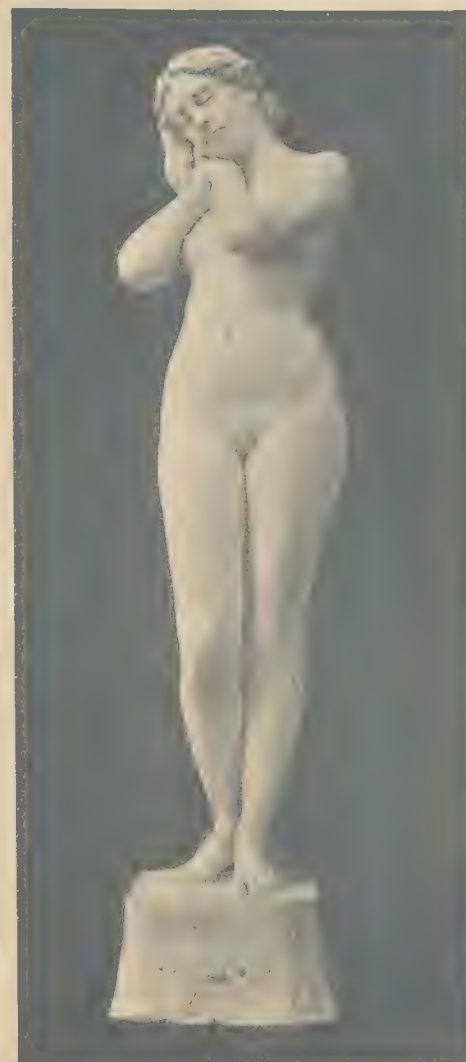
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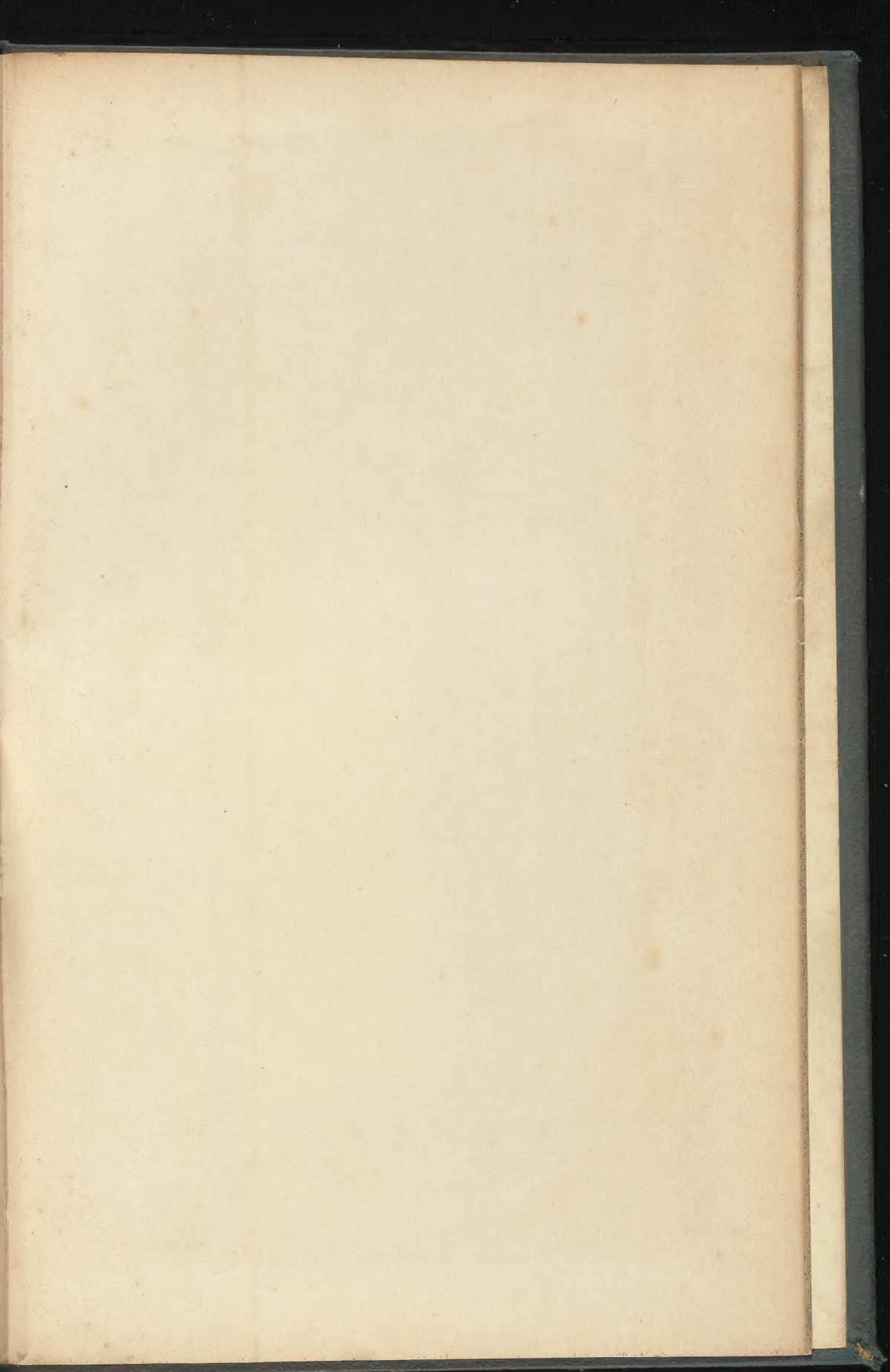
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